

**DRAFT INITIAL STUDY AND
MITIGATED NEGATIVE DECLARATION**

**AVENAL SUBDIVISION
CONSTRUCTION PROJECT
AVENAL, CALIFORNIA**



JANUARY 2020



DRAFT INITIAL STUDY AND
MITIGATED NEGATIVE DECLARATION

**AVENAL CORCORAN AVENUE/KERN
STREET SUBDIVISION CONSTRUCTION
PROJECT**



Prepared for:

Consultant:



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NOTICE OF PUBLIC HEARING AND INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

This is to advise that the City of Avenal has prepared a Mitigated Negative Declaration for the Project identified below that is scheduled to be heard at the City of Avenal City Council Meeting on Thursday, **March 12, 2020**

PLEASE BE ADVISED that the City of Avenal will consider adopting the Mitigated Negative Declaration at the City Councils meeting to be held on March 12, 2020. Presentations will be made at approximately 5:15 p.m. Action on items on the board agenda will occur after the presentations. The meeting will be held in the Avenal Theater, 233 East Kings Street, Avenal, CA 93204.

Project Name

Avenal Corcoran Avenue/Kern Street Subdivision Construction Project.

Project Location

Southeast corner of Kern Street and Corcoran Avenue in Avenal, California.

Project Description

The Alvarado Group (Applicant), with the City of Avenal (City) as Lead Agency has proposed to construct a 122-lot single family residential development (Project) within the City of Avenal in the western portion of Kings County, California. The residential development would occupy approximately 18.65 acres of Accessor's Parcel Number (APN) 038-260-055. The Project would require a General Plan Amendment, zone change, variance, and Tentative Tract Map approval. The Project would also include the construction of an internal circulation network to provide access to the Project site. The site would be accessed from Corcoran Avenue to the west of the Project site. The Project would connect to the City of Avenal's water and sewer systems. The Project will be constructed in phases, with the first phase consisting of grading and site improvements beginning in the first quarter of 2020. The first phase is anticipated to take approximately 8 to 12 months. The second phase consists of home construction and is anticipated to begin during the second quarter of 2020 and take approximately 18 to 24 months.

The Avenal General Plan outlines anticipated population growth through 2035. The construction of the new residential development would serve future residents of Avenal as the population within the City grows.

The document and documents referenced in the Initial Study/Mitigated Negative Declaration are available for review at Avenal City Hall located at 919 Skyline Boulevard, Avenal, CA 93204.

As mandated by the California Environmental Quality Act (CEQA), the public review period for this document was 30 days (CEQA Section 15073[b]). The public review period began on January 17, 2020 and ended on February 16, 2020. For further information, please contact Jaymie Brauer at 661-616-2600 or jaymie.brauer@qkinc.com.

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MITIGATED NEGATIVE DECLARATION

As Lead Agency under the California Environmental Quality Act (CEQA), the City of Avenal (Applicant) reviewed the Project described below to determine whether it could have a significant effect on the environment because of its development. In accordance with CEQA Guidelines Section 15382, “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

Project Name

Avenal Corcoran Avenue/Kern Street Subdivision Construction Project.

Project Location

Southeast corner of Corcoran Avenue and Kern Street, Avenal, CA.

Project Description

The Alvarado Group (Applicant), with the City of Avenal (City) as Lead Agency has proposed to construct a 122-lot single family residential development (Project) within the City of Avenal in the western portion of Kings County, California. The residential development would occupy approximately 18.65 acres of Accessor’s Parcel Number (APN) 038-260-055. The Project would require a General Plan Amendment, zone change, variance, and Tentative Tract Map approval. The Project would also include the construction of an internal circulation network to provide access to the Project site. The site would be accessed from Corcoran Avenue to the west of the Project site. The Project would connect to the City of Avenal’s water and sewer systems. The Project will be constructed in phases, with the first phase consisting of grading and site improvements and beginning in the first quarter of 2020. The first phase is anticipated to take approximately 8 to 12 months. The second phase consists of home construction and is anticipated to begin during the second quarter of 2020 and take approximately 18 to 24 months.

The document and documents referenced in the Initial Study/Mitigated Negative Declaration are available for review at Avenal City Hall located at 919 Skyline Boulevard, Avenal, CA 93204.

As mandated by the California Environmental Quality Act (CEQA), the public review period for this document was 30 days (CEQA Section 15073[b]). The public review period began on January 17, 2020 and ended on February 16, 2020. For further information, please contact Jaymie Brauer at 661-616-2600 or jaymie.bruaer@qkinc.com.

Mailing Address and Phone Number of Contact Person

City of Avenal
919 Skyline Boulevard
Avenal, CA 93204
Contact Person: Fernando Santillan
Phone: (559) 386-5776

Findings

As Lead Agency, the City finds that the Project will not have a significant effect on the environment. The Environmental Checklist (CEQA Guidelines Appendix G) or Initial Study (IS) (*see Section 3 - Environmental Checklist*) identified one or more potentially significant effects on the environment, but revisions to the Project have been made before the release of this Mitigated Negative Declaration (MND) or mitigation measures would be implemented that reduce all potentially significant impacts less than significant levels. The Lead Agency further finds that there is no substantial evidence that this Project would have a significant effect on the environment.

Mitigation Measures Included in the Project to Avoid Potentially Significant Effects

MM BIO-1: Prior to initial ground disturbing activities, a qualified wildlife biologist shall conduct a biological clearance survey 14- 30 calendar days prior to the onset of construction. The clearance survey shall include walking transects to identify presence of San Joaquin kit fox or diagnostic signs of that species (e.g., dens, tracks, prey remains), and other special-status species or protected species including but not limited to American badger, Western burrowing owl, etc. A report outlining the results of the survey shall be submitted to the Lead Agency.

If a known, active, or natal kit fox den is discovered during the clearance survey, the appropriate buffers shall be established using fencing or flagging as follows: (1) at least 50 feet around potential or atypical (any manmade structure such as pipes, culverts, and diggings below concrete slabs, that may be occupied by San Joaquin kit fox) den(s) and (2) at least 100 feet around known den(s). The United States Fish and Wildlife Service (USFWS) must be contacted for further guidance if a natal den is discovered. Buffer zones shall be considered Environmentally Sensitive Areas (ESAs) and no ground disturbing activities shall be allowed within a buffer area. The USFWS and California Department of Fish and Wildlife (CDFW) shall be contacted upon the discovery of any natal or pupping dens.

Potential kit fox dens may be excavated provided that the following conditions are satisfied: (1) the den has been monitored for at least five consecutive days and is deemed unoccupied by a qualified biologist; (2) the excavation is conducted by or under the direct supervision of a qualified biologist. Den monitoring and excavation should be conducted in accordance with the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (United States Fish and Wildlife Service, 2011).

MM BIO-2: Prior to ground disturbance activities, or within one week of being deployed at the Project site for newly hired workers, all construction workers at the Project site shall attend a Construction Worker Environmental Awareness Training and Education Program, developed and presented by a qualified biologist.

The Construction Worker Environmental Awareness Training and Education Program shall be presented by the biologist and shall include information on the life history wildlife and plant species that may be encountered during construction activities, their legal protections, the definition of “take” under the Endangered Species Act, measures the Project operator is implementing to protect the species, reporting requirements, specific measures that each worker must employ to avoid take of the species, and penalties for violation of the Act. Identification and information regarding special-status or other sensitive species with the potential to occur on the Project site shall also be provided to construction personnel. The program shall include:

- An acknowledgement form signed by each worker indicating that environmental training has been completed.
- A copy of the training transcript and/or training video/CD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms shall be maintain on site for the duration of construction activities.

MM BIO-3: If all Project activities are completed outside of the Swainson’s hawk nesting season (February 15 through August 31), this mitigation measure shall need not be applied. If construction is planned during the nesting season, a preconstruction survey shall be conducted by a qualified biologist to evaluate the site and a 0.5-mile buffer around the site for active Swainson’s hawk nests. If potential Swainson’s hawk nests or nesting substrates occur within 0.5 mile of the Project site, then those nests or substrates must be monitored for Swainson’s hawk nesting activity on a routine and repeating basis throughout the breeding season, or until Swainson’s hawks or other raptor species are verified to be using them. Monitoring shall be conducted according to the protocol outlined in the *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (Swainson’s Hawk Technical Advisory Committee 2000). The protocol recommends that ten visits be made to each nest or nesting site: one during January 1-March 20 to identify potential nest sites, three during March 20-April 5, three during April 5-April 20, and three during June 10-July 30. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to Project-related ground disturbance activities. During the nesting period, active Swainson’s hawk nests shall be avoided by 0.5 mile unless this avoidance buffer is reduced through consultation with the CDFW and/or USFWS. If an active Swainson’s hawk nest is located within 500 feet of the Project or within the Project site, the Project proponent shall contact CDFW for guidance.

MM BIO-4: A qualified biologist shall conduct a pre-construction survey on the Project site and within 500 feet of its perimeter, where feasible, to identify the presence of the western burrowing owl. The survey shall be conducted between 14 and 30 days prior to the start of construction activities. If any burrowing owl burrows are observed during the

preconstruction survey, avoidance measures shall be consistent with those included in the CDFW staff report on burrowing owl mitigation (CDFG 2012). If occupied burrowing owl burrows are observed outside of the breeding season (September 1 through January 31) and within 250 feet of proposed construction activities, a passive relocation effort may be instituted in accordance with the guidelines established by the California Burrowing Owl Consortium (1993) and the California Department of Fish and Wildlife (2012). During the breeding season (February 1 through August 31), a 500-foot (minimum) buffer zone should be maintained unless a qualified biologist verifies through noninvasive methods that either the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

MM BIO-5: If construction is planned outside the nesting period for raptors (other than the western burrowing owl) and migratory birds (February 15 to August 31), no mitigation shall be required. If construction is planned during the nesting season for migratory birds and raptors, a preconstruction survey to identify active bird nests shall be conducted by a qualified biologist to evaluate the site and a 250-foot buffer for migratory birds and a 500-foot buffer for raptors. If nesting birds are identified during the survey, active raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified on-site monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season.

No construction or earth-moving activity shall occur within a non-disturbance buffer until it is determined by a qualified biologist that the young have fledged (left the nest) and have attained sufficient flight skills to avoid Project construction areas. Once the migratory birds or raptors have completed nesting and young have fledged, disturbance buffers will no longer be needed and can be removed, and monitoring can cease.

MM BIO-6: During all construction-related activities, the following mitigation shall apply:

- a. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from the construction or Project site.
- b. Construction-related vehicle traffic shall be restricted to established roads and predetermined ingress and egress corridors, staging, and parking areas. Vehicle speeds should not exceed 20 miles per hour (mph) within the Project site.
- c. To prevent inadvertent entrapment of kit fox or other animals during construction, the contractor shall cover all excavated, steep-walled holes or trenches more than two feet deep at the close of each workday with plywood or similar materials. If holes or trenches cannot be covered, one or more escape ramps constructed of earthen fill or wooden planks shall be installed in the trench. Before such holes or trenches are filled, the contractor shall thoroughly inspect

- them for entrapped animals. All construction-related pipes, culverts, or similar structures with a diameter of four-inches or greater that are stored on the Project site shall be thoroughly inspected for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If at any time an entrapped or injured kit fox is discovered, work in the immediate area shall be temporarily halted and USFWS and CDFW shall be consulted.
- d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of four-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
 - e. No pets, such as dogs or cats, shall be permitted on the Project sites to prevent harassment, mortality of kit foxes, or destruction of dens.
 - f. Use of anti-coagulant rodenticides and herbicides in Project areas shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional Project-related restrictions deemed necessary by the USFWS and CDFW. If rodent control must be conducted, zinc phosphide shall be used because of the proven lower risk to kit foxes.
 - g. A representative shall be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS.
 - h. The Sacramento Fish and Wildlife Office of USFWS and CDFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFW contact can be reached at ~~1701~~(559) 243-4014 and R4CESA@wildlifeca.gov.
 - i. All sightings of the San Joaquin kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to the Service at the address below.
 - j. Any Project-related information required by the USFWS or questions concerning the above conditions, or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at: Endangered Species Division, 2800 Cottage Way,

Suite W 2605, Sacramento, California 95825-1846, phone (916) 414-6620 or (916) 414-6600.

- k. If burrowing owl are found to occupy the Project site and avoidance is not possible, burrow exclusion may be conducted by qualified biologists only during the non-breeding season, before breeding behavior is exhibited, and after the burrow is confirmed empty through non-invasive methods (surveillance). Replacement or occupied burrows shall consist of artificial burrows at a ratio of 1 burrow collapsed to 1 artificial burrow constructed (1:1). Ongoing surveillance of the Project site during construction activities shall occur at a rate sufficient to detect Burrowing owl, if they return.

MM CUL-1: a) If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. A copy of all actions shall be submitted to the Lead Agency.

b) If requested by a Native American tribal group, the Project developer shall have a Native American monitor on site during initial ground disturbance activities.

MM CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the NAHC, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

MM GEO-1: Prior to issuing of grading or building permits, the Project applicant shall submit to the City 1) the approved Storm Water Pollution Prevention Plan (SWPPP) and 2) the Notice of Intent (NOI) to comply with the General National Pollutant Discharge Elimination System (NPDES) from the Central Valley Regional Water Quality Control Board. The requirements of the SWPPP and NPDES shall be incorporated into design specifications and construction contracts. Recommended best management practices for the construction phase may include the following:

1. Stockpiling and disposing of demolition debris, concrete, and soil properly;
2. Protecting existing storm drain inlets and stabilizing disturbed areas;

3. Implementing erosion controls;
4. Properly managing construction materials; and
5. Managing waste, aggressively controlling litter, and implementing sediment controls.
6. Evidence of an approved SWPPP shall be submitted to the Lead Agency.

MM GEO-2: Prior to issuing of grading or building permits, a registered Geotechnical engineer and structural engineer shall be hired to oversee the construction of the Project. A final geotechnical analysis of the site shall be prepared, and site preparation and construction requirements shall be outlined. The final Geotechnical Report and any recommendations made by the Registered Geotechnical Engineer and/or Structural Engineer shall be reviewed and approved by the Lead Agency prior to the start of grading or construction. These include but are not limited to:

1. Earthwork in accordance with Appendix J of the 2016 CBC.
2. Removal of vegetation, organic rich soils (>2%) from the grading area.
3. Over-excavation of subgrade in areas of planned buildings, building pads, asphalt pavement or concrete flatwork.
4. Review of over-excavation/scarification by a registered Geotechnical engineer.
5. Removal of expansive soils with the replacement of non-expansive soils.
6. Use of lime treatment on expansive soils in lieu of removal/replacement of soils.
7. Inspection of imported fill materials to meet specific criteria regarding particle size, maximum expansion, plasticity, minimum R-value of 45 (in paved areas), soluble sulfates and chlorides and soil resistivity.
8. The use of bedding material such as sand to protect buried utilities and pipes.
9. Retaining structures shall be designed to resist a lateral active earth pressure of 40 pcf.
10. The use of spread footings and/or continuous wall footings shall be utilized, as recommended by the registered Geotechnical engineer or Structural Engineer.
11. Light poles, signs or canopies shall be designed with in accordance with Section 1807.2 of the 2016 CBC.
12. The Registered Geotechnical Engineer and/or Structural Engineer shall be on to observe all construction activities as is deemed necessary.
13. Concrete floors shall be a minimum four inches in thickness. Reinforcement of concrete slab-on-grade floors shall include at least #3 bars spaced 24 inches on center in both directions. Moisture vapor retarder/barrier shall be installed beneath all slabs-on-grade that would be covered with flooring materials such as vinyl, linoleum,

wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist.

14. Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls.
15. Backdrains should be installed behind all retaining walls exceeding 3 feet in height.
16. Use of alternate combinations of cementitious materials shall be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.
17. Buried metal conduits shall have a protective coating in accordance with the manufacturer's specifications. A corrosion specialist shall be consulted if more detailed recommendations are required.
18. Prior to paving, the subgrade shall be prepared in at a minimum:
 - a. The upper 8 inches of subgrade soils shall be compacted to at least 95% relative compaction.
 - b. All aggregate base (AB) courses shall be moisture conditioned to within 2% of optimum moisture content and shall be compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements shall be specified by the Project Civil Engineer.
19. Other requirements based on the professional judgement of the Registered Geotechnical Engineer and/or Structural Engineer.

MM-GEO-3 Prior to the issuance of grading or building permits, the Project Geotechnical Engineer, Structural Engineer Civil Engineer, General Contractor, the Earthwork Contractor shall meet with the Lead Agency to discuss the grading plan and grading requirements as outlined in the final Geotechnical Report.

MM GEO-4 During construction activities, the geotechnical engineer shall provide observation and testing during the following stages of grading:

1. During the clearing and grubbing of the site.
2. During the demolition of any existing structures, buried utilities or other existing improvements.
3. During excavation and over-excavation of existing subgrade.
4. During all phases of grading including ground preparation and filling operations.
5. When any unusual conditions are encountered during grading.

6. A grading and compaction report summarizing conditions encountered during grading and the in-place density testing that was performed shall be submitted upon completion of the earthwork construction. A copy of this report shall be submitted to the Lead Agency.

MM GEO-5 After the completion of grading, the geotechnical engineer shall provide additional observation and testing during the following construction activities:

1. During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
2. After excavation and prior to placement of reinforcing steel or concrete within footing excavations to verify that footings are properly founded in competent materials.
3. During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
4. When any unusual ground or soil conditions are encountered during construction

MM GEO-6: If any paleontological resources are encountered during ground disturbance activities, all work within 25 feet of the find shall halt until a qualified paleontologist as defined by the Society of Vertebrate Paleontology Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (2010), can evaluate the find and make recommendations regarding treatment. Paleontological resource materials may include resources such as fossils, plant impressions, or animal tracks preserved in rock. The qualified paleontologist shall contact the Natural History Museum of Los Angeles County or other appropriate facility regarding any discoveries of paleontological resources.

If the qualified paleontologist determines that the discovery represents a potentially significant paleontological resource, additional investigations and fossil recovery may be required to mitigate adverse impacts from Project implementation. If avoidance is not feasible, the paleontological resources shall be evaluated for their significance. If the resources are not significant, avoidance is not necessary. If the resources are significant, they shall be avoided to ensure no adverse effects, or such effects must be mitigated. Construction in that area shall not resume until the resource appropriate measures are recommended or the materials are determined to be less than significant. If the resource is significant and fossil recovery is the identified form of treatment, then the fossil shall be deposited in an accredited and permanent scientific institution. Copies of all correspondence and reports shall be submitted to the Lead Agency.

MM HAZ-1: In the event that other abandoned or un-recorded wells are uncovered or damaged during excavation or grading activities, all work shall cease and the California Department of Conservation, Division of Oil, Gas and Geothermal Resources shall be contacted for requirements and approvals. The California Department of Conservation, Division of Oil, Gas and Geothermal Resources may determine that remedial plugging operations may be required. All correspondence shall be submitted to the Lead Agency.

MM HAZ-2: Prior to the issuance of grading or building permits, the Project developer shall pay \$1,942.51 for every single family unit being built in compliance with the Kings County Adopted Public Facilities Fees to offset the increased costs associated with the provision of additional Fire Protection services.

MM NSE-1: During construction, the contractor shall situate implement the following measures:

1. All stationary construction equipment on the Project site shall be located so that noise emitting objects or equipment faces away from any potential sensitive receptors.
2. The construction contractor shall ensure that all construction equipment is equipped with manufacturer-approved mufflers and baffles During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.
3. Noise associated with construction activities shall take place during daylight hours, when feasible.

MM PUB-1: Prior to the issuance of grading or building permits, the Project developer shall pay \$1,147.99 in Public Protection fees per each single-family home built as required by Kings County Adopted Public Facilities Fees.

MM PUB-2: Prior to the issuance of grading or building permits, the Project developer shall comply with both the City of Avenal School Developer Fees requirement and Ordinance No. 86-01. No fees shall be imposed on development covered by this ordinance where at the time of the issuance of a building permit, the building official of the City of Avenal shall have on file a letter from the superintendent of the Reef Sunset Unified School District stating that an agreement or arrangement between the developer and the School District has been reached offsetting any impacts from the Project.

MM PUB-3: Prior to the issuance of grading or building permits, the Project developer shall pay City of Avenal Park Impact Fees. The developer shall pay a flat fee of \$1,501.47 for parks, parks facilities, amenities and equipment for parks in Avenal.

MM PUB-4: Prior to the issuance of grading or building permits, the Project developer must pay City of Avenal General Government Impact Fees. The developer shall pay \$752.67 per each housing unit built. Evidence of payment shall be submitted to the Avenal Community Development Department.

MM PUB-5: The Project developer shall pay City of Avenal Park General Government Impact Fees to the City of Avenal. The developer shall pay \$752.67 per each housing unit being built.

SECTION 1 - INTRODUCTION

1.1 - Overview

The City of Avenal is proposing to construct a 122-unit housing subdivision (Project) within the city of Avenal in Kings County in the San Joaquin Valley, California. Figure 1-1 is a map of the regional location and Figure 1-2 shows the aerial location of the Project site.

1.2 - California Environmental Quality Act

The City of Avenal is the Lead Agency for this Project pursuant to the CEQA Guidelines (Public Resources Code Section 15000 et seq.). The Environmental Checklist (CEQA Guidelines Appendix G) or Initial Study (IS) (see *Section 3 – Initial Study*) provides analysis that examines the potential environmental effects of the construction and operation of the Project. Section 15063 of the CEQA Guidelines requires the Lead Agency to prepare an IS to determine whether a discretionary Project will have a significant effect on the environment. A Mitigated Negative Declaration (MND) is appropriate when an IS has been prepared and a determination can be made that no significant environmental effects will occur because revisions to the Project have been made or mitigation measures will be implemented that reduce all potentially significant impacts to less than significant levels. The content of an MND is the same as a Negative Declaration, with the addition of identified mitigation measures and a Mitigation Monitoring and Reporting Program (MMRP) (see *Section 6 – Mitigation Monitoring and Reporting Program*).

Based on the IS, the Lead Agency has determined that the environmental review for the proposed application can be completed with an MND.

1.3 - Impact Terminology

The following terminology is used to describe the level of significance of impacts.

- A finding of “no impact” is appropriate if the analysis concludes that the Project would not affect a topic area in any way.
- An impact is considered “less than significant” if the analysis concludes that it would cause no substantial adverse change to the environment and requires no mitigation.
- An impact is considered “less than significant with mitigation incorporated” if the analysis concludes that it would cause no substantial adverse change to the environment with the inclusion of environmental commitments that have been agreed to by the applicant.
- An impact is considered “potentially significant” if the analysis concludes that it could have a substantial adverse effect on the environment.

1.4 - Document Organization and Contents

The content and format of this IS/MND is designed to meet the requirements of CEQA. The report contains the following sections:

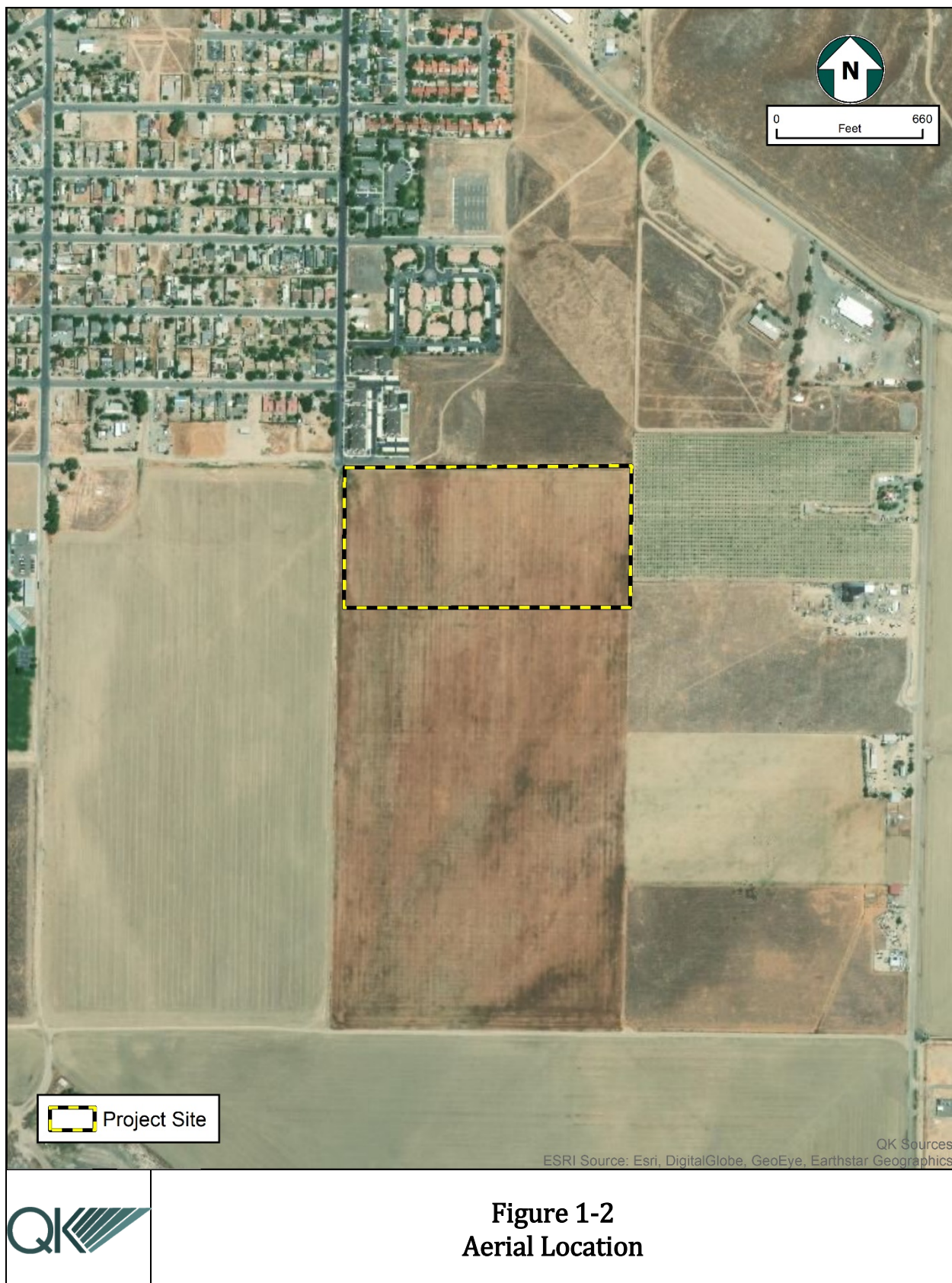
- *Section 1 – Introduction:* This section provides an overview of CEQA requirements, intended uses of the IS/MND, document organization, and a list of regulations that have been incorporated by reference.
- *Section 2– Project Description:* This section describes the Project and provides data on the site's location.
- *Section 3 – Initial Study:* This section contains the evaluation of 21 different environmental resource factors contained in Appendix G of the CEQA Guidelines. Each environmental resource factor is analyzed to determine whether the proposed Project would have an impact. One of four findings is made which include: no impact, less than significant impact, less than significant with mitigation, or significant and unavoidable. If the evaluation results in a finding of significant and unavoidable for any of the 21 environmental resource factors, then an Environmental Impact Report will be required.
- *Section 4 – List of Preparers:* This section identifies the individuals who prepared the IS/MND.
- *Section 5 – Bibliography:* This section contains a full list of references that were used in the preparation of this IS/MND.
- *Section 6 – Mitigation Monitoring and Reporting Program:* This section contains the Mitigation Monitoring and Reporting Program.

1.5 - Incorporated by Reference

The following documents and/or regulations are incorporated into this IS/MND by reference:

- City of Avenal General Plan 2025;
- City of Avenal General Plan Enhancement IS/MND (2018)
- City of Avenal Zoning Ordinance;
- City of Avenal USBR Water Management Plan (2016);
- Kings County General Plan EIR;
- 2015 Kings County Emergency Operations Plan (2015)
- California Title 24 Code of Regulations (2019)





SECTION 2 - PROJECT DESCRIPTION

2.1 - Introduction

The City of Avenal (City, as Lead Agency) is proposing to construct a 122-lot single family residential development (Project) within the City of Avenal in the western portion of Kings County, California. Figure 1-1 shows the Project's regional location and Figure 1-2 shows the aerial location of the Project site.

2.2 - Project Location

The Project site is located within Section 22, Township 22 South, Range 17 East, Mount Diablo Base and Meridian (MDB&M), within the Kettleman Plain U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The site encompasses approximately 18.65-acre portion of Assessor's Parcel Number (APN) 038-260-055. The Project site is located on the southeast corner of Corcoran Avenue and Kern Street.

2.3 - Project Environment

The site was historically used for agricultural purposes and is currently used as to graze cattle. The site is bordered by plowed farmland property on the west, orchards to the east, cow pastures to the south, and multi-family residential development to the north. Single family residences are located approximately 500 feet northwest of the Project site.

Police and fire service will be served by the City of Avenal and/or the County of Kings. The Project will connect to the existing sewer system. The nearest sewer line connection is to the immediate north of the Project site. The Project would tie into the existing water line system. Water will be provided by the City of Avenal, and sanitation/garbage collection will be provided by Mid Valley Disposal with waste being deposited at Avenal Landfill.

The City of Avenal General Plan (General Plan) outlines an anticipated population growth to approximately 16,050 persons through 2035. The US Census estimated the 2018 City population to be 13,218 persons. Construction of the new residential development would serve future residents of Avenal in accordance with the growth anticipated by the General Plan.

2.4 - Proposed Project

The proposed Project consists of a General Plan Amendment, zone change, zone variance, and Tentative Tract Map to allow for the development of a 122-lot subdivision on an approximately 18.65-acre, parcel Assessor's Parcel Number (APN) 038-260-055. The proposed General Plan Amendment would change the land use designation from the existing Community Commercial (CC), High Density Residential (R3), and Park (O) designations to Single Family Residential (R1). The proposed zone variance would allow for the single-family residential lots to be reduced from 6,000 square feet (sf) to 5,000 sf.

The site would be primarily accessed from Corcoran Avenue on the western Project boundary. The residential development would connect to the City of Avenal's water and sewer systems.

The Project is anticipated to begin construction in Q2 2020. It is anticipated that site improvements will take between eight and 12 months to complete, and home construction activities will take between 18 and 24 months.

The following equipment may be used during construction include:

- 12 CY & 20 CY Scrapers
- Motor Graders (Blades)
- Vibratory and Static Compactors (Sheep's Foot & Smooth Drum)
- 3500 Gallon Water Trucks
- Track Excavators and Rubber Tired Backhoes
- Rubber-Tired Loaders
- 12 CY Concrete Trucks
- Concrete Extrusion Machine

SECTION 3 - INITIAL STUDY

3.1 - Environmental Checklist

1. Project Title:

Avenal Corcoran Avenue/Kern Street Subdivision Construction Project

2. Lead Agency Name and Address:

City of Avenal
919 Skyline Blvd.
Avenal, CA 93204

3. Contact Person and Phone Number:

Fernando Santillan

(559) 386-5782

4. Project Location:

Southeast corner of South Corcoran Avenue and Kern Street, Avenal, CA.

5. General Plan Designation:

Community Commercial (CC), Park (O) and High Density Multi-Family Residential (R3)

6. Zoning:

Community Commercial (CC), Park (O) and High Density Multi-Family Residential (R3)

7. Description of Project:

Please See Section 2.4.

8. Surrounding Land Uses and Setting:

Single-Family Residential and Apartments to the north, Agricultural cultivation to the west and south and east.

9. Other Public Agencies Whose Approval May be Required:

- Central Valley Regional Water Quality Control Board;
- San Joaquin Valley Air Pollution Control District;

3.2 - Environmental Factors Potentially Affected

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

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

3.3 - Determination

On the basis of this initial evaluation:

- ☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR

or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Signature

Date

Printed Name

For

3.4 - Evaluation of Environmental Impacts

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

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

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.1 - AESTHETICS

Except as provided in Public Resources Code Section 21099, would the Project:

a.	Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	In non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Impact #3.4.1a – Would the Project have a substantial adverse effect on a scenic vista?

The proposed Project site is located in an area characterized by flat, undeveloped land that has been historically used for agricultural production. The area to the north is residential development. No known aesthetic resources exist on or near the site. The site is not within or in the vicinity of a city, County, or State identified scenic vista. The Project does not lie near or within a State Designated or Eligible State Scenic Highway (California Department of Transportation, 2011) Furthermore, development of the Project would not block or preclude views to any area containing important or what would be considered visually appealing landforms. The Project does not include the removal of trees determined to be scenic or of scenic value, the destruction of rock outcroppings or degradation of any historic building(s). Therefore, no scenic resources or vistas that will be affected. The Project will not result in development that is substantially different than surrounding land uses.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.1b – Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

See Impact #3.4.1a, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.1c – In non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?

The Project is in an area that is predominantly residential with multi- and single-family residential development to the north, and undeveloped lands to the east, south and west. The Project would be visible from passing motorists and the surrounding residential communities. Changes to the visual quality and character of the Project site will be similar in nature to the nearby residential development. The Project would also include landscaping that would reduce the visual impact of the subdivision. The Project's appearance would not substantially degrade the visual character of the site and would be similar to the nearby existing residential development. Therefore, the Project would result in a less than significant impact to the visual quality of the area.

See also discussion of Impact #3.4.1a, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.1d – Would the Project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Construction of the proposed Project would generally occur during daytime hours, typically from 7:00 a.m. to 6:00 p.m. All lighting would be directed downward and shielded to focus

illumination on the desired work areas only and prevent light spillage onto adjacent properties. Because lighting used to illuminate work areas would be shielded, focused downward, and turned off by 6:00 p.m., the potential for lighting to affect any residents adversely is minimal. Increased truck traffic and the transport of construction materials to the Project site would temporarily increase glare conditions during construction. However, this increase in glare would be minimal. Construction activity would focus on specific areas on the sites, and any sources of glare would not be stationary for a prolonged period of time. Therefore, construction of the proposed Project would not create a new source of substantial glare that would affect daytime views in the area.

The Project will include standard lighting for streetlights, pathways, and outdoor spaces, and will comply with Chapter 9.19 Section N, Residential District Specific Standards and Chapter 9.79.06 Section H, *Property Maintenance Standards for Developed Properties* of the Avenal Zoning Ordinance, which outlines standards for lighting, including the requirement that all outdoor lights be shielded and directed to shine where the lights are located, and not directly on other property or any public right-of-way (City of Avenal, 2018b). The Project exterior street lights and residential lighting will be designed to minimize reflective glare and light scatter. These requirements would substantially reduce potential nuisances from light or glare. Compliance with Sections 9.19 and 9.79.6 of the Avenal Zoning Ordinance and other applicable State or local development standards, the proposed Project would not create new sources of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.2 - AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with existing zoning for agricultural use or a Williamson Act Contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Impact #3.4.2a – Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?

The proposed Project would convert approximately 18.65 acres of pastureland to accommodate the development of a residential subdivision. In order to determine whether this conversion would result in a significant impact on farmland, several factors must be considered. These factors include the quality of the land being converted, the availability of water to supply farming activities on the land, and the type of use being proposed on the agricultural land. CEQA uses the California Department of Conservation Division of Land Resource Protection's Farmland Mapping Project (FMMP) categories of "Prime Farmland," "Farmland of Statewide Importance," and "Unique Farmland" to define "agricultural land" for the purposes of assessing environmental impacts (PRC Section 21060.1(a)). The Project site is designated as Grazing Land the FMMP (Figure 3.4.2-1) (CA Department of Conservation, 2016).

The Project is not designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. Additionally, the Project and surrounding area is currently zoned for non-agricultural uses, and as such would have been previously analyzed when the land was originally converted. Therefore, there would be no impact from the conversion of 18.65 acres of grazing land to a non-agricultural use.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.2b – Would the Project conflict with existing zoning for agricultural use or a Williamson Act Contract?

The Project site is currently zoned for Community Commercial (CC), High Density Multi-Family Residential (R3) and Park (O) and is not subject to a Williamson Act land use contract (see Figure 3.4.2-2). The proposed Project includes a General Plan Amendment and zone change that would change the General Plan land use and zoning from the existing designations into Single Family Residential (R1). As shown in Figure 3.4.2-1, parcels adjacent to the eastern Project site boundary are subject to Williamson Act contracts. However, construction activities will be restricted within the Project site boundary and will not anticipated to impact these parcels. Therefore, the construction of the Project would not result in a conflict with existing zoning for agricultural use or a Williamson Act contract.

See also Impact 3.4.2a.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.2c – Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

The Public Resources Code Section 12220 (g) and Section 4526 defines “Forest land” as land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. There are no forest lands identified on the Project site or within its vicinity; therefore, there would be no conflict with or impacts to zoning for forest land or timber land. The Project would not result in the loss or conversion of forest land to a non-forest use.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.2d – Would the Project result in the loss of forest land or conversion of forest land to non-forest use?

See discussion of Impact #3.4.2c, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.2e – Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

See discussion of Impacts #3.4.2a, #3.4.2b, and #3.4.2c, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

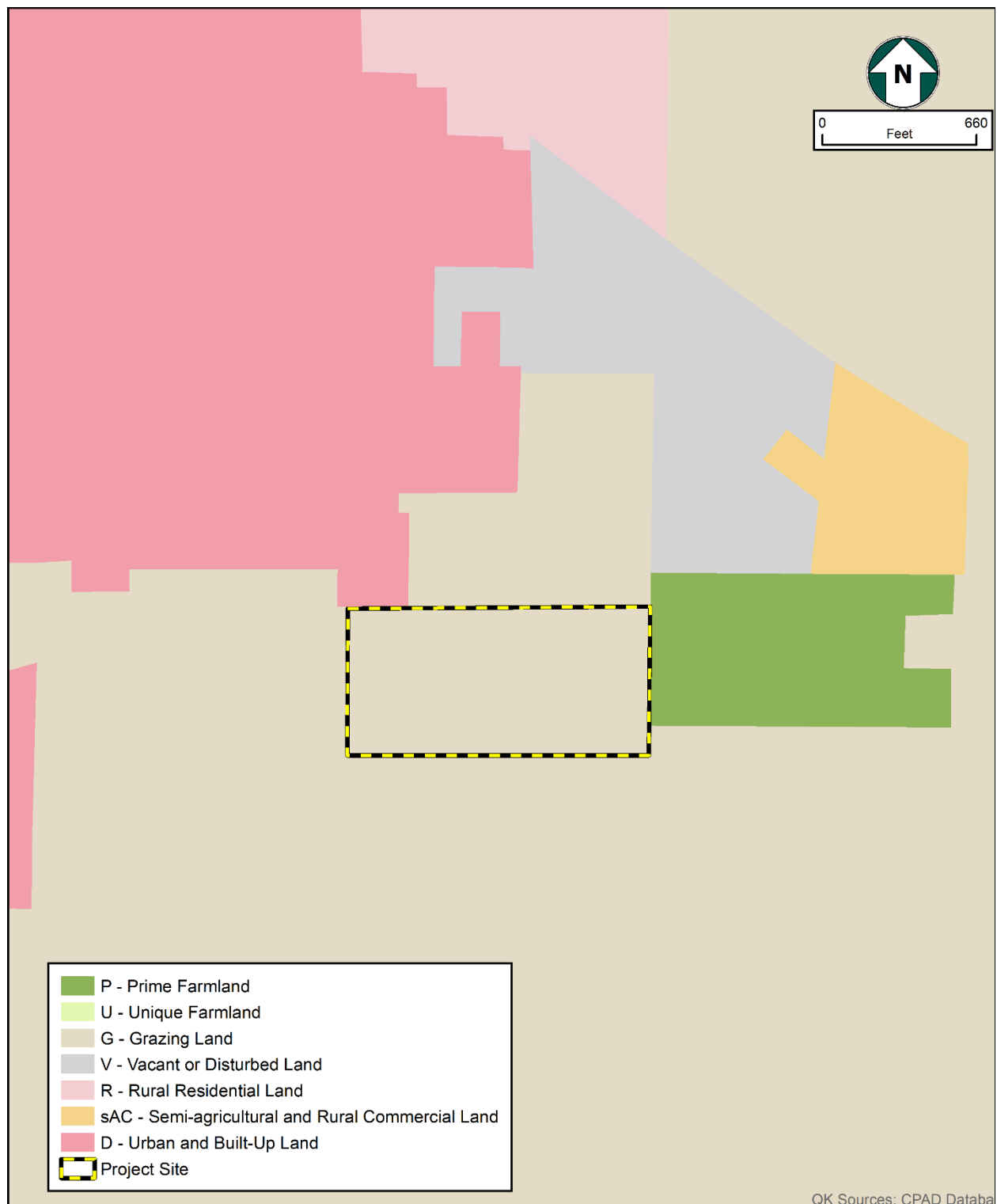


Figure 3.4.2-1
Farmland Mapping and Monitoring Program (FMMP)



Figure 3.4.2-2
Williamson Act Land Use Contract

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.3 - AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:

a.	Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	Result in other emissions (such as those leading to odor) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

A Small Project Analysis Level Assessment (SPAL) was prepared for the Project (Insight Environmental, 2019), and is included as Appendix A.

Impact #3.4.3a – Would the Project Conflict with or obstruct implementation of the applicable air quality plan?

The Project is within the San Joaquin Valley Air Basin (SJVAB) and under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Using Project type and size categories, the SJVAPCD has pre-quantified emissions and determined a size below which it is reasonable to conclude that a project would not exceed applicable thresholds of significance for criteria pollutants. This Project was determined to qualify as under the Small Project Analysis Level (SPAL).

As noted, the Project proposes to construct a 122-lot single family residential development. The Project was assessed pursuant to, the SJVAPCD's *Guide to Mitigating and Assessing Air Quality Impacts* (GAMAQI), the CEQA (PRC 21000–21189), and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000–15387). The SJVAPCD created the SPAL screening tool to streamline air quality assessments of commonly encountered projects. According to the GAMAQI, the SJVAPCD “pre-calculated the emissions on a large number and types of projects to identify the level at which they have no possibility of exceeding the emissions thresholds” (Insight Environmental, 2019).

The SJVAPCD SPAL process established review parameters to determine whether a project qualifies as a “small project.” A project that is found to be “less than” the established parameters has “no possibility of exceeding criteria pollutant emissions thresholds” (Insight Environmental , 2019).

As seen in Table 3.4.3-1 the Project does not exceed the established SPAL limits for a single family residential project.

Table 3.4.3-1: SPAL Project Analysis Level in Units for Residential

Land Use Category - Housing	Project Size (Units)*
Single Family	390
Apartments, Low Rise	590
Apartments, High Rise	600
Condominiums, General	590
Condominiums, High Rise	590
Mobile Homes	760
Retirement Community	880
Proposed Project – Single Family	122
SPAL Exceeded?	No
Note: * Project size based on SPAL Table 5-3(a) as posed on SJBAPCD webpage: http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI-SPAL.pdf	

Source: (Insight Environmental , 2019)

Therefore, the Project will not exceed the established SPAL threshold. As indicated in the SJVAPCD GAMAQI, projects that fall within the SPAL analysis levels are “deemed to have a less than significant impact on air quality due to criteria pollutant emissions and as such are excluded from quantifying criteria pollutant emissions for CEQA purposes.

Based on the above analysis, the proposed Project does not have the possibility of exceeding the criteria pollutant emissions threshold and is under the reporting limit for recommendations and guidelines emissions estimates prepared pursuant to the SPAL assessment. The Project does not conflict with or obstruct implementation of an applicable air quality plan or exceed the SJVAPCD’s established emissions thresholds and significance thresholds for all CEQA air quality determinations. Therefore, this Project would not pose a significant impact to the San Joaquin Valley Air Basin. The proposed Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.3b – Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The CEQA Guidelines indicate that a significant impact would occur if the proposed Project would conflict with or obstruct implementation of the applicable air quality plan. The San Joaquin Valley Air Basin (SJVAB) is designated nonattainment of State and federal health-based air quality standards for ozone and particulate matter less than 2.5 microns (PM_{2.5}). The SJVAB is designated attainment for federal particulate matter less than 10 microns (PM₁₀) standards and nonattainment of state PM₁₀. To meet federal Clean Air Act (CAA) requirements, the SJVAPCD has multiple air quality attainment plan (AQAP) documents, including:

- 2008 Extreme Ozone Attainment Demonstration Plan (EOADP) for attainment of the 1-hour ozone standard;
- 2007 Ozone Plan for attainment of the 8-hour ozone standard;
- 2007 PM₁₀ Maintenance Plan and Request for Re-designation; and
- 2008 PM_{2.5} Plan.

Because of the region's federal nonattainment status for ozone and PM_{2.5}, and State nonattainment status for ozone, PM_{2.5}, and PM₁₀, if the Project-generated emissions of either the ozone precursor pollutants [reactive organic gases (ROG) or oxides of nitrogen (NO_x)], PM₁₀, or PM_{2.5} were to exceed the SJVAPCD's significance thresholds, then the Project uses would be considered to conflict with the attainment plans. In addition, if the Project uses were to result in a change in land use and corresponding increases in vehicle miles traveled, they may result in an increase in vehicle miles traveled that is unaccounted for in regional emissions inventories contained in regional air quality control plans.

The SJVAPCD air quality thresholds from the GAMAQI, presented in Table 3.4.3-1. The SJVAPCD separates construction emissions from operational emissions, and further separates permitted operational emissions from non-permitted operational emissions, for determining significance thresholds for air pollutant emissions.

Table 3.4.3-1 SJVAPCD Air Quality Thresholds of Significant – Criteria Pollutants

Pollutant/Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NO _x	10	10	10
ROG	10	10	10
SO _x	27	27	27
PM ₁₀	15	15	15
PM _{2.5}	15	15	15

Source: (Insight Environmental, 2019), SJVAPCD

The criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 for short-term construction emissions and long-term operational emissions.

Construction emission estimates included the following SJVAPCD Regulation VIII required measures for all projects:

- Water exposed area 3 times per day; and
- Reduce vehicle speed to less than 15 miles per hour.

Based on these anticipated activity levels, the Project construction activities would not exceed construction thresholds, as shown in Table 3.4.3-2. Therefore, construction emissions are less than significant.

Table 3.4.3-2: Construction Emission Levels.

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
	(tons/year)					
Unmitigated						
2020 Construction Emissions	0.36	3.29	2.74	0.005	0.46	0.28
2021 Construction Emissions	2.16	0.89	0.91	0.002	0.07	0.05
Mitigated						
2020 Construction Emissions	0.36	3.29	2.74	0.005	0.33	0.22
2021 Construction Emissions	2.16	0.89	0.91	0.002	0.07	0.05
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15
Is Threshold Exceeded?	No	No	No	No	No	No

Source: (Insight Environmental , 2019)

Table 3.4.3-3 displays the Project's long-term operational emissions generated from mobile, energy, and area sources as well as from water use and waste generation emissions. Most of the operational emissions are from mobile sources traveling to and from the Project area. (Insight Environmental , 2019). Operational emissions estimates also included the following mitigation measures, even though the Project was less than significant before mitigation (Insight Environmental , 2019):

- Improved pedestrian network;
- All natural gas hearths; and
- Use electric lawnmower, leaf blower, and chainsaw (3% per SJVAPCD).

Table 3.4.3-3: Construction Emission Levels.

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
	(tons/year)					
Unmitigated						
Operational Emissions	1.56	1.99	7.09	0.02	1.65	0.47

SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded Before Mitigation?	No	No	No	No	No	No
Mitigated						
Operational Emissions	1.56	1.96	6.98	0.02	1.62	0.46
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded After Mitigation?	No	No	No	No	No	No

Source: (Insight Environmental , 2019)

As seen in the table above, the Projects’ long-term operational emissions do not exceed the thresholds. Therefore, the Project would have a less than significant impact.

The GAMAQI states that the SJVAPCD’s established thresholds of significance for criteria pollutant emissions require offsets for stationary sources. Emission reductions achieved through implementation of the Project offset requirements are a major component of the District’s air quality plans. This Project, with emissions well below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of the District’s air quality plan.

Project’s Contribution to Air Quality Violations

As discussed in Impact 3.4.3c below, the predicted construction and operational emissions do not exceed the SJVAPCD’s significance thresholds for ROG, NO_x, PM₁₀, and PM_{2.5}. As a result, the Project would not conflict with emissions inventories contained in regional AQAPs and would not result in a significant contribution to the region’s air quality non-attainment status.

Consistency with Assumptions in Air Quality Attainment Plans (AQAP)

The primary way of determining consistency with the AQAP’s assumptions is determining consistency with the applicable General Plan to ensure that the Project’s population density and land use are consistent with the growth assumptions used in the AQAPs for the air basin.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designates locations for land uses to regulate growth. The Kings County Council of Governments uses the growth Projections and land use information in adopted general plans to estimate future average daily trips and then vehicle miles traveled (VMT), which are then provided to SJVAPCD to estimate future emissions in the AQAPs. Existing and future pollutant emissions computed in the AQAP are based on land uses from area general plans. AQAPs detail the control measures and emission reductions required for reaching attainment of the air standards.

The Project is not anticipated to result in substantial direct or indirect population growth that was not previously anticipated because the student population for the proposed Project. Accordingly, it can be concluded the proposed Project’s uses are consistent with the growth

and vehicle miles traveled Projections contained in the AQAP. The Project impact is less than significant for this criterion.

Control Measures

The AQAPs contain a number of control measures, including the rules outlined by the SJVAPCD. The AQAP control measures are enforceable requirements. The Project would comply with all of the SJVAPCD's applicable rules and regulations. Therefore, the Project would comply with this criterion.

With the incorporation of the enforceable requirements outlined in the AQAP, the Project is not anticipated to result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under any federal or State ambient air quality standards.

The SJVAPCD's Regulation VIII establishes required controls to reduce and minimizing fugitive dust emissions. The following SJVAPCD Rules and Regulations apply to all Projects:

- Rule 4102 - Nuisance;
- Regulation VIII – Fugitive PM10 Prohibitions;
- Rule 8011 - General Requirements;
- Rule 8021 - Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities;
- Rule 8041 - Carryout and Trackout; and
- Rule 8051 - Open Areas.

SJVAPCD's required measures for all Projects would also apply:

- Water exposed areas 3 times per day; and
- Reduce vehicle speed to less than 15 miles per hour.

Based on information from the SPAL, the proposed Project is not expected to result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). Therefore, the proposed project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.3c – Would the Project expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are defined as areas where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside. The following locations are where several sensitive receptors are likely to reside and be affected by substantial pollutant concentrations; schools, hospitals, nursing homes, and daycare centers. The closest schools are Tamarack Elementary School at 0.26 miles to the southwest and Avenal High School ROP, approximately 0.75 miles to the northwest. The closest hospital is Adventist Health Community Care, approximately 0.92 miles to the northwest. The closest daycare facilities are Paramount Child Development Center approximately 0.54 miles southwest and KCAO Oasis Opportunity approximately 0.55 miles southwest of the Project. Based on the predicted operational emissions and activity types, the proposed Project is not expected to affect sensitive receptors and is not expected to have any adverse impacts on any known sensitive receptor (Insight Environmental , 2019).

The proposed Project, because of its residential nature, once constructed is not expected to result in the generation of odors or other hazardous air pollutants. However, during construction of the Project, construction activities and equipment may generate emission from construction equipment exhaust. These impacts are localized and temporary in nature and therefore are considered less than significant. The Project would not expose sensitive receptors to substantial concentrations of localized PM₁₀, carbon monoxide, diesel particulate matter, hazardous air pollutants, or naturally occurring asbestos, as discussed below.

Hazardous Pollutants or Odors

The GAMAQI guidelines introduce two types of Projects that should be assessed when considering hazardous air pollutants (HAPs) which includes: 1) placing a toxic land use in an area where it may have an adverse health impact on an existing sensitive land use and 2) placing a sensitive land use in an area where an adverse health impact may occur from an existing toxic land use. Some examples of Projects that may include HAPs are:

- Agricultural products processing;
- Bulk material handling;
- Chemical blending, mixing, manufacturing, storage, etc.;
- Combustion equipment (boilers, engines, heaters, incinerators, etc.);
- Metals etching, melting, plating, refining, etc.;
- Plastics & fiberglass forming and manufacturing;
- Petroleum production, manufacturing, storage, and distribution; and
- Rock & mineral mining and processing.

The proposed Project is located on a site that is currently undeveloped land that was previously used for agricultural purposes. The proposed Project consists of 122 houses with all applicable utilities and infrastructure. During the construction period some odors could result from vehicles and equipment using diesel fuels. However, vehicles and equipment using diesel fuels at the proposed Project would have to comply with the California Air

Resources Board (CARB) guidelines, which limit idling time to five minutes with the Airborne Toxic Control Measure (ATCM). All construction would be temporary.

Additionally, the proposed Project is located near other residential or multi-family developments. Residential neighborhoods and multi-family developments are not known to be a source of nuisance odors. The Project is not expected to expose sensitive receptors to substantial pollutant concentrations. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.3d Would the Project result in emissions (such as those leading to odors) adversely affecting a substantial number of people?

As discussed in Impact #3.4.3c above. The residential nature of this Project is not expected to result in the generation of odors or hazardous air pollutants that would affect a substantial number of people. The emissions associated with the construction of the Project would be temporary in nature and are not anticipated to result in the generation of a substantial amount of hazardous air pollutants. Therefore, the Project will have a less than significant impact

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.4 - BIOLOGICAL RESOURCES

Would the Project:

a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	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 California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

A biological reconnaissance survey was conducted to determine whether there are sensitive biological resources that might be adversely affected by the proposed Project. The evaluation is based upon existing site conditions, the potential for sensitive biological resources to occur

on and in the vicinity of the Project site, and any respective impacts that could potentially occur.

In addition to providing an evaluation of the Project's impacts to biological resources, the report includes a detailed description of the regulatory environment as it relates to biological resources.

A literature review of the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDDB) (California Department of Fish and Wildlife, 2019) California Native Plant Society (California Native Plant Society, 2019), and United States Fish and Wildlife Service Endangered Species List (US Fish and Wildlife Service, 2019) was conducted to identify special-status plant and wildlife species with the potential to occur within the Project site and vicinity (the surrounding nine quads and a 10-mile radius). Information on the potential presence of wetlands and waters was obtained from the National wetlands Inventory (NWI), National Hydrography database (NHD) and Federal Emergency Management Agency (FEMA). Information regarding the presence of Critical Habitat in the Project vicinity was obtained from the United States Fish and Wildlife Service's Critical Habitat Mapper database. The results of the database inquiries were subsequently reviewed to evaluate the potential for occurrence of special-status species and other sensitive biological resources known to occur on or near the Project site prior to conducting the biological reconnaissance survey.

On October 31, 2019, a QK biologist conducted a biological reconnaissance survey of the entire Project site and a 250-foot buffer area (Biological Survey Area [BSA]), where feasible. The purpose of the survey was to determine the locations and extent of potential plant communities and sensitive habitats, determine the potential for occurrence of special-status plant and animal species, and identify other sensitive biological resources within the Survey Area. Survey methodologies included walking meandering pedestrian transects through all present habitat types. Protocol surveys for specific special-status wildlife species were not conducted for this report as it was determined by the consulting biologist that such surveys were not warranted due to the condition of the Project site. Photographs were taken to document existing landscape of the Project site and adjacent land uses; detailed notes on observed plant and wildlife species and site conditions were taken while conducting the survey.

General Site Conditions

The entire Project site has experienced significant historical as well as ongoing ground disturbance from agricultural practices and livestock grazing. The wildlife species inhabiting the BSA include those typically found in moderately- to heavily- disturbed habitats associated with agricultural development zones of Kings County and the southern San Joaquin Valley. The Project site had been previously planted with winter wheat that has been recently harvested, with little vegetation present. Several California ground squirrel (*Otospermophilus beecheyi*) burrows were observed on the Project site, primarily along the western and eastern fence-lines and several pocket gopher (*Thomomys* sp.) burrows within the Project site. Also, several potential San Joaquin kit fox dens were present, mainly on the

eastern segment of the BSA. There is an area of low topographical relief in the northwest corner of the BSA where evidence of water seepage occurred. However, there is no wetland, riparian, or other sensitive habitat recorded during the time of the survey.

There were twelve plant species and eleven wildlife species identified during the survey, either through direct observation or by the presence of diagnostic signs (Table 3.4.4-1).

Table 3.4.4-1
List of Plant and Wildlife Species Observed within the Survey Area

Scientific name	Common name
Plants	
<i>Avena fatua</i>	wild oat
<i>Bromus madritensis ssp. rubens</i>	red brome
<i>Convolvulus arvensis</i>	field bindweed
<i>Croton setiger</i>	turkey mullein
<i>Cynodon dactylon</i>	Bermuda grass
<i>Datura stramonium</i>	Jimson weed
<i>Hordeum murinum</i>	foxtail barley
<i>Lactuca serriola</i>	prickly lettuce
<i>Malva parviflora</i>	cheeseweed mallow
<i>Salsola tragus</i>	Russian thistle
<i>Schismus arabicus</i>	Mediterranean grass
<i>Sisymbrium irio</i>	London rocket
Wildlife	
<i>Bos taurus</i>	domestic cow
<i>Canis lupus familiaris</i>	domestic dog*
<i>Corvus brachyrhynchos</i>	American crow
<i>Felis catus</i>	domestic cat
<i>Haemorrhous mexicanus</i>	house finch
<i>Otospermophilus beecheyi</i>	California ground squirrel
<i>Passer domesticus</i>	house sparrow
<i>Sayornis nigricans</i>	black Phoebe
<i>Thomomys</i> sp.	pocket gopher*
<i>Zenaida macroura</i>	mourning dove
<i>Zonotrichia leucophrys</i>	white-crowned sparrow

*Indicates that only sign (scat, tracks, prey remains, dens) were observed.

Impact Analysis

This section describes the results of the database searches and, using conditions present on the Project site as determined by the on-site examination, provides an analysis of Project impacts on each of six biological evaluation criteria. Each of the evaluation criteria are discussed below and mitigation measures are provided as warranted to, when implemented, reduce impacts to below significant levels.

Impact #3.4.4a – Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The literature search indicated that there is a potential for several sensitive natural communities and special-status species to be present on the Project site. An evaluation of each of the potentially occurring sensitive natural communities and special-status species, which included habitat requirements, likelihood of required habitat to occur within the Project area, and a comparison to the CNDDDB records was conducted. The results of this evaluation concluded that no sensitive natural community or special-status plant species are anticipated to occur on or near the Project site, and that seven wildlife species have a reasonable potential to occur on or near the Project site.

Sensitive Natural Communities and Special-Status Species

SENSITIVE NATURAL COMMUNITIES AND SPECIAL-STATUS PLANTS

Based on the database query, there were no sensitive natural communities and 15 special-status plant species identified as having potential to occur within the subject quadrangle and eight surrounding quadrangles. According to CNDDDB recorded occurrences, there are no sensitive natural communities and 11 plant species found within a 10-mile buffer of the Project site. However, the Project site and vicinity has been highly disturbed for years due to ongoing agriculture production and nearby residential development, and it does not provide habitat for any of these sensitive natural communities or special-status plant species. No special-status plant species were identified during the biological reconnaissance survey. Although protocol-level botanical surveys were not conducted and the reconnaissance survey did not coincide with optimum blooming periods for all plant species, it is not anticipated that special-status plant species occur on the Project site.

SPECIAL-STATUS WILDLIFE

Based on the database query, there were 21 special-status wildlife species that were identified as having a potential to occur within subject quadrangle and eight surrounding quadrangles. According to CNDDDB recorded occurrences there are 15 special-status wildlife species found within a 10-mile buffer of the Project site. Of the 21 species, 14 were eliminated from consideration due to the lack of suitable habitat within the Project site. The remaining seven species have a low, moderate, or high potential to occur within the Project site and vicinity. There are no species with a high potential to occur on or near the Project site, two species with a moderate potential (western burrowing owl [*Athene cunicularia*] and San Joaquin kit fox [*Vulpes macrotis mutica*]) to occur on or near the Project site and five species (American badger [*Taxidea taxus*], San Joaquin pocket mouse [*Perognathus inornatus*], San Joaquin coachwhip [*Coluber flagellum ruddocki*], Swainson's hawk [*Buteo swainsoni*], and prairie falcon [*Falco mexicanus*]) with a low potential to occur on or near the Project site. Protocol surveys for specific special-status wildlife species were not

conducted for this report because it was determined that such surveys were not warranted due to the conditions present on the Project site.

Western Burrowing owl

The western burrowing owl has a moderate potential to occur within the Project site and immediate surrounding area. Historically, burrowing owl have been recorded within two miles of the Project site. The most recent CNDDDB recorded occurrence (EONDX 34799) of a burrowing owl is over 10 miles south of the Project site. Therefore, there is a moderate potential for burrowing owl to reside or forage on the Project site and in open fields in the vicinity of the Project site. No burrowing owl or sign were observed during the survey; however, potential burrows are present, and they could inhabit the Project site.

San Joaquin Kit Fox

The San Joaquin kit fox has a moderate potential to occur within the Project site and immediate surrounding area. The most recent CNDDDB recorded occurrence (EONDX 66433) of a San Joaquin kit fox observation is over 10 miles southwest of the Project site. Historically, San Joaquin kit fox have been recorded within 0.3 miles of the Project site. Therefore, there is a moderate potential for the San Joaquin kit fox to reside or forage on the Project site and in open fields in the vicinity of the Project site. Potential San Joaquin kit fox dens of suitable size are present; however, no other sign (e.g., tracks, scat, fur, prey remains) suggesting habitation by this species was observed within the BSA during the reconnaissance survey. The San Joaquin kit fox is known to occur in the vicinity of the Project site and could potentially inhabit the site at any time or individuals could potentially be present from time to time as transient foragers.

American Badger

The American badger has a low potential to occur within the Project site and immediate surrounding area. There is a low potential for American badger to reside or forage on the Project site. The most recent CNDDDB record occurrence (EONDX 57408) was recorded over 80 years ago and no potential burrows or sign were observed during the reconnaissance survey. The American badger is known to occur in the vicinity of the Project site and could potentially be present from time to time as a transient forager.

San Joaquin Pocket Mouse

The San Joaquin pocket mouse has a low potential to occur within the Project site and immediate surrounding area. Historically, San Joaquin pocket mouse have been recorded within 0.6 miles of the Project site. However, the most recent CNDDDB record occurrence (EONDX 65614) of a San Joaquin pocket mouse is over 10 miles southeast of the Project site. The Project site consists of very little ideal habitat and has low-quality food resources; no San Joaquin pocket mouse or sign were observed during the survey. There is a low potential for the San Joaquin pocket mouse to burrow or forage on the Project site and in adjacent

open fields to the Project site. However, potential burrows are present, so they could inhabit the Project site.

San Joaquin Coachwhip

The San Joaquin coachwhip has a low potential to occur within the Project site and immediate surrounding area. Historically, San Joaquin coachwhip have been recorded within 0.7 miles of the Project site. The most recent CNDDDB record occurrence (EONDX 80095) of a San Joaquin coachwhip is over 10 miles southeast of the Project site. No San Joaquin coachwhip or sign were observed during the survey and there are no substantial number of small mammal burrows or sign that would support this species prey base; however, potential refuge burrows are present, and they could inhabit the Project site at any time as a transient forager.

Swainson's Hawk

The Swainson's hawk has a low potential to occur within the immediate area surrounding the Project site. The most recent CNDDDB recorded occurrence (EONDX 115314) of Swainson's hawk was over 10 miles southwest of the Project site. Swainson's hawks are known to forage in old field and open agricultural fields, such as hay or alfalfa. The surrounding area has been historically used for dryland agricultural production, such as winter wheat. There are no substantial number of small mammal burrows or sign that would support this species prey base and there is no suitable nesting habitat on the Project site or immediate vicinity. Additionally, no Swainson's hawks or sign of the species was observed during the survey.

Prairie Falcon

The prairie falcon has a low potential to occur within the Project site and immediate surrounding area. The most recent CNDDDB record occurrence (EONDX 26025) of a prairie falcon was documented within 10 miles of the Project site. There is a low potential for prairie falcon to reside or forage on the Project site. The prairie falcon is known to occur in the vicinity of the Project site, however, no suitable nesting habitat, prairie falcon or sign of the species was observed during the reconnaissance level biological survey.

CONCLUSION

The Project site and surrounding area has been disturbed for years by ongoing agriculture crop cultivation and residential development. The Project site and vicinity does not provide suitable habitat for any special-status plant species and no mitigation measures to protect, avoid, or minimize impacts to special-status plant species are warranted.

There is the potential for several special-status or protected wildlife species to be impacted by Project activities. Compliance with Mitigation Measures MM BIO-1 through MM BIO-6 would protect, avoid, and minimize impacts to special-status wildlife species. When

implemented, these measures would reduce impacts to these species to below significant levels.

MITIGATION MEASURE(S)

MM BIO-1: Prior to ground disturbing activities, a qualified wildlife biologist shall conduct a biological clearance survey between 14 and 30 calendar days prior to the onset of construction. The clearance survey shall include walking transects to identify presence of San Joaquin kit fox, American badger, Swainson's hawk, Western burrowing owl, coachwhip, nesting birds, and other special-status species or signs of, and sensitive natural communities. The pre-construction survey shall be walked by no greater than 30-foot transects for 100 percent coverage of the Project site and the 50-foot buffer, where feasible. A report outlining the results of the survey shall be submitted to the Lead Agency.

Potential kit fox dens may be excavated provided that the following conditions are satisfied: (1) the den has been monitored for at least five consecutive days and is deemed unoccupied by a qualified biologist; (2) the excavation is conducted by or under the direct supervision of a qualified biologist. Den monitoring and excavation should be conducted in accordance with the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (United States Fish and Wildlife Service, 2011).

In addition, impacts to occupied burrowing owl burrows shall be avoided in accordance with the following table unless a qualified biologist approved by CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

MM BIO-2: Prior to ground disturbance activities, or within one week of being deployed at the Project site for newly hired workers, all construction workers at the Project site shall attend a Construction Worker Environmental Awareness Training and Education Program, developed and presented by a qualified biologist.

The Construction Worker Environmental Awareness Training and Education Program shall be presented by the biologist and shall include information on the life history wildlife and plant species that may be encountered during construction activities, their legal protections,

the definition of “take” under the Endangered Species Act, measures the Project operator is implementing to protect the species, reporting requirements, specific measures that each worker must employ to avoid take of the species, and penalties for violation of the Act. Identification and information regarding special-status or other sensitive species with the potential to occur on the Project site shall also be provided to construction personnel. The program shall include:

- An acknowledgement form signed by each worker indicating that environmental training has been completed.
- A copy of the training transcript and/or training video/CD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms shall be maintain on site for the duration of construction activities.

MM BIO-3: If all Project activities are completed outside of the Swainson’s hawk nesting season (February 15 through August 31), this mitigation measure shall need not be applied. If construction is planned during the nesting season, a preconstruction survey shall be conducted by a qualified biologist to evaluate the site and a 0.5-mile buffer around the site for active Swainson’s hawk nests. If potential Swainson’s hawk nests or nesting substrates occur within 0.5 mile of the Project site, then those nests or substrates must be monitored for Swainson’s hawk nesting activity on a routine and repeating basis throughout the breeding season, or until Swainson’s hawks or other raptor species are verified to be using them. Monitoring shall be conducted according to the protocol outlined in the *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (Swainson’s Hawk Technical Advisory Committee 2000). The protocol recommends that ten visits be made to each nest or nesting site: one during January 1-March 20 to identify potential nest sites, three during March 20-April 5, three during April 5-April 20, and three during June 10-July 30. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to Project-related ground disturbance activities. During the nesting period, active Swainson’s hawk nests shall be avoided by 0.5 mile unless this avoidance buffer is reduced through consultation with the CDFW and/or USFWS. If an active Swainson’s hawk nest is located within 500 feet of the Project or within the Project site, the Project proponent shall contact CDFW for guidance.

MM BIO-4: A qualified biologist shall conduct a pre-construction survey on the Project site and within 500 feet of its perimeter, where feasible, to identify the presence of the western burrowing owl. The survey shall be conducted between 14 and 30 days prior to the start of construction activities. If any burrowing owl burrows are observed during the preconstruction survey, avoidance measures shall be consistent with those included in the CDFW staff report on burrowing owl mitigation (CDFG 2012). If occupied burrowing owl burrows are observed outside of the breeding season (September 1 through January 31) and within 250 feet of proposed construction activities, a passive relocation effort may be instituted in accordance with the guidelines established by the California Burrowing Owl Consortium (1993) and the California Department of Fish and Wildlife (2012). During the breeding season (February 1 through August 31), a 500-foot (minimum) buffer zone should be maintained unless a qualified biologist verifies through noninvasive methods that either

the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

MM BIO-5: If construction is planned outside the nesting period for raptors (other than the western burrowing owl) and migratory birds (February 15 to August 31), no mitigation shall be required. If construction is planned during the nesting season for migratory birds and raptors, a preconstruction survey to identify active bird nests shall be conducted by a qualified biologist to evaluate the site and a 250-foot buffer for migratory birds and a 500-foot buffer for raptors. If nesting birds are identified during the survey, active raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified on-site monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season.

No construction or earth-moving activity shall occur within a non-disturbance buffer until it is determined by a qualified biologist that the young have fledged (left the nest) and have attained sufficient flight skills to avoid Project construction areas. Once the migratory birds or raptors have completed nesting and young have fledged, disturbance buffers will no longer be needed and can be removed, and monitoring can cease.

MM BIO-6: During all construction-related activities, the following mitigation shall apply:

- a. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from the construction or Project site.
- b. Construction-related vehicle traffic shall be restricted to established roads and predetermined ingress and egress corridors, staging, and parking areas. Vehicle speeds should not exceed 20 miles per hour (mph) within the Project site.
- c. To prevent inadvertent entrapment of kit fox or other animals during construction, the contractor shall cover all excavated, steep-walled holes or trenches more than two feet deep at the close of each workday with plywood or similar materials. If holes or trenches cannot be covered, one or more escape ramps constructed of earthen fill or wooden planks shall be installed in the trench. Before such holes or trenches are filled, the contractor shall thoroughly inspect them for entrapped animals. All construction-related pipes, culverts, or similar structures with a diameter of four-inches or greater that are stored on the Project site shall be thoroughly inspected for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If at any time an entrapped or injured kit fox is discovered, work in the immediate area shall be temporarily halted and USFWS and CDFW shall be consulted.
- d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of four-inches or greater that are stored at a construction site for one

or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

- e. No pets, such as dogs or cats, shall be permitted on the Project sites to prevent harassment, mortality of kit foxes, or destruction of dens.
- f. Use of anti-coagulant rodenticides and herbicides in Project areas shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional Project-related restrictions deemed necessary by the USFWS and CDFW. If rodent control must be conducted, zinc phosphide shall be used because of the proven lower risk to kit foxes.
- g. A representative shall be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS.
- h. The Sacramento Fish and Wildlife Office of USFWS and CDFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFW contact can be reached at ~~1701~~ (559) 243-4014 and R4CESA@wildlifeca.gov.
- i. All sightings of the San Joaquin kit fox shall be reported to the California Natural Diversity Database (CNDDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to the Service at the address below.
- j. Any Project-related information required by the USFWS or questions concerning the above conditions, or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at: Endangered Species Division, 2800 Cottage Way, Suite W 2605, Sacramento, California 95825-1846, phone (916) 414-6620 or (916) 414-6600.
- k. If burrowing owl are found to occupy the Project site and avoidance is not possible, burrow exclusion may be conducted by qualified biologists only during the non-breeding season, before breeding behavior is exhibited, and after the burrow is confirmed empty through non-invasive methods (surveillance). Replacement or occupied burrows shall consist of artificial burrows at a ratio of 1 burrow collapsed to 1 artificial burrow constructed (1:1). Ongoing surveillance of the Project site during construction activities shall occur at a rate sufficient to detect Burrowing owl, if they return.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.4b – Would the Project 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 California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

According to CNDDDB there are no sensitive natural communities with the potential to occur within 10-miles of the Project site (California Department of Fish and Wildlife, 2019). The Project site is highly disturbed and does not provide habitat to maintain these communities. No sensitive natural communities were identified within the Project site or buffer area during the biological reconnaissance survey. There are no anticipated impacts to sensitive natural communities as a result of the proposed Project. The Project site covers an area of approximately 18.5 acres and consists of recently harvested agriculture and grazing operations. The Project site is surrounded by disturbed cultivated land, grazing operations, non-native habitat, and residential development.

Riparian habitat is defined as lands that are influenced by a river, specifically the land area that encompasses the river channel and its current or potential floodplain. The Project is not located within a river or an area that encompasses a river or potential floodplain. The proposed Project would not have any adverse effect to a riparian habitat

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.4c – Would the Project 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?

The United States Army Corps of Engineers (USACE) has regulatory authority over the Clean Water Act (CWA), as provided for by the EPA. The USACE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. There are no federally protected wetlands or vernal pools that occur within the Project site.

Wetlands, streams, reservoirs, sloughs, and ponds typically meet the criteria for federal jurisdiction under Section 404 of the CWA and State regulatory authority under the Porter-Cologne Water Quality Control Act. Streams and ponds typically meet the criteria for State regulatory authority under Section 1602 of the California Fish and Game Code. There are no features on the Project site that would meet the criteria for either federal jurisdiction or State

regulatory authority. There would be no impact to federally protected wetlands or waterways or State wetlands or waters.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *no impact*.

Impact #3.4.4d – Would the Project 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?

Wildlife migratory corridors are described as a linear stretch of land that connects two open pieces of habitat that would otherwise be unconnected. These routes provide shelter and sufficient food resources to support wildlife species during migratory movements. Movement corridors generally consist of riparian, woodlands, or forested habitats that span contiguous acres of undisturbed habitat and are important elements of resident species' home ranges.

The proposed Project and surrounding area occur within a known essential connectivity area identified by the Essential Habitat Connectivity Project (Spencer, W.D., et al, 2010). However, due to the existing disturbed condition of the Project site and the urbanized character of the surrounding area, primarily consisting of residential development and agriculture production, the use of connectivity habitat by sensitive wildlife is unlikely. The proposed Project does not occur within terrestrial migration route, significant wildlife corridor, or wildlife linkage area as identified in the Recovery Plan for Upland Species in the San Joaquin Valley (US Fish and Wildlife Service, 1998). The survey conducted for the Project did not provide evidence of a wildlife nursery or important migratory habitat being present on the Project site. Migratory birds and raptors could use habitat on or near the Project for foraging and/or as stopover sites during migrations or movement between local areas.

The Project would not substantially affect migrating birds or other wildlife. The Project will not restrict, eliminate, or significantly alter a wildlife movement corridor, wildlife core area, or Essential Habitat Connectivity area, either during construction or after the Project has been constructed. Project construction will not substantially interfere with wildlife movements or reduce breeding opportunities.

Additionally, the land surrounding the Project site is developed with residences or is planned for continuation of agricultural development that would sever wildlife movement through the site and eliminate any nursery site. The proposed Project would not interfere 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. Therefore, there would be no impacts to wildlife movements, would not affect movement corridors, or impeded a nursery site.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *less than significant*.

Impact #3.4.4e – Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

There are no adopted local policies or ordinances protecting biological that would apply to this Project site. Therefore, implementation of the proposed Project would have no conflict related to an adopted local policies or ordinances protecting biological resources.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.4f – Would the Project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

The Project site is not located within any Natural Community Conservation Plan area or any other local, regional, or State habitat conservation plan.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.5 - CULTURAL RESOURCES

Would the Project:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

This section is based on a Cultural Resources technical memo prepared for the Project (Parr, R.E., 2019). The memo is included as Appendix B of this document.

Impact #3.4.5a – Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?

As defined by CEQA Guidelines Section 15064.5, "historical resources" are:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resource Code Section 5024.1, Title 14 California Code of Regulations, Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

Any: object, building, structure, site, area, place, record, or manuscript which a Lead Agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the Lead Agency's determination is supported by substantial evidence in light of the whole

record. Generally, a resource shall be considered by the Lead Agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852) including the following:

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

The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a Lead Agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

A cultural resource record search (RS # 19-438) was conducted at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System at the California State University, Bakersfield. and a Sacred Lands File request was submitted to the Native American Heritage Commission (Appendix B). The purpose of the search was to determine whether any known cultural resources or previously conducted cultural resource surveys were located on or near the Project.

The records search covered an area within one-half-mile of the subject property and included a review of the *National Register of Historic Places*, *California Points of Historical Interest*, *California Registry of Historic Resources*, *Historical Landmarks*, *California State Historic Resources Inventory*, and a review of cultural resource reports on file.

The records search indicated that the subject Project site has never been surveyed for cultural resources. Seven cultural resources studies have been conducted within a half mile of the Project site. One historical cultural resource has been recorded within a half mile of the parcel, a domestic trash scatter possibly dating to the 1930s. No further cultural surveys or resources have been documented within a half mile of the Project site.

Avenal's history dates back to 1850, when American settlers arrived in the area and established settlements east and south of the existing urbanized portion of the City. Accordingly, there are numerous buildings within the Study Area that appear to be more than 50 years old and could qualify as historical architectural resources. The Avenal General Plan 2025 EIR analyzed impacts to cultural resources, and found no evidence of archaeological resources in the area (City of Avenal, 2018)

Although there is no obvious evidence of historical or archaeological resources on the Project site, there is the potential during construction for the discovery of cultural resources. Grading and trenching, as well as other ground-disturbing actions, have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the Project area, including historical resources. Although unlikely, the disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact under CEQA. However, implementation of MM CUL-1 would reduce potential impacts to cultural resources to less than significant levels

MITIGATION MEASURE(S)

MM CUL-1: a) If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.

b) If requested by a Native American tribal group, the Project developer shall have a Native American monitor on site during initial ground disturbance activities

LEVEL OF SIGNIFICANCE

Impact would be *less than significant with mitigation incorporated*.

Impact #3.4.5b – Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?

See discussion of Impact #3.4.5a, above

On October 22, 2019, a request was made to the Native American Heritage Commission (NAHC) for a Sacred Lands File (SLF) search. The result of the search was negative.

On October 31, 2019 and December 4, 2019, pursuant to Public Resources Code § 21080.3.1 and Government Code § 65300 *et seq*, letters were sent to each of the six Native American tribes within the geographic area as identified by the NAHC (see Appendix B). The letters included a Project description and location maps. To date, no response has been received from any Tribe that was contacted.

See also discussion of Impact #3.4.5a, above.

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM CUL-1

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.5c – Would the Project disturb any human remains, including those interred outside of formal cemeteries?

There are no known cemeteries or burials on or near the Project. Although unlikely, subsurface construction activities, such as trenching and grading, associated with the proposed Project could potentially disturb previously undiscovered human burial sites. Accordingly, this is a potentially significant impact. Although considered unlikely subsurface construction activities could cause a potentially significant impact to previously undiscovered human burial sites. The cultural resources and Sacred Lands File records searches did not indicate the presence of human remains, burials, or cemeteries within or in the vicinity of the Project site. No human remains have been discovered at the Project site, and no burials or cemeteries are known to occur within the area of the site. However, construction would involve earth-disturbing activities, and it is still possible that human remains may be discovered, possibly in association with archaeological sites. Implementation of the below mitigation measure would ensure that the proposed Project would not directly or indirectly destroy previously unknown human remains. It is unlikely that the proposed Project would disturb any known human remains, including those interred outside of formal cemeteries. However, with implementation of MM CUL-2, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

MM CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the NAHC, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

LEVEL OF SIGNIFICANCE

Impact would be *less than significant with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.6 - ENERGY

Would the Project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Discussion

The following analysis is based on Project data provided by the applicant, the Small Project Analysis Level Assessment (SPAL) and available energy resource consumption data .

Impact #3.4.6a – Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Construction

Energy demand during the construction phase would result from the transportation of materials, construction equipment, and construction worker vehicle trips. Construction equipment includes scrapers, motor graders (blades), vibrators and static compactors, 3500 gallon water trucks, track excavators, graders, off-highway trucks, rubber-tired loaders and backhoes, concrete trucks tractors, concrete extrusion machine, cranes, forklifts, generator sets, pavers, air compressors and rollers. The Project would comply with the SJVAPCD requirements regarding the use of fuel-efficient vehicles and equipment, to the extent feasible. Using a typical fuel efficiency of 5.85 miles per gallon, the delivery of building materials is expected to require approximately 49,000 gallons of diesel per construction phase as seen on Table 3.4.6-1. The Project will not use natural gas during the construction phase. Compliance with standard regional and local regulations, the Project would minimize fuel consumption during construction. By complying with standard regional and local regulations, the Project would minimize fuel consumption during construction. Table 3.4.6-1 displays how the breakdown of construction related items will use approximately, 48,570 gallons of fuel.

Table 3.4.6-1: Energy Consumption – Construction Breakdown

Phase Name	Off road Equipment Type	total hours	Amount	Usage Hours	Horse Power	Load Factor	HP-Hour	Fuel Consumption (gal)	Total per phase per day	days	total gallons per phase
Site Preparation	Rubber Tired Dozers	24	3	8.00	247	0.40	2371.2	121.40544			
Site Preparation	Tractors/ Loaders/ Backhoes	32	4	8.00	97	0.37	1148.48	58.802176	180.2076	10	1802.076
Grading	Excavators	16	2	8.00	158	0.38	960.64	49.184768			
Grading	Graders	8	1	8.00	187	0.41	613.36	31.404032			
Grading	Rubber Tired Dozers	8	1	8.00	247	0.40	790.4	40.46848			
Grading	Scrapers	16	2	8.00	367	0.48	2818.56	144.310272			
Grading	Tractors/ Loaders/ Backhoes	16	2	8.00	97	0.37	574.24	29.401088	294.7686	30	8843.059
Building Construction	Cranes	7	1	7.00	231	0.29	468.93	24.009216			
Building Construction	Forklifts	24	3	8.00	89	0.20	427.2	21.87264			
Building Construction	Generator Sets	8	1	8.00	84	0.74	497.28	25.460736			
Building Construction	Tractors/ Loaders/ Backhoes	21	3	7.00	97	0.37	753.69	38.588928			
Building Construction	Welders	8	1	8.00	46	0.45	165.6	8.47872	118.41024	300	35523.072
Paving	Pavers	16	2	8.00	130	0.42	873.6	44.72832			
Paving	Paving Equip..	16	2	8.00	132	0.36	760.32	38.928384			
Paving	Rollers	16	2	8.00	80	0.38	486.4	24.90368	108.56038	20	2171.2077
Architectural Coating	Air Compressors	6	1	6.00	78	0.48	224.64	11.501568	11.501568	20	230.03136
HP-Hour = Load Factor x Total Hours x Horsepower				Fuel Consumption = HP-Hour x .01832 of diesel oil						Total	48980.45

Source: Energy Consumption Technical Memo (QK, 2019)

There are no unusual Project characteristics that would cause construction equipment to be less energy efficient compared with other similar construction sites in other parts of the

State. Thus, construction-related fuel consumption at the Project would not result in inefficient, wasteful, or unnecessary energy use.

Post-Construction

The Project will use a variety of energy-saving components to reduce energy consumption. These includes, but are not limited to dual-pane glass, low-flow toilets, tankless water heaters, and Energy Star rated insulation and appliances. In addition, solar panels will be installed on the house rooftops to offset electrical costs and reduce the impact to the Avenal PG&E electrical grid.

Construction related fuel consumption is not expected to result in inefficient, wasteful, or unnecessary energy use. The Project will comply with all applicable standards and building codes included in the 2019 California Green Building Standards Code. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.6b – Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Project must comply with Title 24, Chapter 4 of the California Green Building Standards Code for residential development and Part 6, of the California Energy Code (CEC) the California Code of Regulations (CCR), Title 20 with adoptions of the California Energy Commission (California Building Standards Commission, 2019).

The Project would result in the construction of a residential subdivision consisting of 122 single-family residences occupying a total of approximately 18.65 acres. Energy saving strategies will be implemented where feasible to reduce the Project's energy consumption during the construction and post-construction phases. Strategies being implemented include those recommended by the California Air Resources Board (CARB) that may reduce both the Project's construction energy consumption, including diesel anti-idling measures, light-duty vehicle technology, usage of alternative fuels such as biodiesel blends and ethanol, and heavy-duty vehicle design measures to reduce energy consumption. Additionally, as outlined in the SJVAPCD's GAMAQI, the Project includes recommendations to reduce energy consumption by shutting down equipment when not in use for extended periods, limiting the usage of construction equipment to eight cumulative hours per day, usage of electric equipment for construction whenever possible in lieu of diesel or gasoline powered equipment, and encouragement of employees to carpool to retail establishments or to remain on-site during lunch breaks.

The Project will also incorporate energy saving design features as outlined in the 2019 California Green Building Standards Code in order to offset energy consumption and costs. As noted above, energy efficiency design features include, skylights, dual-pane glass windows with window treatments and by the use of renewable energy. The Project proposes to install photovoltaic solar panels on the roof of each home to reduce the operational electricity demand of the Project, in addition to installing the necessary electrical infrastructure to allow for Electric Vehicle (EV) charging within the private, attached garages of each home. Energy efficient lighting and low flow plumbing infrastructure will also be installed in each home. In addition, the Project will comply with the City of Avenal Uniform Building Codes- Chapter 7, Landscaping Requirements including xeriscaping, the use of drought tolerant plants and drip irrigation to reduce water consumption. Based on this analysis, the Project would be consistent and not conflict with or obstruct a State of local plan related to renewable energy or energy consumption. Impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.7 - GEOLOGY AND SOILS

Would the Project:

- a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

☐ ☐ ☒ ☐

ii. Strong seismic ground shaking?

☐ ☐ ☒ ☐

iii. Seismic-related ground failure, including liquefaction?

☐ ☐ ☒ ☐

iv. Landslides?

☐ ☐ ☒ ☐

- b. Result in substantial soil erosion or the loss of topsoil?

☐ ☒ ☐ ☐

- c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

☐ ☐ ☒ ☐

- d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

☐ ☒ ☐ ☐

- e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

☐ ☐ ☒ ☐

- f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

☐ ☒ ☐ ☐

Discussion

The following analysis is based primarily on the Avenal General Plan for 2035, the General Plan Enhancement IS/MND and a Geotechnical Report (RMA GeoScience, 2019), and an Addendum (RMA GeoScience, 2019a) prepared for this Project, which are included as Appendix C of this document, along with other available data.

Impact #3.4.7a(i) – Would the Project Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving – Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

All of Kings County and the central Valley is considered seismically active. The proposed construction and use of the proposed Project would increase the potential exposure of persons working and living in the Project site to possible seismic events including risk of loss, injury, and death related to earthquakes and related hazards.

Although the City of Avenal is located in a seismically active area and there is potential for seismic activity in the Project area. The Project site is not located within the bounds of an Earthquake Fault Zone for fault-rupture hazard as defined by the Alquist-Priolo Earthquake fault Zoning Act and no faults are known to pass through the property (RMA GeoScience, 2019). The lack of mapped active and potentially active faults notwithstanding, the Project could be subjected to strong ground shaking during an earthquake on a nearby fault such as the thrust fault to the east along the Kettleman Hills anticline, the San Andreas Fault, the Nunez Fault and the Pond Fault, located approximately eighteen miles southwest, twenty three miles northwest and fifty miles southeast, respectively (RMA GeoScience, 2019). The safety risk to people resulting from seismic activity would be significantly decreased by mandatory adherence to all relevant building codes, including the California Building Code (City of Avenal, 2018).

By adhering to the most recent California building Standard Codes, the Project will have a less than significant impact of endangering people and structures associated with this Project. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impact would be *less than significant*.

Impact #3.4.7a(ii) – Would the Project Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving – strong seismic ground shaking?

See discussion of Impact #3.4.7a(i) above.

The Project site lies within the vicinity of six earthquake fault lines. Given the high seismicity of the southern San Joaquin Valley region, moderate to severe ground shaking associated with earthquakes on the nearby faults can be expected within the Project area and throughout Kings County. In the event of an earthquake on one of the nearby faults, it is likely that the Project would experience ground shaking and expose people and structures associated with the Project.

While such seismic shaking would be less severe from an earthquake that originates at a greater distance from the Project site, the side effects could potentially be damaging to residential buildings and supporting infrastructure. The Project is required to design residential buildings and associated infrastructure to withstand substantial ground shaking in accordance with all applicable State law and applicable codes included in the California Building Code (CBC) Title 24 for earthquake construction standards and building standards code including those relating to soil characteristics (California Building Standards Commission, 2019). The Project shall adhere to all applicable local and State regulations to reduce any potentially significant impacts to structures resulting from strong seismic ground shaking at the Project site. Therefore, Project impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.7a(iii) – Would the Project Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving – seismic-related ground failure, including liquefaction?

See discussion of Impact #3.4.7a(i) above.

Liquefaction is defined as a phenomenon where earthquake-induced ground vibrations increase the pore pressure in saturated, granular soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of groundshaking. In order for liquefaction to occur, three criteria must be met: “low density”, coarse-grained (sandy) soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large magnitude earthquake (RMA GeoScience, 2019).

The Project subsurface area soils generally consists of sandy clay, silty sand, sandy silt, and relatively clean sand to the maximum depth of 21 feet. The depth to groundwater in the vicinity of the Project site is approximately 220 feet. (RMA GeoScience, 2019). Because the depth of the groundwater at the Project site is much greater than 50 feet, there is a negligible risk of liquefaction occurring at the Project site during a seismic event.

Based on this analysis, the Project would less than significant impact exposing people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure including liquefaction. Structures constructed as part of the Project would be required by State law to be constructed in accordance with all applicable IBC CBC, Title 24 construction standards. Adherence to all applicable regulations would reduce or avoid any potential impacts to structures resulting from liquefaction at the Project site and impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.7a(iv) – Would the Project Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving – landslides?

Aside from a slight slope to the southwest, the land is relatively flat with no significant topological features. As such, there is no potential for rock fall and landslides to impact the Project in the event of a major earthquake, as the area has no dramatic elevation changes. Based on the predicted maximum horizontal accelerations at the Project site and the soil types, minor subsurface settlement may occur on site during a major earthquake, and this is considered less than significant. The property is flat and there is a low potential for landslides. The Project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving, landslides. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.7b – Would the Project result in substantial soil erosion or the loss of topsoil?

Construction activities associated with the proposed Project will disturb surface vegetation and soils during construction and would expose these disturbed areas to erosion by wind

and water. To reduce the potential for soil erosion and loss of topsoil, the Project would comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit from the State of California Central Valley Regional Water Quality Control Board (RWQCB) during construction. Under the NPDES, the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) are required for construction activities that would disturb an area of one acre or more. A SWPPP must identify potential sources of erosion or sedimentation as well as identify and implement best management practices (BMPs) that ensure reduce erosion. Typical BMPs intended to control erosion include sandbags, retention basins, silt fencing, street sweeping, etc. Mitigation Measure MM GEO-1 requires the approval of a SWPPP to comply with the NPDES General Construction Permit. The Project will comply with all the grading requirements as outlined in Title 24 and Appendix J of the California Building Code (UpCodes, 2016). The Project is not expected to result in substantial soil erosion or the loss of topsoil with the incorporation of mitigation measure MM GEO-1.

Once constructed the Project will have both impermeable surfaces as well as permeable surfaces. Impermeable surfaces would include roadways, driveways and building sites. Permeable surfaces would include front and back yards, any landscaped areas and open space. Overall, development of the Project would not result in conditions where substantial surface soils would be exposed to wind and water erosion.

MITIGATION MEASURE(S)

MM GEO-1: Prior to issuing of grading or building permits, the Project applicant shall submit to the City 1) the approved Storm Water Pollution Prevention Plan (SWPPP) and 2) the Notice of Intent (NOI) to comply with the General National Pollutant Discharge Elimination System (NPDES) from the Central Valley Regional Water Quality Control Board. The requirements of the SWPPP and NPDES shall be incorporated into design specifications and construction contracts. Recommended best management practices for the construction phase may include the following:

1. Stockpiling and disposing of demolition debris, concrete, and soil properly;
2. Protecting existing storm drain inlets and stabilizing disturbed areas;
3. Implementing erosion controls;
4. Properly managing construction materials; and
5. Managing waste, aggressively controlling litter, and implementing sediment controls.
6. Evidence of the approved SWPPP shall be submitted to the Lead Agency.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.7c – Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

See discussion in Impact #3.4.7a(iii) and 3.4.7a(iv) above.

There are no slopes on or near the property and the Project would not expose the people or structures to significant risks from landslides.

As indicated in the General Plan and discussed in Impact #3.4.10b, groundwater levels in Avenal range between 300-1,000 feet below ground surface (bgs). Liquefaction potential appears to be low to moderate. Average groundwater depth is 240 feet (City of Avenal, 2018). Implementation of UBC Standard requirements will help to reduce impacts associated with subsidence of the Project site.

The proposed Project shall comply to all City and State regulations pertaining to construction, including, Section 1613 of the CBC and Building Regulations, of the Avenal Municipal Code. In addition, the California Geologic Society, in implementing the CA Seismic Hazards Mapping Program, has not identified any seismically induced landslide hazard zones in Avenal (City of Avenal, 2018a). Therefore, by complying to the existing regulatory framework would be adequate to reduce any potential impacts to less than significant levels.

As indicated in previous responses, the site is flat and does not have slopes. Additionally, the site is not located near any areas with sufficient slope that could result in off-site landslides. Moreover, the Project will be designed by an engineer as to resist potential side-effects of spreading, subsidence, liquefaction or collapse.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.7d – Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

The Project is located in the Kettleman Hills area along the western margin of the San Joaquin Valley, the Project site is situated on a relatively shallow layer (less than 15 feet deep) of alluvium that is underlain by sedimentary rock associated with the upper Tulare Formation which is comprised of poorly-consolidated gravel, sand and clay with occasional indurated layers throughout (RMA GeoScience, 2019).

Soils on the Project site are composed of sandy clay that extends from the surface to a depth of 12-17 feet and is underlain by silty sand, sandy silt and relatively clean sand. The fine-grained soils have a relative consistency of still to very stiff, while granular soils have a medium dense consistency. Wasco sandy loam is the predominate soil throughout Avenal and the Kettleman Plain. The Kettleman Hills soils are derived from sandstone and shale and are associated with moderate to steep slopes. The Project site is composed of alluvium and Wasco sandy loam that has a medium risk of potential expansion. (RMA GeoScience, 2019).

These soils have a shrinkage factor of 10-15 percent (see Figure 3.4.7-1). (RMA GeoScience, 2019). Shrinkage is the decrease in volume of soil upon removal and recompaction, or scarifying and recompacting, expressed as a percentage of the original in-place volume. The degree to which fill soils are compacted and variations in the *in situ* density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to balance the earthwork.

It is noted that a number of measures may be employed to mitigate for the expansive soils found on the Project site. These include but are not limited to the use of lime treatment or the removal of approximately two feet of expansive soils that are replaced with non-expansive soils, recompaction or recompaction and scarification. Additional measures include shoring or shielding of vertical sidewalls greater than five feet in depth, restricting the parking of construction equipment away from the edge of trenches, etc (RMA GeoScience, 2019) (RMA GeoScience, 2019a). It is also recommended that a registered Geotechnical Engineer, Structural Engineer and Civil Engineer be hired to verify field conditions, prepare a final analysis and verify final recommendations prior to construction activities. Mitigation measures MM GEO-2 through MM GEO-5 outline recommended actions to be employed by the Project, as is deemed necessary by the professional judgement of the Project engineers with approval by the Lead Agency.

The Project shall comply with all applicable requirements of the California Code of Regulations, and the most recent California Building Standards Code that provides criteria for the appropriate design of buildings. As the soils under the Project site have a medium risk of expanding, the Project must comply with mitigation measures GEO-2 through MM GEO-5 in order to reduce the potential impact from expansive soil to less than significant levels.

MITIGATION MEASURE(S)

MM GEO-2: Prior to issuing of grading or building permits, a registered Geotechnical engineer and structural engineer shall be hired to oversee the construction of the Project. A final geotechnical analysis of the site shall be prepared, and site preparation and construction requirements shall be outlined. The final Geotechnical Report and any recommendations made by the Registered Geotechnical Engineer and/or Structural Engineer shall be reviewed and approved by the Lead Agency prior to the start of grading or construction. These include but are not limited to:

1. Earthwork in accordance with Appendix J of the 2016 CBC.
2. Removal of vegetation, organic rich soils (>2%) from the grading area.
3. Over-excavation of subgrade in areas of planned buildings, building pads, asphalt pavement or concrete flatwork.
4. Review of over-excavation/scarification by a registered Geotechnical engineer.

5. Removal of expansive soils with the replacement of non-expansive soils.
6. Use of lime treatment on expansive soils in lieu of removal/replacement of soils.
7. Inspection of imported fill materials to meet specific criteria regarding particle size, maximum expansion, plasticity, minimum R-value of 45 (in paved areas), soluble sulfates and chlorides and soil resistivity.
8. The use of bedding material such as sand to protect buried utilities and pipes.
9. Retaining structures shall be designed to resist a lateral active earth pressure of 40 pcf.
10. The use of spread footings and/or continuous wall footings shall be utilized, as recommended by the registered Geotechnical engineer or Structural Engineer.
11. Light poles, signs or canopies shall be designed with in accordance with Section 1807.2 of the 2016 CBC.
12. The Registered Geotechnical Engineer and/or Structural Engineer shall be on to observe all construction activities as is deemed necessary.
13. Concrete floors shall be a minimum four inches in thickness. Reinforcement of concrete slab-on-grade floors shall include at least #3 bars spaced 24 inches on center in both directions. Moisture vapor retarder/barrier shall be installed beneath all slabs-on-grade that would be covered with flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist.
14. Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls.
15. Backdrains should be installed behind all retaining walls exceeding 3 feet in height.
16. Use of alternate combinations of cementitious materials shall be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.
17. Buried metal conduits shall have a protective coating in accordance with the manufacturer's specifications. A corrosion specialist shall be consulted if more detailed recommendations are required.
18. Prior to paving, the subgrade shall be prepared in at a minimum:
 - a. The upper 8 inches of subgrade soils shall be compacted to at least 95% relative compaction.

19. All aggregate base (AB) courses shall be moisture conditioned to within 2% of optimum moisture content and shall be compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements shall be specified by the Project Civil Engineer.

20. Other requirements based on the professional judgement of the Registered Geotechnical Engineer and/or Structural Engineer.

MM-GEO-3 Prior to the issuance of grading or building permits, the Project geotechnical engineer, structural engineer, civil engineer, general contractor, the earthwork contractor shall meet with the Lead Agency to discuss the grading plan and grading requirements as outlined in the final Geotechnical Report.

MM GEO-4 During construction activities, the geotechnical engineer shall provide observation and testing during the following stages of grading:

1. During the clearing and grubbing of the site.
2. During the demolition of any existing structures, buried utilities or other existing improvements.
3. During excavation and over-excavation of existing subgrade.
4. During all phases of grading including ground preparation and filling operations.
5. When any unusual conditions are encountered during grading.
6. A grading and compaction report summarizing conditions encountered during grading and the in-place density testing that was performed shall be submitted upon completion of the earthwork construction. A copy of this report shall be submitted to the Lead Agency.

MM GEO-5 After the completion of grading, the geotechnical engineer shall provide additional observation and testing during the following construction activities:

1. During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
2. After excavation and prior to placement of reinforcing steel or concrete within footing excavations to verify that footings are properly founded in competent materials.
3. During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
4. When any unusual ground or soil conditions are encountered during construction.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.7e – Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

The proposed Project will not use septic systems but will connect to the existing city of Avenal wastewater sewer line/system.

Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*

Impact #3.4.7f – Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Geological records of the region and those prepared for the Avenal General Plan 2025 EIR, found no evidence of paleontological resources or unique geological features in Avenal. However, there is a possibility that future ground disturbing activities could cause damage to, or destruction of, previously undiscovered paleontological resources or unique geologic features.

Implementation of MM GEO-6 would reduce potential impacts to a less than significant level. In addition, the Avenal General Plan 2035 policies and guidelines direct the City to require construction to stop immediately if cultural resources, including tribal, archaeological or paleontological resources, are uncovered during grading or other on-site excavation activities, until appropriate mitigation is implemented. Implementation of proposed Policy NR-5.2 would protect paleontological resources. Therefore, with MM GEO-8 the Project will have a less than significant impact.

Mitigation Measure(s)

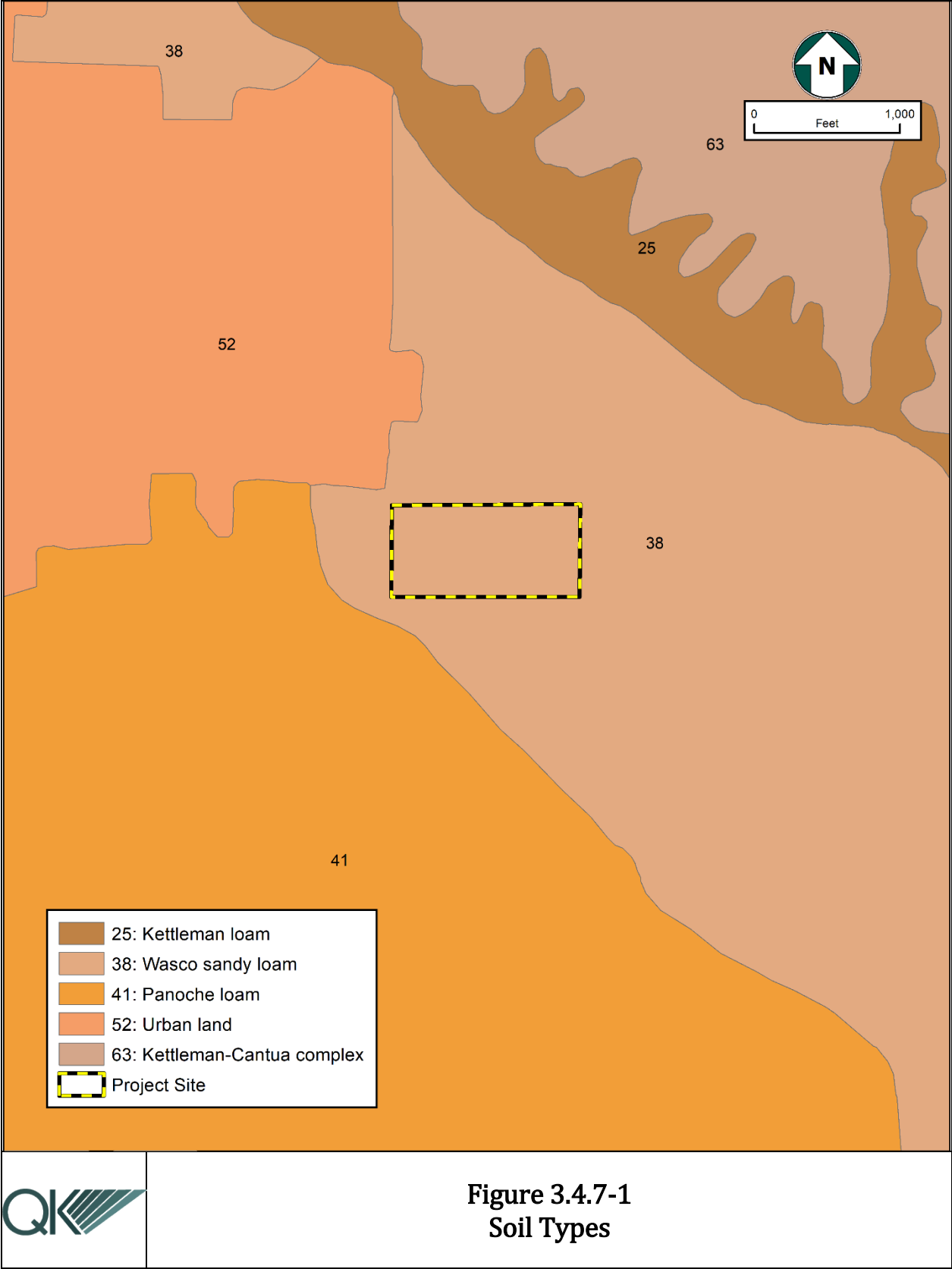
MM GEO-6: If any paleontological resources are encountered during ground disturbance activities, all work within 25 feet of the find shall halt until a qualified paleontologist as defined by the Society of Vertebrate Paleontology Standard Procedures for the Assessment

and Mitigation of Adverse Impacts to Paleontological Resources (2010), can evaluate the find and make recommendations regarding treatment. Paleontological resource materials may include resources such as fossils, plant impressions, or animal tracks preserved in rock. The qualified paleontologist shall contact the Natural History Museum of Los Angeles County or other appropriate facility regarding any discoveries of paleontological resources.

If the qualified paleontologist determines that the discovery represents a potentially significant paleontological resource, additional investigations and fossil recovery may be required to mitigate adverse impacts from Project implementation. If avoidance is not feasible, the paleontological resources shall be evaluated for their significance. If the resources are not significant, avoidance is not necessary. If the resources are significant, they shall be avoided to ensure no adverse effects, or such effects must be mitigated. Construction in that area shall not resume until the resource appropriate measures are recommended or the materials are determined to be less than significant. If the resource is significant and fossil recovery is the identified form of treatment, then the fossil shall be deposited in an accredited and permanent scientific institution. Copies of all correspondence and reports shall be submitted to the Lead Agency.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.



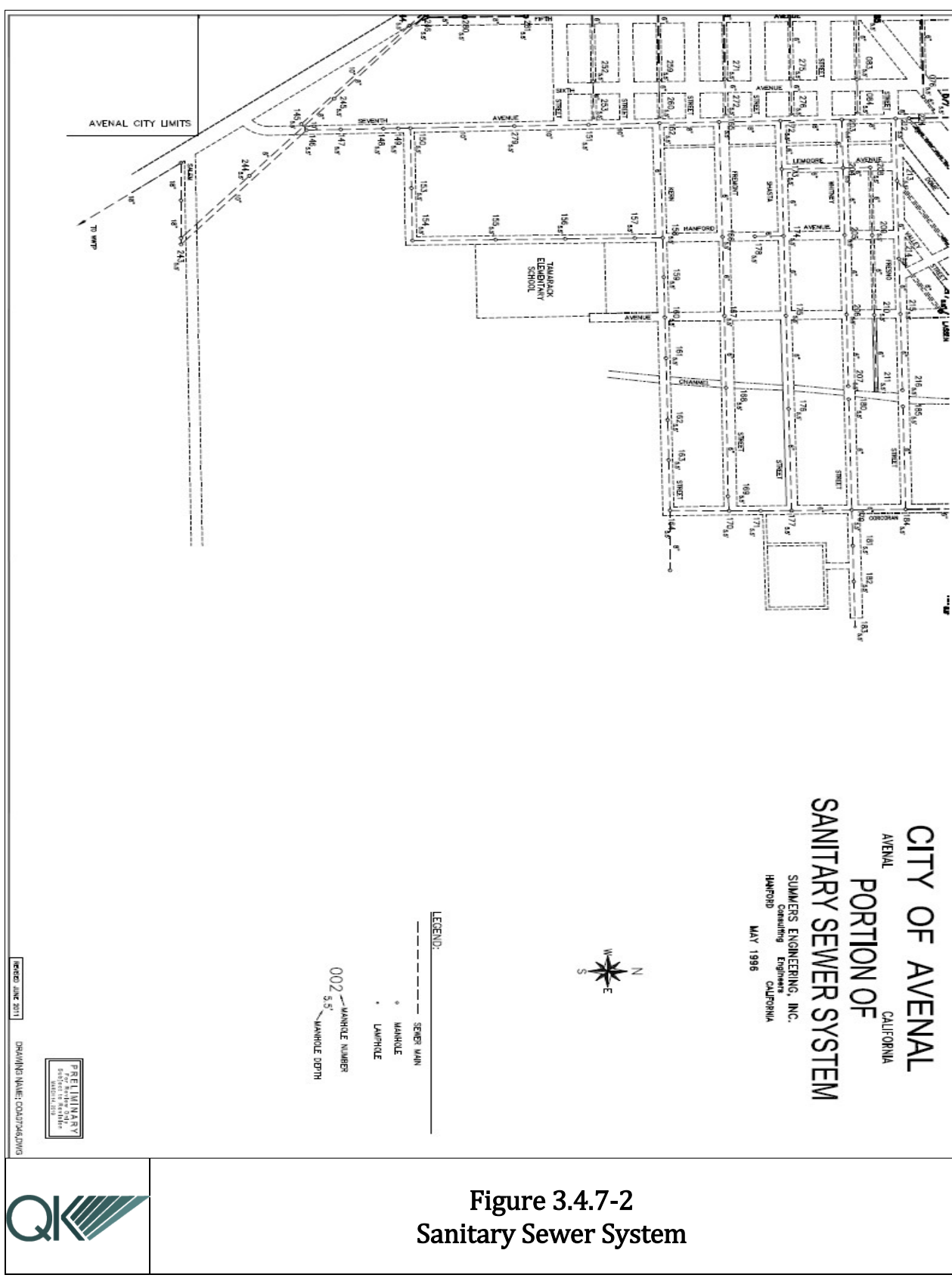
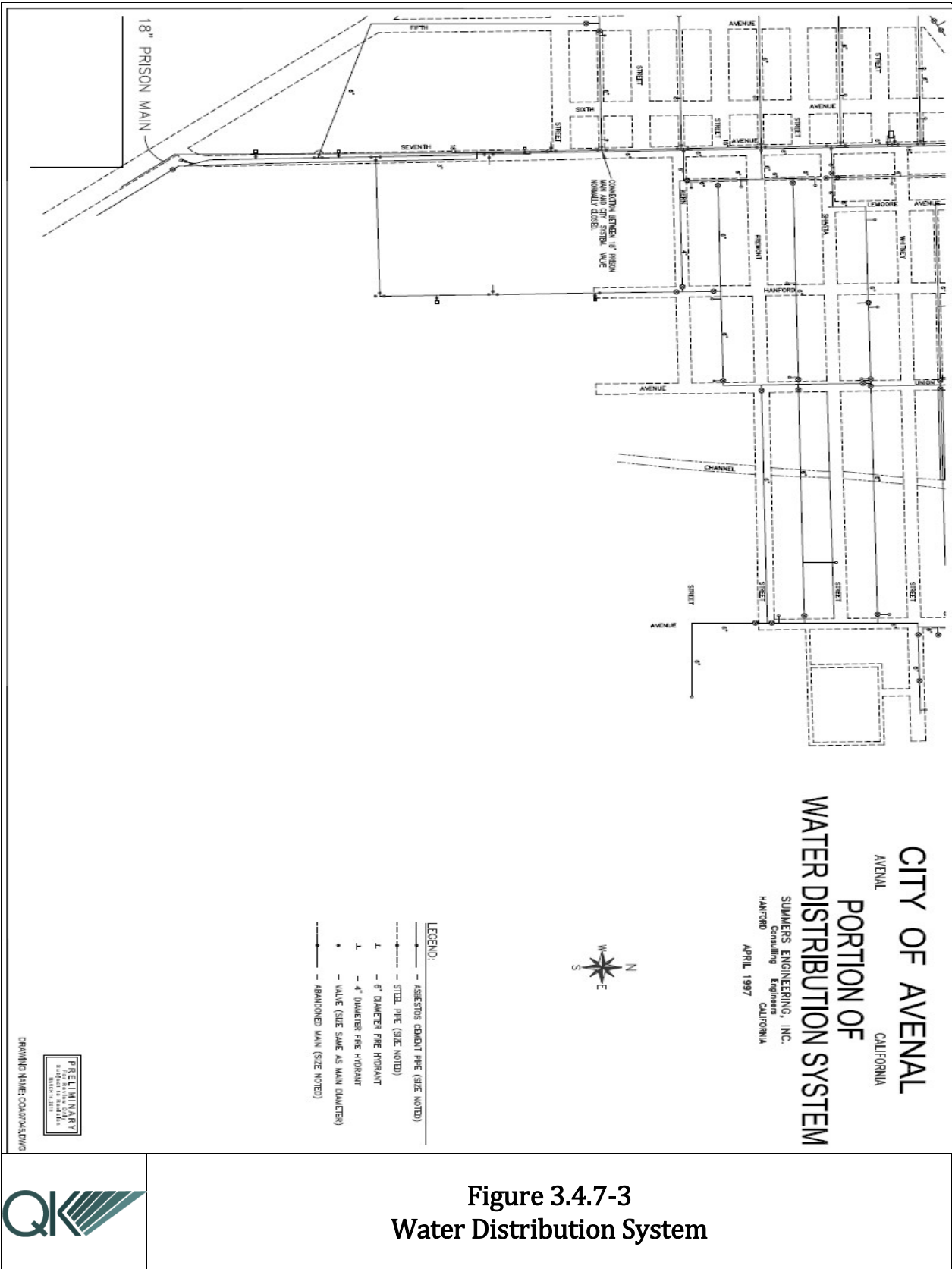


Figure 3.4.7-2
Sanitary Sewer System



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.8 - GREENHOUSE GAS EMISSIONS

Would the Project:

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Discussion

Analysis of Greenhouse Gases is based on the Small Project Analysis Level Assessment (SPAL) prepared for the Project (Insight Environmental , 2019), which is included as Appendix A.

Impact #3.4.8a – Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Although construction of the proposed Project would result in temporary emissions of GHGs, the Project as a whole is not expected to generate greenhouse gas emissions, either directly or indirectly that may have a significant impact on the environment. The Project GHG emissions are primarily from mobile source activities. The proposed Project's operational CO₂e emissions were estimated using CalEEMod. These emissions are summarized in Table 3.4.8-1.

Table 3.4.8-1: Estimated Annual Greenhouse Gas Emissions

	CO ₂ Emissions metric tons	CH ₄ Emissions metric tons	N ₂ O Emissions metric tons	CO ₂ e Emissions metric tons
2021 Project Operations	2,152.0	1.87	0.014	2,203.0
2005 BAU	3,748.5	2.79	0.013	3,822.2
BAU less Project emissions				42.4%

Source: (Insight Environmental , 2019)

The amount of CO₂e emissions that would be generated by the Project (2,203.0 metric tons-per-year) is so small in relation to the California CO₂e estimates for 2020 (596 million CO₂e) that it's not possible for the contribution of the Project to be cumulatively considerable (Insight Environmental , 2019). Additionally, the Project's GHG emissions are less than the 2005 business-as-usual emissions for the Project by 1,619.2 metric tons-per-year of CO₂e,

which is a 42.4% reduction (Insight Environmental , 2019). Therefore, the Project would not generate a cumulatively considerable GHG impact nor would it conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The Project will also not conflict with any elements of the California Air Resources Board's 2008 Climate Change Scoping Plan. Therefore, the Project would have a less than significant impact.

See also Impact 3.4.3a.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.8b – Would the Project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

See Impact #3.4.8a above. The proposed Project will not exceed the SPAL GHGs established by the SJVAPCD. Therefore, the Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3.4.9 - HAZARDS AND HAZARDOUS MATERIALS				
Would the Project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

This section is based on the Phase 1 Environmental Site Assessment (ESA) prepared for the Project (See's Consulting & Testing, Inc., 2019) , which is included as Appendix D of this document.

Impact #3.4.9a – Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction of the Project would involve the temporary transport and use of minor quantities of hazardous materials such as fuels, oils, lubricants, hydraulic fluids, paints and solvents. The types and quantities of hazardous materials to be used and stored onsite would not be of a significant amount to create a reasonably foreseeable upset or accident condition. The handling and transport of all hazardous materials onsite would be performed in accordance with all applicable federal, State, and local laws and regulations.

Hazardous and non-hazardous wastes would likely be transported to and from the Project site during the construction phase of the proposed Project. Construction would involve the use of some hazardous materials, such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products, although these materials are commonly used during construction activities and would not be disposed of on the Project site. Workers would be trained to properly identify and handle all hazardous materials. Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. Any hazardous waste or debris that is generated during construction of the proposed Project would be collected and transported away from the site and disposed of at an approved off-site landfill or other such facility. In addition, sanitary waste generated during construction would be managed through the use of portable toilets, which would be located at reasonably accessible on-site locations. Hazardous materials such as paint, bleach, water treatment chemicals, gasoline, oil, etc., may be used during construction. These materials are stored in appropriate storage locations and containers in the manner specified by the manufacturer and disposed of in accordance with local, federal, and State regulations. no significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous waste during construction or operation of the new residential development would occur.

Residential construction generally use fewer hazardous chemicals or use chemicals in relatively small quantities and concentrations as compared to commercial or industrial uses. In addition, once the Project is completed, the chemicals used would include minor quantities of pesticides/ rodenticides, fertilizers, paints, detergents, and other cleaners.

Once constructed, the use of such materials such as paint, bleach, etc, are considered common for residential developments and would be unlikely for such materials to be stored or used in such quantities that would be considered a significant hazard.

MITIGATION MEASURE(S)

No mitigation required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.9b – Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

See discussion on Impact #3.4.8a, above.

Although there are active DOGGR identified oil or gas fields in the area surrounding the City of Avenal, there are no known existing or historical oil wells on the Project site. The nearest oil/gas field in relation to the Project is the Kettleman North Dome oil fields that are located approximately half a mile to the northeast of the Project site. There is a capped well within one mile to the southeast of the site. Both the capped well and the nearby Kettleman North Dome oil fields will not be affected by the Project. Should an unknown well be discovered on the Project site during construction, the Project will comply with Mitigation Measure MM HAZ-1 to reduce potential impacts.

The completed residential Project will not create significant hazards to the public or the environment through a reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, with implementation of MM HAZ-1 the Project impacts will be less than significant.

The Project involves the construction of residential homes and will not be involved in the storage or stockpiling of significant levels of hazardous materials. The Project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

MM HAZ-1: In the event that other abandoned or un-recorded wells are uncovered or damaged during excavation or grading activities, all work shall cease and the California Department of Conservation, Division of Oil, Gas and Geothermal Resources shall be contacted for requirements and approvals. The California Department of Conservation, Division of Oil, Gas and Geothermal Resources may determine that remedial plugging operations may be required. All correspondence shall be submitted to the Lead Agency.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.9c – Would the Project emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

See Impact #3.4.8a and b, above.

The nearest school is Tamarack Elementary School, located approximately a quarter of a mile to the west of the Project site. Construction activities of the proposed Project will result in the temporary use of hazardous materials and or substances, such as lubricant, diesel fuel during construction. Exhaust from construction and related activities are expected to be minimal and not significant. Once constructed, the residential Project is not expected to result in hazardous emissions. Therefore, impacts would be less than significant

MITIGATION MEASURE(S)

No mitigation required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.9d – Would the Project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

An online search was conducted of Cortese List to identify locations on or near the Project site. The search indicated that there are no hazardous or toxic sites in the vicinity (within one mile) of the Project site (Cal EPA, 2019). There are no known Permitted Underground Storage Tanks, Leaking Underground Storage Tanks, or any other cleanup sites on or in the vicinity (within one mile) of the Project site (California Water Resources Board, 2019).

The Project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment. The Project site is not within the immediate vicinity of a hazardous materials site and would not impact a listed site. Literature review of available federal, State, and local database information systems was performed for the purpose of identifying known recognized environmental conditions present on the site and the nearby properties that have the potential to adversely impact the site. There is no data identifying any facilities in the vicinity that might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials, substances, or wastes that might affect the proposed residential development. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.9e – For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?

There are no public airports in Avenal; the closest public airport is Colinga Municipal Airport, approximately 20 miles northeast of the Project. Therefore, the Project would not result in a safety hazard or excessive noise for people residing in the Project area and there would be no impacts.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.9f – Would the Project Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

The 2015 Kings County Emergency Operations Plan (EOP) establishes emergency procedures and policies and identifies responsible parties for emergency response in the County (Kings County, 2015). The EOP includes policies that would prevent new development from interfering with emergency response of evacuation plans. The Project will comply with all local regulations related to the construction of new development that is consistent with the EOP.

Additionally, the proposed Project is required to adhere to the standards set forth in City of Avenal the Uniform Fire Code (Ordinance No. 87-04), which identifies the design standards for emergency access during both the Project's construction and operational phases (City of Avenal , 1988). The Project would also comply with the appropriate local and State requirements regarding emergency response plans and access. The proposed Project would not inhibit the ability of local roadways to continue to accommodate emergency response and evacuation activities.

The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.9g – Would the Project Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

According to available data from Cal Fire, the entire City of Avenal including the Project site is within a Local Responsibility Area (LRA). Within the LRA the areas to the northeast of Project site have been classified as both high and moderate fire hazard severity zones (Cal Fire, 2007). The General Plan includes policies that would protect the Project and the community from fire dangers. These include the installation of fire safety devices in all homes and meeting required fire standards.

Construction activities and the Project is not expected to increase the risk of wildfires on and adjacent to the Project site. The Project will comply with all applicable State and local building standards as required by local fire codes. In addition, to reduce the impacts to the fire protection services, Mitigation Measure MM HAZ-2 would require the Project to pay appropriate impact fees.

MITIGATION MEASURE(S)

MM HAZ-2: Prior to the issuance of grading or building permits, the Project developer shall pay \$1,942.51 for every single family unit being built in compliance with the Kings County Adopted Public Facilities Fees to offset the increased costs associated with the provision of additional Fire Protection services. Evidence of payment shall be submitted to the City of Avenal Community Development Department.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with incorporation of mitigation*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3.4.10 - HYDROLOGY AND WATER QUALITY				
Would the Project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Substantially increase the rate of amount of surface runoff in a manner which would result flooding on- or offsite?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Impede or redirect flood flows?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? ☐ ☐ ☒ ☐

Discussion

This section is based on information from the City of Avenal USBR Water Management Plan (City of Avenal, 2016).

Impact #3.4.10a – Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality?

Construction of the Project would involve excavation, soil stockpiling, mass and fine grading, the installation of supporting drainage facilities, and associated infrastructure. During site grading and construction activities, large areas of bare soil could be exposed to erosive forces for long periods of time. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling and grading activities could result in increased erosion and sedimentation to surface waters.

As noted in Impact #3.4.7b, accidental spills or disposal of potentially harmful materials used during construction could possibly wash into and pollute surface water runoff. Materials that could potentially contaminate the construction area, or spill or leak, include lead-based paint flakes, diesel fuel, gasoline, lubrication oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids. In order to reduce potential impacts to water quality during construction activities, the Project SWPPP would include BMPs targeted at minimizing and controlling construction runoff and erosion to the maximum extent practicable. SWPPP for construction-related activities would include, but not be limited to, the following types of BMPs to minimize the potential for pollution related to material spills:

- Vehicles and equipment will be cleaned.
- Vehicle and equipment fueling, and maintenance requirements will be established.
- A spill containment and clean-up plan will be in place prior to and during construction activities.

With implementation of MM GEO-1 the proposed Project would not violate any water quality standards or degrade surface water quality, and impacts would be less than significant.

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM GEO-1

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.10b – Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?

See also Impact #3.4.19b.

There are two main groundwater subbasins that underlie the City of Avenal: the Pleasant Valley Subbasin and the Westside Subbasin. The central portion of the City does not have a designated groundwater basin. Depth to groundwater in the vicinity of Avenal is approximately 1,000 feet below ground surface (bgs) (City of Avenal, 2018a).

The 227- square-mile Pleasant Valley subbasin lies along the west side of the San Joaquin Valley and is surrounded by the Coast Ranges and west flank of the Kettleman Hills. The subbasin includes the older and younger alluvium of the San Joaquin Valley.

Recharge is primary from seepage from various streams that cross the subbasin and is estimated at 4,000 acre-feet per year. With a high amount of total dissolved solids (TDS) in the groundwater, ranging from 1,000 to 3,000 mg/l with an average of 1,500 mg/l, limits the usefulness of groundwater (City of Avenal, 2018a). It is also noted that the City does not have a formal groundwater recharge/management/banking program other than natural recharge (City of Avenal, 2016).

Because of the poor groundwater quality that has high concentrations of sulfate, nitrates, and sodium Avenal does not use groundwater as a water supply source. The City does pump a small quantity of groundwater from a City-owned well for irrigation of the sports complex. The amount varies depending on irrigation needs but the pumped groundwater is not suitable for human consumption (City of Avenal, 2018a). The water purveyor for the Project area is the City of Avenal, supplied solely via the San Luis Canal (City of Avenal, 2018a). The Project intends to connect to the existing water distribution system (see Figure 3.4.10-1).

The Project's expected water usage was calculated using the following assumptions. A person is estimated to use approximately 60 gallons per day (gpd) of water (Grace Communication Foundation, 2019). It was assumed that a typical family household consists of four people. Based on this estimate, the Project is anticipated to use approximately 10.6 million gallons (60 gpd x 4 people x 365 days x 122 homes), or 32.8 acre feet (AF) of water annually.

As outlined in the adopted City of Avenal Water Management Plan, a number of water conservation measures were enacted to reduce overall water consumption in the City. At this time, it appears there is sufficient potable water available to service the Project. See Figures 3.4.10-1 for the Water Distribution System connections.

The City has planned for growth by calculating out a requirement of 433 acres of additional residential land to meet the required 320.7 additional residences by 2020 and approximately 433 residences by 2025 to house their expected population (City of Avenal, 2018a). The City has analyzed the water needed to meet the increased water usage. The proposed Project will

not substantially deplete aquifer supplies or interfere substantially with groundwater recharge or significantly alter local groundwater supplies.

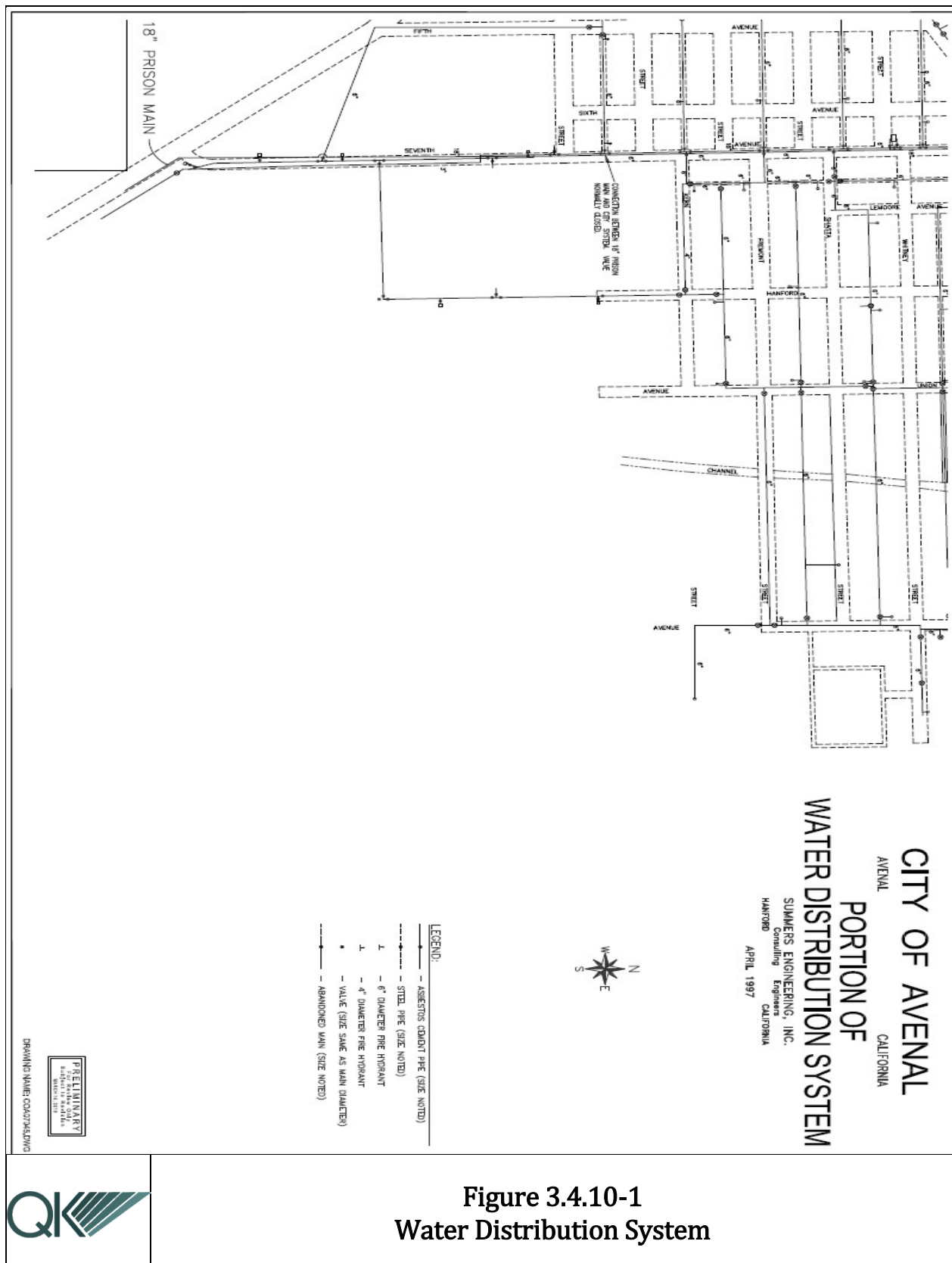
Based on the calculated amount of water used and the anticipated surface water use, , the proposed Project is not expected to result in a substantial decrease of groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.



Impact #3.4.10c(i) –Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site?

The rate and amount of surface runoff is determined by multiple factors, including the following: topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed and the amount of precipitation and water that infiltrates to the groundwater. The proposed Project would alter the existing drainage pattern of the site, which would have the potential to result in erosion, siltation, or flooding on- or off-site. The disturbance of soils on-site during construction could cause erosion, resulting in temporary construction impacts. In addition, the placement of permanent structures on-site could affect drainage in the long-term. Impacts from construction and operation are discussed below.

As discussed in Impact #3.4.10a. above, potential impacts on water quality arising from erosion and sedimentation are expected to be localized and temporary during construction. Construction-related erosion and sedimentation impacts as a result of soil disturbance would be less than significant after implementation of an SWPPP (see Mitigation Measure MM GEO-1) and BMPs required by the NPDES. No drainages or other water bodies are present on the Project site, and therefore, the proposed Project would not change the course of any such drainages.

Existing drainage pattern of the site and area would be affected by Project development because of the increase in impervious surfaces at the site. The Project design includes natural features such as landscaping and vegetation that would allow for the percolation of stormwater. However, there will be an addition in impervious surfaces (houses, driveways, roadways, etc), which could increase the potential for stormwater runoff and soil erosion. The construction of the Project would require the connection to existing City stormwater sewer infrastructure. The Project will comply with all applicable local building codes and regulations in order to minimize impacts during construction and post-construction of the Project. With implementation of MM GEO-1 impacts that would result in substantial erosion or siltation on- or off-site is less than significant

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated.*

Impact #3.4.10c(ii) – Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate of amount of surface runoff in a manner which would result flooding on- or offsite?

See also Impact #3.4.9c, above.

The Project site is flat and grading would be minimal. The topography of the site would not change because of grading activities. The site does not contain any water features, streams or rivers. The Project would develop significant areas of impervious surfaces that could significantly reduce the rate of percolation at the site or concentrate and accelerate surface runoff in comparison to the baseline condition. However, on-site storm drainage infrastructure is required as a condition of approval of the Tentative Tract Map. Any storm runoff would connect to the existing City of Avenal sewer system. An existing City sewer line is located approximately 50 feet north of the Project site.

The Project is not within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, the Project outside of a 100-year flood zone (see Figure 3.4.10-2). The Project site is located within the FEMA Flood Hazard Zone X: Area of Minimal Flood Hazard, and therefore the potential for flooding at the site appears to be very low. The General Plan also includes policies that restricts residential development in floodplains and requires that homes be constructed to be at least one foot above freeboard of the 100-year flood levels. The Project would comply with all City codes and regulations related to flooding.

MM GEO-1 requires the development of a SWPPP and the use of BMPs and limit the amount of grading where feasible to reduce impacts to water quality during construction. Once constructed, stormwater would be directed to flow into the existing stormwater sewer system. The Project would not cause substantial surface runoff that would result in flooding on- or off-site. Therefore, with mitigation, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM GEO-1

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.10c(iii) – Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Please see Impacts #3.4.10a through c (ii), above.

The Project would comply with all applicable State and local codes and regulations. The proposed Project includes the construction of stormwater infrastructure necessary to connect the new residential development. Therefore, the Project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater

drainage systems or provide substantial additional sources of polluted runoff. Impacts would be less than significant.

With implementation of MM GEO-1 as noted above, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, nor provide additional sources of polluted runoff. Therefore, with mitigation, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.10c(iv) – Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?

As discussed above in Impact #3.4.10 a through c (iii), construction activities could potentially degrade water quality through the occurrence of erosion or siltation at the Project site.

Construction of the Project would include soil-disturbing activities that could result in erosion and siltation, as well as the use of harmful and potentially hazardous materials required to operate vehicles and equipment. The transport of disturbed soils or the accidental release of potentially hazardous materials could result in water quality degradation. The Project would be required comply with the NPDES Construction General Permit. A SWPPP would be prepared to specify BMPs to prevent construction pollutants as required by MM GEO-1. The proposed Project would not otherwise substantially degrade water quality. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.10d – Would the Project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

The Project site is not located near the ocean or a steep topographic feature (i.e., mountain, hill, bluff, etc.). Tsunamis are waves generated in oceans from seismic activity. Due to the

inland location of the site, tsunamis are not considered a hazard for the site. Therefore, there is no potential for the site to be inundated by tsunami or mudflow.

A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. There is no body of water within the vicinity of the Project site. There is no potential for inundation of the Project site by seiche.

See also Impact #3.4.10 c(ii).

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.10e – Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

See response to Impact #3.4.10b above.

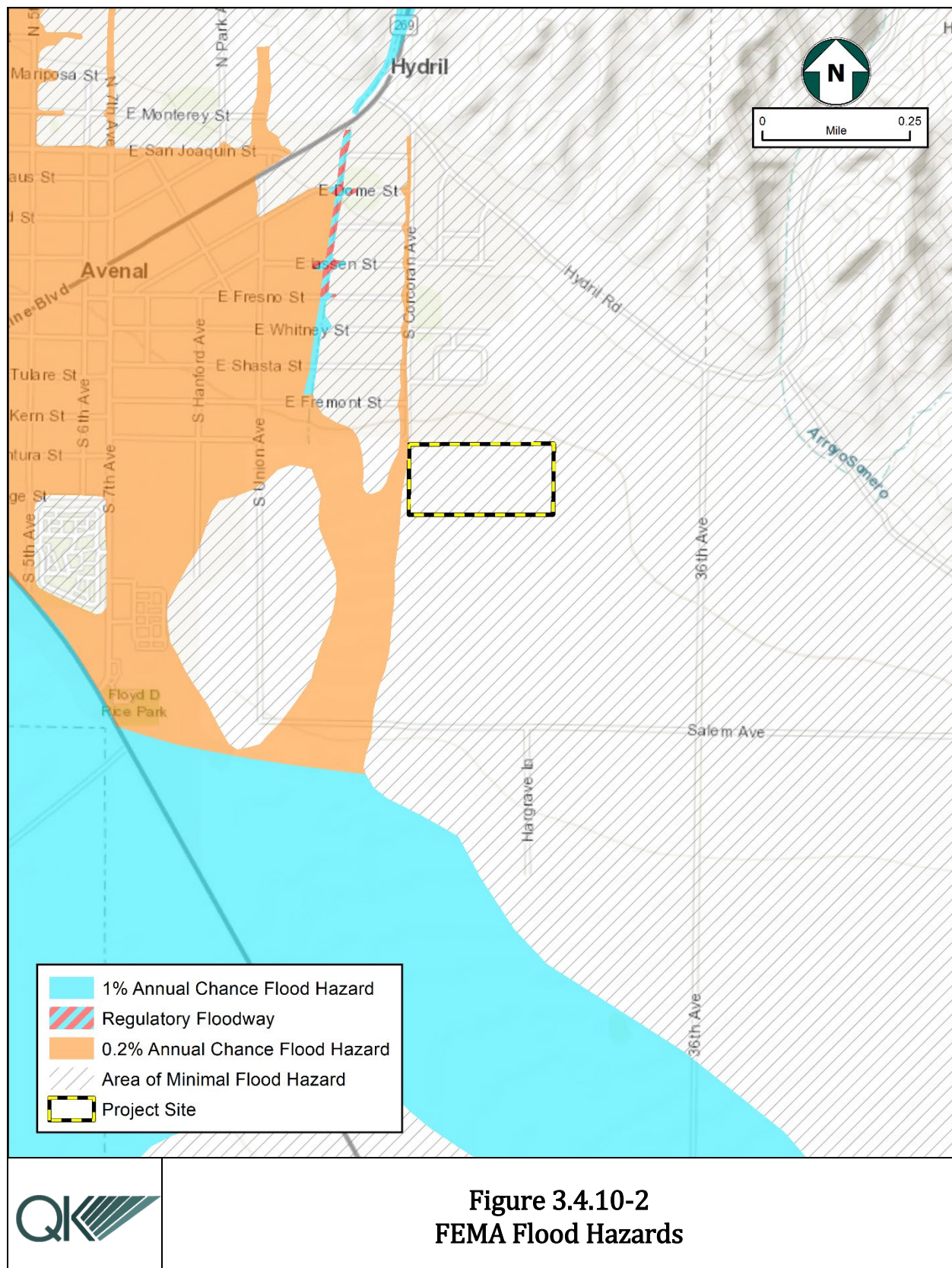
As the City of Avenal does not use groundwater resources to provide potable water to the City residents, this Project is not anticipated to use or substantially deplete groundwater supplies, or conflict with any future adopted groundwater management plan. Therefore, this Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.11 - LAND USE AND PLANNING

Would the Project:

- | | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a. | Physically divide an established community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Discussion

Impact #3.4.11a – Would the Project physically divide an established community?

The proposed Project site is presently undeveloped land and is surrounded by undeveloped land to the east and south, and residential development to the north. Surrounding agricultural lands in the area are in the process of being converted to residential uses as envisioned by the General Plan. The proposed Project would not physically divide an established community. Therefore, the Project will have a no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Impact #3.4.11b – Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The Project is within the jurisdictional boundaries of the City of Avenal General Plan, which designates the Project site as Community Commercial, High Density Residential, and Park. The proposed Project includes a General Plan Amendment to R-1 that would allow for the residential development of 122 single family homes. The City has planned for growth by calculating out a requirement of 433 acres of additional residential land to meet the required 321 additional residences by 2020 and approximately 433 residences by 2025 to house their expected population (City of Avenal, 2018a).

The proposed residential development of higher density multi-family homes, as well as impacts from commercial development was already anticipated and analyzed by the General Plan EIR. With approval of the General Plan Amendment, the development of 122 single family residences will help the City meet the housing needed. However, the Project will result in less impacts than those originally anticipated. As such, the proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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3.4.12 - MINERAL RESOURCES

Would the Project:

- | | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a. | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Discussion

Impact #3.4.12a – Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The California Department of Conservation, Geological Survey classifies lands into Aggregate and Mineral Resource Zones (MRZs) based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1974. These MRZs identify whether known or inferred significant mineral resources are present in areas. Lead agencies are required to incorporate identified MRZs resource areas delineated by the State into their General Plans. The State has not identified any mineral resources zones within the Avenal planning area (City of Avenal, 2018).

However, oil and gas resources have been identified in and extracted from properties in the vicinity of the Project. As illustrated in Figure 3.4.12-1, the Project site is not located in a Division of Oil, Gas and Geothermal Resources (DOGGR) identified oilfield and there are no known wells located on the site. The closest oil well is located approximately 2,700 feet to the south of the Project. The proposed Project would not result in the loss of availability of mineral resources as the Project does not propose the extraction of mineral resources. Additionally, the proposed Project would not restrict the ability of mineral rights' holders in the area to exercise their legal rights to access surrounding sites for the exploration and/or extraction of underlying oil research or other natural resources.

The proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.12b – Would the Project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

As seen in Figures 3.4.12-1 and in the General Plan, the proposed Project is not designated as a mineral recovery area. The Project would not alter any existing plans that protect mineral resources. As a result, the proposed Project would not interfere with known mining operations but would not result in the loss of land designated for mineral and petroleum.

The proposed Project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.13 - NOISE

Would the Project result in:

- | | | | | | |
|----|--|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| a. | Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. | Generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion

The 2035 Avenal General Plan and the General Plan Enhancement Initial Study were used for discussion for this section.

Impact #3.4.13a – Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?

The General Plan provides direction for the noise environment for the Project and identifies the policy for land uses that may generate noise and sensitive land uses that may be affected by noise generated elsewhere. Schools, residences, churches, and hospitals are identified as sensitive land uses. The General Plan Policy is to provide noise considerations into the land use decision-making process.

The existing major sources of noise within the City are Highway 269 and Avenal Regional Landfill. The Project site is not located in the immediate vicinity of these identified noise sources. Policy SAF-5.3 directs that effective mitigation measures to be incorporated into the

design of residential projects to reduce exterior noise levels to 65 dB Ldn (or CNEL) or less and 45 dB Ldn (or CNEL) or less within interior living spaces within 65 dB Ldn existing or future noise contours (City of Avenal, 2018). The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation.

There are a number of nearby residences and other sensitive receptors and neighbors within 30-feet of the north side of the Project. Tamarack Elementary School and two health centers are within a one-mile radius of the Project.

Construction related noise levels and activities will be temporary and intermittent. The proposed Project will generate noise from the following construction equipment: graders, bulldozers, tractors, loaders and loaded trucks, excavators, graders, scrapers, forklifts, generators, cranes, pavers, rollers, compactors and air compressors. Additionally, traffic and the various other noises generally associated with construction activities will be temporary and only take place during daylight hours. In addition, the construction-related noise will be intermittent and cease once the proposed Project is completed. The residences to the north of the Project across South Corcoran Avenue and east Kern Street could be affected by noise from construction related activities.

Post-Construction

Once constructed, the Project will increase traffic on local roadways. Residential activities could also result in an increase in ambient noise levels in the immediate Project vicinity. Activities that could be expected to generate noise include cars entering and exiting the development, as well as mechanical systems related to heating, ventilation, and air conditioning systems located on residential buildings. However, noise emanating from residences would be similar to those generated by the nearby existing residential development and would not be of a level that exceeds thresholds.

Implementation of the Mitigation Measure MM NSE-1 will reduce the temporary noise impacts from construction related activities to levels that will be less than significant.

MITIGATION MEASURE(S)

MM NSE-1: During construction, the contractor shall implement the following measures:

1. All stationary construction equipment on the Project site shall be located so that noise emitting objects or equipment faces away from any potential sensitive receptors.
2. The construction contractor shall ensure that all construction equipment is equipped with manufacturer-approved mufflers and baffles. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.
3. Construction activities shall take place during daylight hours, when feasible.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.13b – Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities in general can have the potential to create groundborne vibrations. However, based on the soil types found in the general Project vicinity, it is unlikely that any blasting or pile-driving would be required in connection with construction of the school. Therefore, the potential for groundborne vibrations to occur as part of the construction of the Project is considered minimal.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations (Federal Highway Administration (FHWA), U.S. Department of Transportation, 2017). In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 inch/second) appears to be conservative even for sustained pile driving. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. The typical vibration produced by construction equipment is illustrated in Table 3.4.13-1.

Table 3.4.13-1. Typical Vibration Levels for Construction Equipment

Equipment	Reference peak particle velocity at 25 feet (inches/second) ¹	Approximate peak particle velocity at 100 feet (inches/second) ²
Large bulldozer	0.089	0.011
Loaded trucks	0.076	0.010
Small bulldozer	0.003	0.0004
Jackhammer	0.035	0.004
Vibratory compactor/roller	0.210	0.026

Notes:

1 – Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006. Table 12-2.

2 – Calculated using the following formula:

$$PPV_{\text{equip}} = PPV_{\text{ref}} \times (25/D)^{1.5}$$

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines

D = the distance from the equipment to the receiver

As indicated in Table 3.4.13-1, based on the FTA data, vibration velocities from typical heavy construction equipment that would be used during Project construction range from 0.003 to 0.644 inch-per-second peak particle velocity (PPV) at 25 feet from the source of activity. With regard to the proposed Project, ground-borne vibration would be generated during site clearing and grading activities on-site facilitated by implementation of the proposed Project. As demonstrated in Table 3.4-13-1, vibration levels at 100 feet would range from 0.0004 to 0.026 PPV. Therefore, the anticipated vibration levels would not exceed the 0.2 inch-per-second PPV significance threshold during construction operations at the nearest receptors, which are approximately 300 feet to the east. It should be noted that 0.2 inch-per-second PPV is a conservative threshold, as that is the construction vibration damage criteria for non-engineered timber and masonry buildings (Kern County Planning Department, 2013). Buildings within the Project area would be better represented by the 0.5 inch-per-second PPV significance threshold (construction vibration damage criteria for a reinforced concrete, steel or timber buildings) (Kern County Planning Department, 2013). Therefore, vibration impacts associated with construction are anticipated to be less than significant.

Post Construction

Once constructed, the Project would not result in any activities that would create groundborne vibrations. The proposed Project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Therefore, the Project would have a no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.13c – For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The Project is located within two miles of the nearby private Avenal airstrip/airport. There are no public airports within the vicinity of Avenal and no local airport land use plans have

been adopted by the City of Avenal. The Project would not expose people residing or working in the Project area to excessive noise levels.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.14 - POPULATION AND HOUSING

Would the Project

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion

Impact #3.4.14a – Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The population of Avenal is currently 13,218 and the City is projected to reach approximately 13,947 by 2020 and 16,039 by 2025. To meet the housing demand for 2020 and 2025 the City has planned for growth by calculating out a total requirement of 433 acres of additional residential land. According to Tables 1.1-3 and 1.1-4 of the Avenal 2035 General Plan, the City will need 320.7 residences by 2020 and approximately 433 residences by 2025 to house their expected population (City of Avenal, 2018a). Figure 1.1-4 from the Avenal General Plan (page 122), illustrates the land available for development in the City and Planned Area. This includes land that is either currently vacant or undeveloped and agricultural land. The Project is within the area identified as Available for Development. The proposed Project is comprised of 18.65 acres and 122 residences; using the average household size of 4.5 people, the Project will house approximately 505 people and be within the range of projected growth within the City.

The Project is not expected to result in other substantial unplanned population growth in an area, either directly (by proposing new homes and businesses) or indirectly (through extensions of roads or other infrastructure). Therefore, Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.14b – Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

See Impact#3.4.14a above.

Construction of the Project would likely be done by construction workers residing in the City or the surrounding area; they would not require new housing. The Project site is undeveloped and will not displace existing people or housing, necessitating the construction of replacement housing elsewhere. Therefore, the Project would have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be *no impact*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.15 - PUBLIC SERVICES

Would the Project:

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services:

(i) Fire protection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(ii) Police protection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iii) Schools?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iv) Parks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(v) Other public facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

Impact #3.4.15a(i) – Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services - Fire Protection?

Fire protection for the Project is provided by the Kings County Fire Department augmented with a local volunteer force. The County maintains Fire Station 12 at 516 E. Fresno Street in Avenal with three Captains, three engineers, and two personnel on duty at all times; the station is contracted with the City of Avenal and the surrounding southwest portion of the County. Station 12 maintains two engines. The County also has Station 9 at 85 Brown Street in Kettleman City, fifteen miles east of Avenal; the station serves Kettleman and Avenal City and traffic accidents on Interstate 5 (I-5) corridor through Kings County. Station 9 is staffed by three captains, three engineers, two heavy fire equipment operators, three firefighters (during fire season) and two fire personnel on duty at all times. Station 9 maintains two engines a water tender, a fire dozer and a dozer transport truck. Additionally, the County

Fire Department works closely with California Department of Forestry (CDF) and the Avenal State Prison Fire Department. The County and CDF have a "dual responsibility" area west of State Highway 33 (Kings County Fire Department, 2019) (City of Avenal, 2018a). See (Figure 3.4.1-1) for all the nearby fire and police stations in the vicinity of Avenal and the Project site.

The Kings County Fire Department indicated that all of the urbanized area of Avenal falls within a 3-minute response time. However, a portion of the City limits in the rural area is outside the 5-minute response time. The Project area is within one mile of Station 12 and about 8 to 12 minutes from the station:

The Kings County Fire Department Station 12 located within one mile of the Project would provide fire protection and emergency medical services. Station 9 is located approximately nine miles to the southeast of the Project site in Avenal.

An approved water supply system capable of supplying required fire flow for fire protection purposes is to be installed by the Project. The establishment of gallons-per-minute requirements for fire flow shall be based on the Guide for Determination of Required Fire Flow, published by the State Insurance Service Office and the Kings County's adopted Fire Code.

Fire hydrants would also be located and installed per the Kings County fire standards. The Project would install the required infrastructure to meet water supply demands for fire protection services. These design standards coupled with existing fire protection infrastructure would provide the proper fire suppression services on site. Development of the Project will increase the need for fire protection services and expand the service area and response times of the local Kings County Fire Department. By incorporating the fire standards and the required design features in the Project design additional fire protection services will be required to provide coverage for the Project. Because the Project will increase both the need and the demand for fire protection services in Avenal, the Project will comply with the Kings County Adopted Public Facilities Fees requirements.

The General Plan includes policies that would protect the Project and the community from fire dangers. These include the installation of fire safety devices in all homes and meeting required fire standards. Construction activities and the Project is not expected to increase the risk of fires on and adjacent to the Project site. The Project will comply with all applicable State and local building standards as required by local fire codes. In addition, to reduce the impacts to the fire protection services, Mitigation Measure MM HAZ-2 would require the Project to pay appropriate impact fees related to fire protection.

Therefore, with implementation of Mitigation Measure HAZ-2, the Project impacts will be less than significant.

Mitigation Measure(s)

Implementation of Mitigation Measure MM HAZ-2

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with incorporated mitigation*

Impact #3.4.15a(ii) – Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – Police Protection?

The Avenal Police Department (APD) provides law enforcement services to the City of Avenal. The APD located at 317 Alpine street in Avenal and is located approximately one and a half miles from the Project site. The APD would provide the primary public protection to the Project and the surrounding areas. The APD is comprised of sixteen sworn in police officers that cover the residential, commercial and industrial areas (City of Avenal, 2019) (City of Avenal, 2018a). In addition, the Project site is located in the California Highway Patrol's Central Division, that encompasses the heart of the San Joaquin Valley.

The Project will increase the local population by approximately, 550 residents and add four additional streets into the police patrol network. The Project may result in significant environmental impacts related to acceptable service ratios, response times, or to other performance objectives police protection services. In order to reduce impacts to public protection services, Mitigation Measure MM PUB-1 will require the Project to pay appropriate impact fees related to police protection. With implementation of MM PUB-1, the Project will pay support Kings County adopted Public Facilities Fees for each single-family house being constructed and impacts would be less than significant.

MITIGATION MEASURE(S)

MM PUB-1: Prior to the issuance of grading or building permits, the Project developer shall pay \$1,147.99 in Public Protection fees per each single-family home built as required by Kings County Adopted Public Facilities Fees.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with incorporated mitigation*

Impact #3.4.15a(iii) – Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – Schools?

The Project is within the Reef Sunset Unified School District (District), which includes eight school facilities that service both Avenal and Kettleman City. With the construction of the proposed 122-unit subdivision, it is anticipated that a portion of the homes would be inhabited by current Avenal residents. However, the Project could also attract new residents

moving into the City, which could generate a number of new students entering the District. Within a two-mile radius of the Project site there are five school facilities that potentially could be impacted by this Project, as seen on Figure 3.4.15-1. S

Based the most recent enrollment data from the California Department of Education, the school district has a total enrollment of 2,677 students (California Department of Education, 2019). Based on information received from District, it is at or near capacity (East, 2019). It is assumed that the Project would impact the District. It is noted that District will be able to accommodate the potential additional students by the using additional portable classrooms. There are no new schools being planned or developed in the District and the impact of the Project is not anticipated to require the District to construct new school buildings, additional roads or facilities will need to be built for the Project. However, depending on the number of new students that would enroll from the Project, the District may hire new faculty and /or staff.

The Project will impact the local school district. In order to maintain acceptable student/teach ratios or other performance objectives schools, the Project must comply with Ordinance No. 86-001 and mitigation measure MM PUB- 2, which requires payment of developer impact fees. Therefore, with compliance of mitigation measure MM PUB-2, the proposed Project would have a less than significant impact on school services.

MITIGATION MEASURE(S)

MM PUB-2: Prior to the issuance of grading or building permits, the Project developer shall comply with both the City of Avenal School Developer Fees requirement and Ordinance No. 86-01. No fees shall be imposed on development covered by this ordinance where at the time of the issuance of a building permit, the building official of the City of Avenal shall have on file a letter from the superintendent of the Reef Sunset Unified School District stating that an agreement or arrangement between the developer and the School District has been reached offsetting any impacts from the Project.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.15a(iv) – Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – Parks?

As seen on Figure 3.4.15-1 there are several regional parks within driving distance of Avenal, and there are two City parks within the City limits. There are three main parks and recreational facilities visited by residents of Avenal: 1) Hickey Park located at Flint and Seventeenth Avenues near Hanford approximately 33-miles to the northwest of the Project; 2) Burris Park and historical museum located approximately 45-miles northeast of the

Project and 3) Kingston Park, located adjacent to the Kings River, approximately 40-miles to the northeast of the Project (Kings County , 2009).

The City of Avenal also has two nearby community parks that are each within one mile of the proposed Project, the Floyd Rice Park and the Avenal Neighborhood Park. There is also a 20-acre Sports Complex about 1.5 miles from the Project site. Fresno County Parks Department also has regional parks facilities in the area. In addition, the City of Coalinga's parks facilities located 17-miles northwest of the Project (City of Avenal, 2018a).

The future residents of the Project are likely to utilize the nearby regional and community parks. Development of the Project is not expected to cause or result in a demand for a new parks or other additional services to the community. The Project is not expected to result in any adverse impacts on the existing parks or recreation areas. However, the City of Avenal requires that the Project developer pay park impact fees for parkland, community centers and recreational facilities, park amenities, vehicles equipment, and impact fee studies to offset any potential impacts from new development. Therefore, with incorporated mitigation measure, MM PUB-3, the proposed Project would have a less than significant impact on parks and recreational facilities.

MITIGATION MEASURE(S)

MM PUB-3: Prior to the issuance of grading or building permits, the Project developer shall pay City of Avenal Park Impact Fees. The developer shall pay a flat fee of \$1,501.47 for parks, parks facilities, amenities and equipment for parks in Avenal.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.15a(v) – Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – Other Public Facilities?

The Project is within the Avenal General Plan and has been analyzed and planned as a residential development. However, the new residents will come to live in the Project are expected to utilize public facilities such as: libraries and other public services and facilities within Kings County and Avenal.

The General Plan has the existing goal (GOAL LU-10) to providing adequate public facilities to serve the expected growth in the City (City of Avenal, 2018a). The Project is proposed on land that is currently designated for commercial and residential development; it is expected that a portion of the homes would be inhabited by existing Avenal residents, and a portion of residents would be new to the City. As discussed in Impact #3.4.14a, the growth expected

from this planned residential development Project meets the expected growth patterns for 2020-2025. These figures and tables along with the comprehensive plan show that the City of Avenal fully expects additional growth and is prepared to construct additional public facilities as they are needed.

The proposed Project would affect the demand for public services through the increase of the local population. This growth is in accordance with the General Plan. In order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services facilities, the Project must comply with the City of Avenal General Government impact fee requirements for each single-family residences being constructed. Therefore, with incorporated mitigation measure, MM PUB-4, the proposed Project would have a less than significant impact on other public services facilities.

MITIGATION MEASURE(S)

MM PUB-4: Prior to the issuance of grading or building permits, the Project developer must pay City of Avenal General Government Impact Fees. The developer shall pay \$752.67 per each housing unit built. Evidence of payment shall be submitted to the Avenal Community Development Department.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated.*



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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3.4.16 - RECREATION

Would the Project:

- | | | | | |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Discussion

Impact #3.4.16a – Would the Project Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

As discussed in Impact #3.4.14a, #3.4.15a(iv) and 15a(v), the Project would increase the use of existing neighborhood and nearby recreational facilities, including regional parks and other public facilities by increasing their use and overall rate of physical deterioration. However, even with the additional residents to the City of Avenal, the Project is not expected to cause a substantial physical deterioration.

As discussed in Impact #3.4.15a(v), the General Plan has the existing goal (GOAL LU-10) to provide adequate public facilities to serve the expected growth in the City of Avenal (City of Avenal, 2018a). Mitigation measure PUB-3 requires that the Project developer pay fees to offset the cost for the upkeep and maintenance of parks and recreational facility. Therefore, with implementation of Mitigation Measure, MM PUB-3, the proposed Project would have a less than significant impact on parks and recreational facilities.

MITIGATION MEASURE(S)

Implementation of MM PUB-3.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with incorporated mitigation*

Impact #3.4.16b – Would the Project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

As discussed in Impacts #3.4.14a, #3.4.15a(iv), (v) and #3.4.16a the Project will have an impact on the local recreational facilities. The Project will be required to pay developer fees to contribute to existing parks, and/or construct either green/open space or additional recreational facilities as part of the approval of the tentative tract map process. Therefore, with implementation of MM PUB-3, the Project will have a less than significant impact

MITIGATION MEASURE(S)

Implementation of MM PUB-3.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with incorporated mitigation*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.17 - TRANSPORTATION

Would the Project:

a.	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

The analysis below is based on a Traffic Impact Study (TIS) prepared for this Project (Ruetters & Schuler, 2019), which is found in Appendix E of this document. The TIS was prepared using trip generation and design hour volumes calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition as well as data provided in the Project description.

Impact #3.4.17a – Would the Project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The construction of the proposed Project is intended to house current and future residents of Avenal. The roadways provide circulation in the vicinity include the following:

Corcoran Avenue is a north-south collector that extends from Kern Street to Hydril Road and provides access to residential land uses. In the vicinity of the Project it exists as a two-lane roadway with curb and gutter.

Fresno Street is an east-west minor collector that extends from Corcoran Avenue to Skyline Boulevard (SR 269) and provides access to residential and commercial land uses. In the vicinity of the Project it exists as a two-lane roadway with curb and gutter.

Kern Street is an east-west two-lane collector that extends from 7th Avenue to Union Avenue. An extension of Kern Street west of Corcoran Avenue is anticipated to be constructed concurrently with the Project.

Skyline Boulevard (SR 269) is generally north-south arterial that provides access to commercial and residential areas in the city of Avenal. In the vicinity of the Project it exists as a two-lane roadway with curb and gutter.

Union Avenue is a north-south minor collector that extends from Salem Avenue to Skyline Boulevard (SR 269) and provides access to residential and school land uses. In the vicinity of the Project it exists as a two-lane roadway with curb and gutter.

7th Avenue is a north-south collector that extends from State Route 33 and dead ends into Mariposa Street adjacent to Avenal High School. In the vicinity of the Project it exists as a two-lane roadway with curb and gutter.

Existing and Future Traffic

Existing peak hour turn movement volumes were field measured in November 2019 at the study intersections.

Annual growth rates of 0.5% to 1.97% were applied to existing traffic volumes to estimate future traffic volumes for the year 2040. These growth rates were estimated based on a review of KCAG traffic model data. Table 3.4.17-1 shows the Project's trip generation assumptions used for the traffic modeling.

**Table 3.4.17-1
Project Trip Generation**

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE CODE	Dev Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	122 Dwelling Units	eq	1249	eq	25% 23	75% 69	eq	63% 77	37% 45

Source: (Ruetters & Schuler, 2019)

Levels of Service

Criteria for intersection level of service (LOS) are shown in the Tables 3.4.16-2 and 3.4.16-3 below.

**Table 3.4.17-2
Level of Service Criteria – Unsignalized Intersections**

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

Source: (Ruetters & Schuler, 2019)

Table 3.4.17-3
Level of Service Criteria Signalized Intersections

Volume/Capacity	Control Delay (sec/veh)	Level of Service
<0.60	≤10	A
0.61-0.70	>10 and ≤20	B
0.71-0.80	>20 and ≤35	C
0.81-0.90	>35 and ≤55	D
0.91-1.0	>55 and ≤80	E
>1.0	>80	F

Source: (Ruetters & Schuler, 2019)

Level of service for the study intersections is presented in Tables 3.4.16-4 through 3.4.16-7. According to the General Plan circulation element, the peak hour level of service should be no lower than “D” for collector and Arterial streets (City of Avenal, 2018a). Local streets should be “C” unless improvements necessary to make “C” level streets unsafe (Ruetters & Schuler, 2019).

Table 3.4.17-4
AM Intersection Level of Service

#	Intersection	Control Type	2019	2019+ Project	2040 ¹	2040 ¹ + Project
1	7 th Avenue & Skyline Boulevard (SR 269)	Signal	C	C	C	C
2	7 th Avenue & Fresno Street	EB WB	B B	B B	B B	B B
3	Union Avenue & Fresno Street	EB WB	A A	B B	B A	B B
4	Corcoran Avenue & Fresno Street	ASWC	A	A	A	A

#	Intersection	Control Type	2019	2019+ Project	2040 ¹	2040 ¹ + Project
5	Corcoran Avenue & Kern Street	WB	A	A	A	A

Source: (Ruettgers & Schuler, 2019)

Table 3.4.17-5
PM Intersection Level of Service

#	Intersection	Control Type	2019	2019+ Project	2040 ¹	2040 ¹ + Project
1	7 th Avenue & Skyline Boulevard (SR 269)	Signal	C	C	C	C
2	7 th Avenue & Fresno Street	EB WB	B B	B B	B C	B C
3	Union Avenue & Fresno Street	EB WB	B A	B B	B A	B B
4	Corcoran Avenue & Fresno Street	ASWC	A	A	A	A
5	Corcoran Avenue & Kern Street	WB	A	A	A	A

Source: (Ruettgers & Schuler, 2019)

Traffic Signal Warrant Analysis

Peak hour signal warrants were evaluated for each of the unsignalized intersections within the study based on the California Manual on Uniform Traffic Control Devices (MUTCD). Peak hour signal warrants assess delay to traffic on the minor street approaches when entering or crossing a major street. Signal warrant analysis results for existing and future AM and PM peak hours are shown in Tables 3.4.17-6 (a-b) and 3.4.17-7 (a-b).

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable

level of service or operate below an acceptable level of service and not meet signal warrant criteria.

Table 3.4.17-6a
AM Traffic Signal Warrant Analysis

#	Intersection	2019			2019+Project			2040			2040+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	7th Ave at Fresno St	306	59	NO	318	96	NO	406	66	NO	418	103	NO
3	Union Ave at Fresno St	135	25	NO	141	77	NO	222	28	NO	228	79	NO
4	Corcoran Ave at Fresno St	83	15	NO	153	33	NO	95	17	NO	165	35	NO
5	Corcoran Ave at Kern St	7	6	NO	75	31	NO	9	7	NO	77	32	NO

Source: (Ruetters & Schuler, 2019)

Table 3.4.17-6b
PM Traffic Signal Warrant Analysis

#	Intersection	2019			2019+Project			2040			2040+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	7th Ave at Fresno St	396	116	NO	436	140	NO	524	129	NO	564	153	NO
3	Union Ave at Fresno St	178	30	NO	199	71	NO	291	33	NO	312	74	NO
4	Corcoran Ave at Fresno St	138	22	NO	192	84	NO	156	24	NO	210	86	NO
5	Corcoran Ave at Kern St	5	5	NO	111	21	NO	6	6	NO	112	22	NO

Source: (Ruetters & Schuler, 2019)

Roadway Analysis

A capacity analysis of the study roadways was conducted using Highway Capacity Software (HCS) software from McTrans. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2019)
- Existing + Project (2019)
- Future Cumulative (2040)
- Future Cumulative + Project (2040)

**Table 3.4.17-8
Roadway Level of Service**

Street	2019		2019 + Project		2040		2040 + Project	
	Directional LOS		Directional LOS		Directional LOS		Directional LOS	
	<i>N or E</i> <i>AM/PM</i>	<i>S or W</i> <i>AM/PM</i>	<i>N or E</i> <i>AM/PM</i>	<i>S or W</i> <i>AM/PM</i>	<i>N or E</i> <i>AM/PM</i>	<i>S or W</i> <i>AM/PM</i>	<i>N or E</i> <i>AM/PM</i>	<i>S or W</i> <i>AM/PM</i>
<i>Fresno St: 7th Ave to Union Ave</i>	A/A	A/B	A/B	A/B	A/B	A/B	A/B	A/B
<i>Fresno St: Union Ave to Corcoran Ave</i>	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
<i>7th Ave: Skyline Blvd (SR 269) to Fresno St</i>	B/B	B/B	B/B	B/B	B/B	B/B	B/B	B/B
<i>Corcoran Ave: Fresno St to Kern St</i>	A/A	A/A	A/B	A/B	A/A	A/A	A/B	B/B

Source: (Ruettgers & Schuler, 2019)

Intersection Analysis

All intersections operate at an acceptable level of service during peak hours in the existing and future years. All intersections will operate at an acceptable level with the addition of Project traffic in the existing and future year scenarios.

Roadway Analysis

All roadways within the Project scope operate at acceptable levels of service in the existing and future years. All roadways will operate at an acceptable level with the addition of Project traffic in the existing and future year scenarios.

Vehicle Miles Traveled (VMT) Evaluation Intersection

An evaluation of vehicle miles traveled (VMT) for Project traffic was conducted based on applicable California Environmental Quality Act (CEQA) guidelines. The analysis involved

comparing an estimate of VMT attributable to the Project to a baseline VMT for the Avenal area and assessing whether Project VMT would result in a significant transportation impact.

Several factors were taken into consideration when estimating Project VMT, including proposed land use and Project trip type and distribution. Given the Project's close proximity to the SR 269 and I-5, it is estimated that 30 percent of traffic generated by the Project would be out-of-town (regional) trips. These trips would utilize SR 269 and/or I-5 to travel to neighboring cities. In-town (local) trips would comprise the remaining 70 percent of Project traffic. Based on the Table 3.4.17-9, it is anticipated that the Project will result in a weighted average VMT of 4.36 miles per vehicle per day. An average daily VMT of 5.95 miles was obtained from the Kings County Association of Governments (KCAG) for use in this study. This baseline average VMT was developed based on household and employment populations in the Avenal area as well as local and regional travel patterns.

Table 3.4.17-9
VMT Analysis

Trip Type	Project ADT	Trip Length	Miles Traveled	Average VMT
Regional	375	26.65	9986	8.00
Local	874	1.03	903	0.72
Average				4.36

Source: (Ruetters & Schuler, 2019)

The average Project VMT of 4.36 miles per vehicle per day is less than the baseline average VMT of 5.95 miles.

Vehicle Miles Traveled Evaluation

The average Project VMT is less/more than the baseline average for the Avenal area. Therefore, the Project is not expected to result in a significant transportation impact.

CONCLUSION

Based on the City of Avenal's thresholds for determining whether Project traffic will have a significant impact on the surrounding intersections and roadways, it is anticipated that the Project will have a less- than-significant impact on the transportation network within the vicinity of the Project site.

Based on the information presented in the TIS, the proposed Project will have a less than significant impact on or conflict with a program, plan, ordinance or policy addressing the

circulation system, including transit, roadway, bicycle and pedestrian facilities. Therefore, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.17b – Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

See Impact #3.4.17a, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.17c – Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The Project will be designed to current standards and safety regulations. All intersections will be constructed as to comply with the MUTCD regulations and design and safety standards of Chapter 33 of the California Building Codes (CBC) and the guidelines of Title 24 in order to create safe and accessible roadways.

Vehicles exiting the subdivision will be provided with a clear view of the roadway without obstructions. Landscaping associated with the entry driveways could, impede such views, if improperly installed. Specific circulation patterns and roadway designs will incorporate all applicable safety measures to ensure that hazardous design features or inadequate emergency access to the site or other areas surrounding the Project area would not occur.

Therefore, with the incorporated design features and all applicable rules and regulations the Project will have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.17d – Would the Project result in inadequate emergency access?

See Impact# 3.4.17c above.

The proposed Project would be required to comply with all emergency access requirements adopted and set forth in the City of Avenal Municipal Code. These requirements and all others required to be included in the Project design will be verified by the City prior to Project approval. Therefore, emergency access impacts will be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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3.4.18 - TRIBAL CULTURAL RESOURCES

Would the Project:

- a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

☐ ☒ ☐ ☐

Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or

☐ ☒ ☐ ☐

A resource determined by the Lead Agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the Lead Agency shall consider the significance of the resource to a California Native American tribe.

☐ ☒ ☐ ☐

Discussion

Impact #3.4.18a(i) – Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is – listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

See the discussion presented in Section 3.4.5 - *Cultural Resources*, Impacts #3.4.5a through 3.4.5c. Documentation can be found in Appendix C of this document.

On October 22, 2019, a request was made to the NAHC for a SLF search. The result of the search was negative. On December 4, 2019 letters were mailed to each of the six Native American tribes within the geographic area. The letters included a brief Project description

and location maps. To date, no response has been received from any of the Indian tribes contacted.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM CUL-1 and MM CUL-2.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.18a(ii) – Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is – a resource determined by the Lead Agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the Lead Agency shall consider the significance of the resource to a California Native American tribe?

See discussion for Impacts #3.4.5a through #3.4.5c and Impact #3.4.18a(i), above.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM CUL-1 and MM CUL-2.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.19 - UTILITIES AND SERVICE SYSTEMS

Would the Project:

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

This analysis relied upon review of applicable requirements of the California Region Water Quality Control Board (CRWQCB) and by the Avenal General Plan.

Impact #3.4.19a – Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The Project would be constructed on land that has already been designated for residential development in the General Plan. The City has indicated that the infrastructure necessary to

serve the Project is available and sufficient. The Project site will connect to the City of Avenal's existing water and sewer systems. The Project is located within the planned future growth and service area for the Avenal Wastewater Treatment plant. The existing treatment plant has reserved one-half of the treatment plant's capacity for future development in Avenal and will be adequate for the proposed Project (City of Avenal, 2018a). Therefore, no additional sewer capacity would be required for the proposed Project. Impacts are considered less than significant.

The Pacific Gas and Electric Company (PG&E) provides electricity to the City. The existing trunk and transmission facilities are adequate to meet present and Projected demand in the community (City of Avenal, 2018a). The Project will connect to the existing PG&E transmission lines for electrical power. Telecommunication requirements for the Project are typical of this type of land use and would not require any expansion or construction of new telecommunication facilities.

The proposed Project would not require or result in the construction or expansion of existing or new water, wastewater treatment, electrical or telecommunications facilities. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.19b – Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?

The Avenal's drinking water is provided by the San Luis Canal, which is part of the State and federal water project that provides water to the west side of the San Joaquin Valley. The City obtains the canal water through a contract with the U.S. Bureau of Reclamation (USBR) (City of Avenal, 2018a). The USBR contract allocates a maximum delivery of 3,500 acre-feet per year to the City. However, the actual delivery to the City is subject to the availability of water to the San Luis Project. As a result of dry water years, USBR may reduce the City's allocation to a percentage of historical use. The amount of reduction will depend on precipitation levels, snowpack and State reservoir levels.

The Project will connect to the existing sewer system and water supply network. Water will be supplied by the San Luis water Canal by an agreement with the City of Avenal from the U.S. Bureau of Reclamation (USBR). As discussed in Impact#3.4.10b the Project is expected to use 32.8 AF of water annually. As discussed in Impact #3.4.19a, above, there is adequate water supply and sewer services for the Project. The Project would connect to an existing water line located approximately 50 feet north of the Project site.

MITIGATION MEASURE(S)

Implementation of MM HYD-1.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.19c – Would the Project result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?

See #3.4.19a and b.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant impact*.

Impact #3.4.19d – Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Implementation of the proposed Project would result in the generation of solid waste on the Project site, which would increase the demand for solid waste disposal. During construction these materials, which are not anticipated to contain hazardous materials, would be collected and transported away from the site. The City of Avenal has its own 173-acre, Class III landfill site, Avenal Regional Landfill (ARL), located approximately 1-mile north of the proposed Project site. The landfill property is owned by the City of Avenal. Waste includes residential refuse, commercial solid wastes, tires, and construction/demolition wastes. The City contracts with Mid Valley Disposal for solid waste collection.

Once constructed, the Project would generate solid waste typical of residential development. Solid waste removed from the site would be transported to the ARL for disposal by a license waste hauler. A generation of solid waste resulting in a significant impact is not anticipated, as the ARL has a remaining capacity of 30,300,000 cubic yards (CalRecycle, 2019).

The Project, in compliance with federal, State, and local statutes and regulations related to solid waste, would dispose of all waste generated on-site at an approved solid waste facility. The Project does not, and would not conflict with federal, State, or local regulations related to solid waste. The proposed Project would be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs in compliance with federal, State, and local statutes and regulations related to solid waste. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant impact*

Impact #3.4.19e – Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

See discussion for Impact #3.4.19d.

The 1989 California Integrated Waste Management Act (AB 939) requires Kings County to attain specific waste diversion goals. In addition, the California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development Projects to incorporate storage areas for recycling bins into the proposed Project design. Reuse and recycling of construction debris would reduce operating expenses and save valuable landfill space.

As stated above, the Avenal Regional Landfill has available capacity to accommodate solid waste generated by the proposed Project. Therefore, the proposed Project would not be expected to significantly impact Kings County landfills. The proposed Project would be required to comply with all federal, State, and local statutes and regulations related to solid waste. Therefore, implementation of the proposed Project would result in a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.20 - WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentration from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

Impact #3.4.20a – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project substantially impair an adopted emergency response plan or emergency evacuation plan?

See also Impact #3.4.9f regarding emergency response.

According to data from the Cal Fire, the lands to the northeast of the Project site of being a high and moderate fire hazard zone, which does not include the Project site (City of Avenal, 2018a).

As noted previously, Kings County Emergency Operations Plan (EOP) establishes emergency procedures and policies and identifies responsible parties for emergency response in the County (Kings County, 2015). The EOP includes policies that would prevent new

development from interfering with emergency response of evacuation plans. The Project will comply with all local regulations related to the construction of new development that is consistent with the EOP. The Project will adhere to the standards set forth in City of Avenal the Uniform Fire Code (Ordinance No. 87-04) (City of Avenal, 1988). The Project would also comply with the appropriate local and State requirements regarding emergency response plans and access. The proposed Project would not inhibit the ability of local roadways to continue to accommodate emergency response and evacuation activities.

The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, the Project would have a less than significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.20b – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentration from a wildfire or the uncontrolled spread of a wildfire?

As noted previously, fire hydrants would also be located and installed per the Kings County fire standards. The Project would install the required infrastructure to meet water supply demands for fire protection services. Development of the Project will increase the need for fire protection services, expand the service area of the local Kings County Fire Department. However, the Project will comply with the Kings County Adopted Public Facilities Fees requirements related to fire protection. To reduce the impacts to the fire protection services, Mitigation Measure MM HAZ-2 would require the Project to pay appropriate impact fees related to fire protection. Therefore, with implementation of Mitigation Measure HAZ-2, the Project impacts will be less than significant.

The Project will be built up in an existing urban area. The proposed Project site is flat and may be affected by prevailing winds that moves in a predominately, southeasterly direction with an average speed of 4-6 knots with maximum gusts of 40-50 knots. Avenal has prevailing wind that comes from the north and northwest except in December and January, when the winds blow from the southeast of east-southeast (City of Avenal, 2018a). Such winds may impact the City and the Project. By implementing both State Fire Marshall and the local fire code requirements, the Project would not exacerbate the risk of exposure of Project occupants to wildfire. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

Implementation of MM HAZ-2.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

Impact #3.4.20c – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

See Impacts # 3.4.9a and g, #3.4.20a and b above.

The Project is not located within 350 feet of high voltage transmission lines. Based on available data, the nearest high voltage electric transmission lines is outside the eastern City limits of Avenal (California Energy Commission, 2019). The Project would require the installation or maintenance of additional distribution lines to connect the residences to the existing utility grid. However, the Project would be constructed in accordance with all local and State regulations regarding power lines and other related infrastructure, as well as fire suppression requirements. Therefore, the Project would not exacerbate fire risk or result in temporary or ongoing impacts to the environment and impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant*.

Impact #3.4.20d – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

See Impacts # 3.4.9a and g, #3.4.20a, b and c, above.

The site is topographically flat land. There are no slopes on or near the property and the Project would not expose the people or structures to significant risks from downslope or downstream flooding or landslides due to a result of runoff, post fire instability or drainage changes.

According to FEMA Flood Insurance Rate Maps the Project is within an area of minimal flood hazards (FEMA, 2019). In addition, MM GEO-1 requires the preparation of a SWPPP to mitigate the site drainage changes during the construction of the proposed Project. Therefore, no flooding is anticipated as a result of runoff, post-fire slope instability, or drainage changes. With incorporation of MM GEO-1, the Project will have a less than significant impact.

MITIGATION MEASURE(S)

Implementation of **MM GEO-1**.

LEVEL OF SIGNIFICANCE

Impacts would be *less than significant with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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3.4.21 - MANDATORY FINDINGS OF SIGNIFICANCE

- | | | | | | |
|----|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| a. | Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. | Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are significant when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. | Does the Project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Discussion

Impact #3.4.21a – Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

As evaluated in this IS/MND, the proposed Project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory. With implementation of the mitigation measures recommended in this

document, the proposed Project would not have the potential to degrade the quality of the environment, significantly impact biological resources, or eliminate important examples of the major periods of California history or prehistory. Therefore, with the following mitigation measures the Project would have a less than significant impact.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM BIO-1 through MM BIO-6 and MM CUL-1 and MM CUL-2.

LEVEL OF SIGNIFICANCE

The Project would have a *less than significant impact with mitigation incorporated*.

Impact #3.4.21b - Does the Project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a Project are significant when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.)?

As described in the impact analyses in Sections 3.4.1 through 3.4.20 of this IS/MND, any potentially significant impacts of the proposed Project would be reduced to a less than significant level following incorporation of the mitigation measures listed in Section 6, *Mitigation Monitoring and Reporting Plan*. The proposed Project would not otherwise combine with impacts of related development to add considerably to any cumulative impacts in the region. With mitigation, the proposed Project would not have impacts that are individually limited, but cumulatively considerable. Therefore, the Project would have a less than cumulatively considerable impact with mitigation incorporated.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM BIO-1 through MM BIO-6, MM CUL-1 through MM CUL-2, MM GEO-1 through MM GEO-6, MM HYD-1, MM HAZ-1, MM TRA-1, MM NSE-1, and MM PUB-1 through MM PUB-5.

LEVEL OF SIGNIFICANCE

The Project would have a *less than significant impact with mitigation incorporated*.

Impact #3.4.21c - Does the Project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?

All of the Project’s impacts, both direct and indirect, that are attributable to the Project were identified and mitigated. The Project mitigation measures will substantially reduce or eliminate impacts of the Project. Therefore, the proposed Project would not either directly or indirectly cause substantial adverse effects on human beings because all potentially adverse direct impacts of the proposed Project are identified as having no impact, less than significant impact, or less than significant impact with mitigation.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM BIO-1 through MM BIO-6, MM CUL-1 through MM CUL-2, MM GEO-1 through MM GEO-6, MM HYD-1, MM HAZ-1, MM TRA-1, MM NSE-1, and MM PUB-1 through MM PUB-5.

LEVEL OF SIGNIFICANCE

The Project would have a *less than significant impact with mitigation incorporated.*

SECTION 4 - LIST OF PREPARERS

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**SECTION 6 - MITIGATION MONITORING AND
REPORTING PROGRAM**

RESERVED

APPENDIX A
SMALL PROJECT LEVEL ASSESSMENT



SMALL PROJECT ANALYSIS LEVEL ASSESSMENT

QK, Inc.

Single-Family Residential Project
APN 038-260-055
Avenal, CA

Prepared By:

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INSIGHT ENVIRONMENTAL / TRINITY CONSULTANTS
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November 2019

Project 190505.0257



Environmental solutions delivered uncommonly well

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1. EXECUTIVE SUMMARY

1.1. EXECUTIVE SUMMARY

Insight Environmental Consultants, Inc., a *Trinity Consultants Company*, has completed a limited air quality assessment for a 122 unit single-family residential project to be located on 18.65 acres of APN 038-260-055, near the intersection of East Kern Street and South Corcoran Avenue in Avenal, California (Project).

This limited air quality assessment uses the San Joaquin Valley Air Pollution Control District's (SJVAPCD) screening tool, Small Project Analysis Level (SPAL) (SJVAPCD, 2017). This SPAL assessment was prepared pursuant to the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD, 2015), the California Environmental Quality Act (CEQA) (Public Resources Code 21000 – 21189), and the CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

1.2. STATEMENT OF FINDING

Based on the SPAL established by the SJVAPCD's GAMAQI, the emissions estimates prepared pursuant to this SPAL assessment do not exceed the SJVAPCD's established emissions thresholds and significance thresholds for all CEQA air quality determinations; this Project would therefore *not pose a significant impact* to the San Joaquin Valley Air Basin and would have a *less than significant air quality impact*.

2. PROJECT INFORMATION

2.1. PROJECT DESCRIPTION

The Project includes the construction of 122 single-family dwelling units. The Project was assessed as if it would be developed in one phase. This assessment examines the projected gross impacts to air quality posed by this Project to the San Joaquin Valley Air Basin to determine whether or not the Project remains below established air quality thresholds of significance.

2.2. PROJECT LOCATION

The Project site is located on 18.65 acres in the City of Avenal, California, on the southeast corner of Kern Street and South Corcoran Avenue on APN 038-260-055. **Figure 2-1** depicts the Project location within the City of Avenal.

Figure 2-1. Location in Avenal, CA



3. SMALL PROJECT ANALYSIS LEVEL QUALIFICATION

This assessment was prepared pursuant to the SJVAPCD's GAMAQI (SJVAPCD, 2015), the CEQA (Public Resources Code 21000 to 21189), and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387). The SJVAPCD created the SPAL screening tool to streamline air quality assessments of commonly encountered projects. According to the GAMAQI, the SJVAPCD “pre-calculated the emissions on a large number and types of projects to identify the level at which they have no possibility of exceeding the emissions thresholds”¹.

The SJVAPCD SPAL process established review parameters to determine whether a project qualifies as a “small project.” A project that is found to be “less than” the established parameters has “no possibility of exceeding criteria pollutant emissions thresholds.” **Table 3-1** presents the SPAL size parameters for residential projects.

Table 3-1. Small Project Analysis Level in Units for Residential

Land Use Category - Housing	Project Size (Units)*
Single Family	390
Apartments, Low Rise	590
Apartments, High Rise	600
Condominiums, General	590
Condominiums, High Rise	590
Mobile Homes	760
Retirement Community	880
Proposed Project – Single Family	122
SPAL Exceeded?	No
Notes: * Project size based on SPAL Table 5-3(a), as posted on SJVAPCD webpage: http://www.valleyair.org/transportation/CEQA Rules/GAMAQI-SPAL.pdf	

As shown in **Table 3-1**, the proposed Project would not exceed the established SPAL limits for a “Single Family” residential project. The Project would construct 122 single family residential units compared to the allowable project size for a Single Family residential project, which is 390 units. Based on the above information, this Project qualifies for a limited air quality analysis applying the SPAL guidance to determine air quality impacts.

¹ SJVAPCD GAMAQI, Section 8.3.4, Page 85.

4. AIR QUALITY IMPACTS AND EVALUATION

Significance thresholds are based on the CEQA Appendix G Environmental Checklist Form (not included herein) and SJVAPCD air quality thresholds (SJVAPCD, 2015). A potentially significant impact to air quality, as defined by the CEQA Checklist, would occur if the project caused one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The SJVAPCD has identified quantitative emission thresholds to determine whether the potential air quality impacts of a project require analysis in the form of an Environmental Impact Report. The SJVAPCD air quality thresholds from the GAMAQI are presented in **Table 4-1** (SJVAPCD, 2015). The SJVAPCD separates construction emissions from operational emissions, and further separates permitted operational emissions from non-permitted operational emissions, for determining significance thresholds for air pollutant emissions.

Table 4-1. SJVAPCD Air Quality Thresholds of Significance - Criteria Pollutants

Pollutant/Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NO _x	10	10	10
ROG	10	10	10
SO _x	27	27	27
PM ₁₀	15	15	15
PM _{2.5}	15	15	15

Source: SJVAPCD, 2015

Criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 (California Air Pollution Control Officers Association (CAPCOA), 2016). This Project would generate short-term construction emissions and long-term operational emissions.

An air quality evaluation also considers: 1) exposure of sensitive receptors to substantial pollutant concentrations and 2) the creation of other emissions (such as those leading to odors) adversely affecting a substantial number of people. The criteria for this evaluation are based on the Lead Agency's determination of the proximity of the proposed Project to sensitive receptors. A sensitive receptor is a location where human populations, especially children, senior citizens, and sick persons, are present, and where there is a reasonable expectation of continuous human exposure to pollutants according to the averaging period for ambient air quality standards, i.e. the 24-hour, 8-hour, or 1-hour standards. Commercial and industrial sources are not considered sensitive receptors.

5. PROJECT-RELATED EMISSIONS

This document was prepared pursuant to the SJVAPCD's GAMAQI and SPAL guidelines and provides a cursory review of the Project emissions to demonstrate that it would not exceed established air quality emissions thresholds.

5.1. SHORT-TERM EMISSIONS

Table 5-1 shows the construction emission levels using default CalEEMod factors for construction of a 122 unit single-family residential project (see **Attachment A**). The following changes to the model default values were incorporated during the CalEEMod analysis:

- Project site acreage was changed from the default (39.61 acres) to the actual acreage of the Project site (18.65 acres).

Construction emission estimates also included the following SJVAPCD Regulation VIII required measures for all projects:

- Water exposed area 3 times per day; and
- Reduce vehicle speed to less than 15 miles per hour.

Based on these anticipated activity levels, the Project construction activities would not exceed construction thresholds (**Table 4-1**). Therefore, construction emissions were found to be *less than significant* and no further evaluation is required.

Table 5-1. Construction Emission Levels

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
	(tons/year)					
Unmitigated						
2020 Construction Emissions	0.36	3.29	2.74	0.005	0.46	0.28
2021 Construction Emissions	2.16	0.89	0.91	0.002	0.07	0.05
Mitigated						
2020 Construction Emissions	0.36	3.29	2.74	0.005	0.33	0.22
2021 Construction Emissions	2.16	0.89	0.91	0.002	0.07	0.05
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15
Is Threshold Exceeded?	No	No	No	No	No	No

5.2. LONG-TERM EMISSIONS

Table 5-2 presents the Project's long-term operational emissions generated from mobile, energy, and area sources as well as from water use and waste generation emissions. Most of the operational emissions are from mobile sources traveling to and from the Project area. The following changes to the model default values were incorporated during the CalEEMod analysis:

- Operational Vehicle Fleet Mix was changed from the default to match the SJVAPCD's residential fleet mix for operational year 2021; and

- Fireplace and Woodstove devices were changed from the default values to reflect the new restrictions under SJVAPCD's Rule 4901: Wood Burning Fireplaces and Wood Burning Heaters (amendment effective January 1, 2020).

Operational emissions estimates also included the following mitigation measures, even though the Project was less than significant before mitigation:

- Improved pedestrian network;
- All natural gas hearths; and
- Use electric lawnmower, leaf blower, and chainsaw (3% per SJVAPCD).

Table 5-2. Total Project Operational Emissions

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
	(tons/year)					
Unmitigated						
Operational Emissions	1.56	1.99	7.09	0.02	1.65	0.47
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded Before Mitigation?	No	No	No	No	No	No
Mitigated						
Operational Emissions	1.56	1.96	6.98	0.02	1.62	0.46
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded After Mitigation?	No	No	No	No	No	No

As calculated (see **Attachment A**), the long-term operational emissions associated with the proposed Project would be less than SJVAPCD significance threshold levels and would, therefore, *not pose a significant impact to criteria air pollutants*. This finding is consistent with the SPAL screening thresholds.

5.3. GREENHOUSE GAS EMISSIONS

The Project's greenhouse gas (GHG) emissions are primarily from mobile source activities. Not all GHGs exhibit the same ability to induce climate change; as a result, GHG contributions are commonly quantified as carbon dioxide equivalents (CO₂e) (see **Attachment A**). The proposed Project's operational CO₂e emissions were estimated using CalEEMod. These emissions are summarized in **Table 5-3**.

Table 5-3. Estimated Annual Greenhouse Gas Emissions

	CO ₂ Emissions metric tons	CH ₄ Emissions metric tons	N ₂ O Emissions metric tons	CO ₂ e Emissions metric tons
2021 Project Operations	2,152.0	1.87	0.014	2,203.0
2005 BAU	3,748.5	2.79	0.013	3,822.2
BAU less Project emissions				42.4%

The current inventory and forecast for GHG emissions in the California Air Resources Board's 2008 Climate Change Scoping Plan supports the 2011 IPPC estimates. The 2008 Climate Change Scoping Plan also indicates that GHG emissions will increase to 596 million metric tons of CO₂e by 2020 (i.e. business-as-usual). It is widely

understood that climate change is a “global” issue and, as such, GHG emissions are a cumulative problem and can only be evaluated as such.

The amount of CO₂e that would be generated by the Project (2,203.0 metric tons-per-year) is so small in relation to the California CO₂e estimates for 2020 (596 million CO₂e) that it's not possible for the contribution of the Project to be cumulatively considerable. Additionally, the Project's GHG emissions are less than the 2005 business-as-usual emissions for the Project by 1,619.2 metric tons-per-year of CO₂e, which is a 42.4% reduction. Therefore, the Project would not generate a cumulatively considerable GHG impact nor would it conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The Project will also not conflict with any elements of the California Air Resources Board's 2008 Climate Change Scoping Plan. Therefore, this potential impact is *less than significant*.

5.4. POTENTIAL IMPACT ON SENSITIVE RECEPTORS

The proposed Project is located on the southeast corner of Kern Street and South Corcoran Avenue. Sensitive receptors are defined as areas where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside. Schools, hospitals, nursing homes, and daycare centers are locations where sensitive receptors would likely reside. The closest schools are Tamarack Elementary School at 0.26 miles to the southwest and Avenal High School ROP at 0.75 miles to the northwest. The closest hospital is Adventist Health Community Care at 0.92 miles to the northwest. The closest daycare facilities are Paramount Child Development Center at 0.54 miles southwest and KCAO Oasis Opportunity at 0.55 miles southwest of the Project. There are no other known schools, hospitals, or nursing homes within a one-mile radius of the Project.

Based on the predicted operational emissions and activity types, the proposed Project is not expected to affect sensitive receptors and is *not expected to have any adverse impacts on any known sensitive receptor*.

5.5. POTENTIAL IMPACTS TO VISIBILITY TO NEARBY CLASS 1 AREAS

It should be noted that visibility impact analyses are not usually conducted for area sources. The recommended analysis methodology was initially intended for stationary sources of emissions which were subject to the Prevention of Significant Deterioration (PSD) requirements in 40 CFR Part 60. Since the Project's emissions are predicted to be significantly less than the PSD threshold levels, an impact at either the Ventana Wilderness or the San Rafael Wilderness (the two nearest Class 1 areas to the Project) is extremely unlikely. Therefore, based on the Project's predicted emissions, the Project is *not expected to have any adverse impact to visibility at any Class 1 Area*.

5.6. POTENTIAL ODOR IMPACTS

The proposed Project is a single-family development located near other residential or multi-family developments. Residential neighborhoods and multi-family developments are not known to be a source of nuisance odors. The Project is therefore not anticipated to have substantial odor impacts. The Project is therefore anticipated to have a *less than significant odor impact*.

5.7. AMBIENT AIR QUALITY IMPACTS

As stated in the GAMAQI (2015, p 96-97), SJVAPCD has developed screening levels for requiring an Ambient Air Quality Analysis (AAQA). The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100

pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

As shown above in Tables 5-1 and 5-2, average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day. *Therefore, an AAQA is not required for this Project.*

5.8. TOXIC AIR CONTAMINANT (TAC) IMPACTS

TACs, as defined by the California Health & Safety Code (CH&SC) §44321, are listed in Appendices AI and AII in AB 2588 Air Toxic “Hot Spots” and Assessment Act’s Emissions Inventory Criteria and Guideline Regulation document. SJVAPCD’s risk management objectives for permitting and CEQA are as follows:

- Minimize health risks from new and modified sources of air pollution.
- Health risks from new and modified sources shall not be significant relative to the background risk levels and other risk levels that are typically accepted throughout the community.
- Avoid unreasonable restrictions on permitting.

The proposed Project is a single-family residential project and is not expected to generate any TAC emissions. The Project would therefore not generate a health risk impact due to TAC emissions. Its potential health risk impacts would therefore be considered *less than significant* and no further health risk assessment is required.

6. CONCLUSIONS

Based on the criteria established by the SJVAPCD's GAMAQI and SPAL guidelines, the proposed Project does not meet the minimum standards to require a full Air Quality Impact Analysis. Furthermore, the Project as proposed would not exceed the SJVAPCD's criteria air pollutant emission levels and would generate *less than significant air quality impacts*.

7. REFERENCES

- California Environmental Quality Act (CEQA). 2019. (Public Resources Code 21000 – 21189) and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387). http://resources.ca.gov/ceqa/docs/2019_CEQA_Statutes_and_Guidelines.pdf
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APPENDIX A: CALEEMOD EMISSIONS ESTIMATES OUTPUT FILES

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation)

Kings County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	122.00	Dwelling Unit	18.65	219,600.00	349

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	37
Climate Zone	3			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Total acreage per Tentative Subdivision Map is 18.65

Construction Phase - CalEEMod default construction timeline and equipment

Vehicle Trips - CalEEMod default trip data

Woodstoves - Per SJVAPCD Rule 4901 amendment (effective Jan. 1, 2020), no wood burning devices allowed at locations <3,000 ft elevation with natural gas access.

Construction Off-road Equipment Mitigation - Per SJVAPCD Regulation VIII

Fleet Mix - SJVAPCD Residential Fleet Mix for operational year 2021

Mobile Land Use Mitigation -

Area Mitigation - Per SJVAPCD Rule 4901 amendment & SJVAPCD landscape equipment assumptions for all projects

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFireplaces	NumberGas	67.10	122.00
tblFireplaces	NumberNoFireplace	54.90	122.00
tblFleetMix	HHD	0.16	0.02
tblFleetMix	LDA	0.49	0.54
tblFleetMix	LDT1	0.03	0.20
tblFleetMix	LDT2	0.15	0.17
tblFleetMix	LHD1	0.02	1.4000e-003
tblFleetMix	LHD2	4.5750e-003	9.0000e-004
tblFleetMix	MCY	5.7820e-003	2.6000e-003
tblFleetMix	MDV	0.12	0.05
tblFleetMix	MH	7.3500e-004	1.6000e-003
tblFleetMix	MHD	0.01	9.0000e-003
tblFleetMix	OBUS	1.7420e-003	0.00
tblFleetMix	SBUS	9.6400e-004	9.0000e-004
tblFleetMix	UBUS	1.8330e-003	4.4000e-003
tblLandUse	LotAcreage	39.61	18.65
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblWoodstoves	NumberCatalytic	18.65	0.00
tblWoodstoves	NumberNoncatalytic	18.65	0.00

2.0 Emissions Summary

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3607	3.2889	2.7401	5.1000e-003	0.2950	0.1688	0.4638	0.1236	0.1579	0.2815	0.0000	447.3315	447.3315	0.1009	0.0000	449.8537
2021	2.1628	0.8870	0.9051	1.6600e-003	0.0275	0.0454	0.0729	7.3700e-003	0.0426	0.0500	0.0000	145.5136	145.5136	0.0306	0.0000	146.2785
Maximum	2.1628	3.2889	2.7401	5.1000e-003	0.2950	0.1688	0.4638	0.1236	0.1579	0.2815	0.0000	447.3315	447.3315	0.1009	0.0000	449.8537

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3607	3.2889	2.7401	5.1000e-003	0.1605	0.1688	0.3294	0.0604	0.1579	0.2183	0.0000	447.3311	447.3311	0.1009	0.0000	449.8533
2021	2.1628	0.8870	0.9051	1.6600e-003	0.0275	0.0454	0.0729	7.3700e-003	0.0426	0.0500	0.0000	145.5135	145.5135	0.0306	0.0000	146.2784
Maximum	2.1628	3.2889	2.7401	5.1000e-003	0.1605	0.1688	0.3294	0.0604	0.1579	0.2183	0.0000	447.3311	447.3311	0.1009	0.0000	449.8533

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	41.69	0.00	25.05	48.25	0.00	19.07	0.00	0.00	0.00	0.00	0.00	0.00

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	1.3496	1.3496
2	4-1-2020	6-30-2020	0.7589	0.7589
3	7-1-2020	9-30-2020	0.7672	0.7672
4	10-1-2020	12-31-2020	0.7690	0.7690
5	1-1-2021	3-31-2021	0.6829	0.6829
6	4-1-2021	6-30-2021	2.3743	2.3743
		Highest	2.3743	2.3743

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1010	0.0935	0.9431	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5730	97.5730	3.2800e-003	1.7600e-003	98.1799
Energy	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	481.1447	481.1447	0.0173	6.0300e-003	483.3746
Mobile	0.4433	1.7453	6.0821	0.0170	1.6141	0.0158	1.6299	0.4316	0.0148	0.4464	0.0000	1,557.1440	1,557.1440	0.0875	0.0000	1,559.3324
Waste						0.0000	0.0000		0.0000	0.0000	25.5038	0.0000	25.5038	1.5072	0.0000	63.1846
Water						0.0000	0.0000		0.0000	0.0000	2.5218	17.6147	20.1365	0.2598	6.2800e-003	28.5033
Total	1.5615	1.9858	7.0877	0.0185	1.6141	0.0394	1.6535	0.4316	0.0384	0.4700	28.0256	2,153.4764	2,181.5020	1.8752	0.0141	2,232.5746

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1006	0.0934	0.9366	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5597	97.5597	3.2600e-003	1.7600e-003	98.1660
Energy	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	481.1447	481.1447	0.0173	6.0300e-003	483.3746
Mobile	0.4400	1.7224	5.9829	0.0167	1.5818	0.0155	1.5973	0.4230	0.0145	0.4375	0.0000	1,527.6602	1,527.6602	0.0864	0.0000	1,529.8196
Waste						0.0000	0.0000		0.0000	0.0000	25.5038	0.0000	25.5038	1.5072	0.0000	63.1846
Water						0.0000	0.0000		0.0000	0.0000	2.5218	17.6147	20.1365	0.2598	6.2800e-003	28.5033
Total	1.5578	1.9627	6.9820	0.0182	1.5818	0.0391	1.6209	0.4230	0.0380	0.4611	28.0256	2,123.9793	2,152.0049	1.8740	0.0141	2,203.0480

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.24	1.16	1.49	1.73	2.00	0.81	1.97	2.00	0.81	1.90	0.00	1.37	1.35	0.06	0.00	1.32

3.0 Construction Detail**Construction Phase**

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2020	1/14/2020	5	10	
2	Grading	Grading	1/15/2020	2/25/2020	5	30	
3	Building Construction	Building Construction	2/26/2020	4/20/2021	5	300	
4	Paving	Paving	4/21/2021	5/18/2021	5	20	
5	Architectural Coating	Architectural Coating	5/19/2021	6/15/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 444,690; Residential Outdoor: 148,230; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	44.00	13.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	9.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	0.0204	0.2121	0.1076	1.9000e-004	0.0903	0.0110	0.1013	0.0497	0.0101	0.0598	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.2 Site Preparation - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6000e-004	4.6000e-004	4.2500e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9436	0.9436	3.0000e-005	0.0000	0.9445
Total	5.6000e-004	4.6000e-004	4.2500e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9436	0.9436	3.0000e-005	0.0000	0.9445

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0352	0.0000	0.0352	0.0194	0.0000	0.0194	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	0.0204	0.2121	0.1076	1.9000e-004	0.0352	0.0110	0.0462	0.0194	0.0101	0.0295	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.2 Site Preparation - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6000e-004	4.6000e-004	4.2500e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9436	0.9436	3.0000e-005	0.0000	0.9445
Total	5.6000e-004	4.6000e-004	4.2500e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9436	0.9436	3.0000e-005	0.0000	0.9445

3.3 Grading - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0668	0.7530	0.4794	9.3000e-004		0.0326	0.0326		0.0300	0.0300	0.0000	81.7264	81.7264	0.0264	0.0000	82.3872
Total	0.0668	0.7530	0.4794	9.3000e-004	0.1301	0.0326	0.1627	0.0540	0.0300	0.0840	0.0000	81.7264	81.7264	0.0264	0.0000	82.3872

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.3 Grading - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8600e-003	1.5400e-003	0.0142	3.0000e-005	3.7500e-003	2.0000e-005	3.7700e-003	1.0000e-003	2.0000e-005	1.0200e-003	0.0000	3.1455	3.1455	1.1000e-004	0.0000	3.1483
Total	1.8600e-003	1.5400e-003	0.0142	3.0000e-005	3.7500e-003	2.0000e-005	3.7700e-003	1.0000e-003	2.0000e-005	1.0200e-003	0.0000	3.1455	3.1455	1.1000e-004	0.0000	3.1483

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0507	0.0000	0.0507	0.0210	0.0000	0.0210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0668	0.7530	0.4794	9.3000e-004		0.0326	0.0326		0.0300	0.0300	0.0000	81.7263	81.7263	0.0264	0.0000	82.3871
Total	0.0668	0.7530	0.4794	9.3000e-004	0.0507	0.0326	0.0834	0.0210	0.0300	0.0510	0.0000	81.7263	81.7263	0.0264	0.0000	82.3871

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3.3 Grading - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8600e-003	1.5400e-003	0.0142	3.0000e-005	3.7500e-003	2.0000e-005	3.7700e-003	1.0000e-003	2.0000e-005	1.0200e-003	0.0000	3.1455	3.1455	1.1000e-004	0.0000	3.1483
Total	1.8600e-003	1.5400e-003	0.0142	3.0000e-005	3.7500e-003	2.0000e-005	3.7700e-003	1.0000e-003	2.0000e-005	1.0200e-003	0.0000	3.1455	3.1455	1.1000e-004	0.0000	3.1483

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0871	257.0871	0.0627	0.0000	258.6551
Total	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0871	257.0871	0.0627	0.0000	258.6551

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5900e-003	0.1671	0.0339	3.8000e-004	8.6900e-003	8.1000e-004	9.5000e-003	2.5100e-003	7.8000e-004	3.2900e-003	0.0000	36.5052	36.5052	4.3500e-003	0.0000	36.6139
Worker	0.0302	0.0251	0.2307	5.7000e-004	0.0610	4.0000e-004	0.0614	0.0162	3.6000e-004	0.0166	0.0000	51.2083	51.2083	1.8400e-003	0.0000	51.2542
Total	0.0358	0.1922	0.2646	9.5000e-004	0.0697	1.2100e-003	0.0709	0.0187	1.1400e-003	0.0199	0.0000	87.7135	87.7135	6.1900e-003	0.0000	87.8681

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0868	257.0868	0.0627	0.0000	258.6548
Total	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0868	257.0868	0.0627	0.0000	258.6548

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3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5900e-003	0.1671	0.0339	3.8000e-004	8.6900e-003	8.1000e-004	9.5000e-003	2.5100e-003	7.8000e-004	3.2900e-003	0.0000	36.5052	36.5052	4.3500e-003	0.0000	36.6139
Worker	0.0302	0.0251	0.2307	5.7000e-004	0.0610	4.0000e-004	0.0614	0.0162	3.6000e-004	0.0166	0.0000	51.2083	51.2083	1.8400e-003	0.0000	51.2542
Total	0.0358	0.1922	0.2646	9.5000e-004	0.0697	1.2100e-003	0.0709	0.0187	1.1400e-003	0.0199	0.0000	87.7135	87.7135	6.1900e-003	0.0000	87.8681

3.4 Building Construction - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3385	90.3385	0.0218	0.0000	90.8834
Total	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3385	90.3385	0.0218	0.0000	90.8834

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3.4 Building Construction - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6600e-003	0.0538	0.0105	1.3000e-004	3.0500e-003	1.6000e-004	3.2100e-003	8.8000e-004	1.5000e-004	1.0300e-003	0.0000	12.7044	12.7044	1.4900e-003	0.0000	12.7418
Worker	9.7900e-003	7.8200e-003	0.0732	1.9000e-004	0.0214	1.4000e-004	0.0216	5.6900e-003	1.2000e-004	5.8200e-003	0.0000	17.4530	17.4530	5.7000e-004	0.0000	17.4673
Total	0.0115	0.0616	0.0837	3.2000e-004	0.0245	3.0000e-004	0.0248	6.5700e-003	2.7000e-004	6.8500e-003	0.0000	30.1574	30.1574	2.0600e-003	0.0000	30.2091

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3384	90.3384	0.0218	0.0000	90.8833
Total	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3384	90.3384	0.0218	0.0000	90.8833

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3.4 Building Construction - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6600e-003	0.0538	0.0105	1.3000e-004	3.0500e-003	1.6000e-004	3.2100e-003	8.8000e-004	1.5000e-004	1.0300e-003	0.0000	12.7044	12.7044	1.4900e-003	0.0000	12.7418
Worker	9.7900e-003	7.8200e-003	0.0732	1.9000e-004	0.0214	1.4000e-004	0.0216	5.6900e-003	1.2000e-004	5.8200e-003	0.0000	17.4530	17.4530	5.7000e-004	0.0000	17.4673
Total	0.0115	0.0616	0.0837	3.2000e-004	0.0245	3.0000e-004	0.0248	6.5700e-003	2.7000e-004	6.8500e-003	0.0000	30.1574	30.1574	2.0600e-003	0.0000	30.2091

3.5 Paving - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.5 Paving - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	6.8000e-004	6.4000e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8900e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5256	1.5256	5.0000e-005	0.0000	1.5269
Total	8.6000e-004	6.8000e-004	6.4000e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8900e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5256	1.5256	5.0000e-005	0.0000	1.5269

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.5 Paving - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	6.8000e-004	6.4000e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8900e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5256	1.5256	5.0000e-005	0.0000	1.5269
Total	8.6000e-004	6.8000e-004	6.4000e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8900e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5256	1.5256	5.0000e-005	0.0000	1.5269

3.6 Architectural Coating - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0611					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	2.0633	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.6 Architectural Coating - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.1000e-004	3.8400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9154	0.9154	3.0000e-005	0.0000	0.9161
Total	5.1000e-004	4.1000e-004	3.8400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9154	0.9154	3.0000e-005	0.0000	0.9161

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0611					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	2.0633	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

3.6 Architectural Coating - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.1000e-004	3.8400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9154	0.9154	3.0000e-005	0.0000	0.9161
Total	5.1000e-004	4.1000e-004	3.8400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	0.9154	0.9154	3.0000e-005	0.0000	0.9161

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Improve Pedestrian Network

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4400	1.7224	5.9829	0.0167	1.5818	0.0155	1.5973	0.4230	0.0145	0.4375	0.0000	1,527.6602	1,527.6602	0.0864	0.0000	1,529.8196
Unmitigated	0.4433	1.7453	6.0821	0.0170	1.6141	0.0158	1.6299	0.4316	0.0148	0.4464	0.0000	1,557.1440	1,557.1440	0.0875	0.0000	1,559.3324

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	1,161.44	1,209.02	1,051.64	4,286,015	4,200,295
Total	1,161.44	1,209.02	1,051.64	4,286,015	4,200,295

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.537300	0.200000	0.167100	0.054200	0.001400	0.000900	0.009000	0.020600	0.000000	0.004400	0.002600	0.000900	0.001600

5.0 Energy Detail

 Historical Energy Use: N

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	310.9292	310.9292	0.0141	2.9100e-003	312.1475
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	310.9292	310.9292	0.0141	2.9100e-003	312.1475
NaturalGas Mitigated	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
NaturalGas Unmitigated	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.18972e+006	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
Total		0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.18972e+006	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
Total		0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.06881e+006	310.9292	0.0141	2.9100e-003	312.1475
Total		310.9292	0.0141	2.9100e-003	312.1475

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

5.3 Energy by Land Use - Electricity**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.06881e+006	310.9292	0.0141	2.9100e-003	312.1475
Total		310.9292	0.0141	2.9100e-003	312.1475

6.0 Area Detail**6.1 Mitigation Measures Area**

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use only Natural Gas Hearths

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1006	0.0934	0.9366	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5597	97.5597	3.2600e-003	1.7600e-003	98.1660
Unmitigated	1.1010	0.0935	0.9431	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5730	97.5730	3.2800e-003	1.7600e-003	98.1799

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.7100e-003	0.0830	0.0353	5.3000e-004		6.7100e-003	6.7100e-003		6.7100e-003	6.7100e-003	0.0000	96.0933	96.0933	1.8400e-003	1.7600e-003	96.6643
Landscaping	0.0275	0.0105	0.9078	5.0000e-005		5.0000e-003	5.0000e-003		5.0000e-003	5.0000e-003	0.0000	1.4797	1.4797	1.4300e-003	0.0000	1.5156
Total	1.1010	0.0935	0.9431	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5730	97.5730	3.2700e-003	1.7600e-003	98.1799

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.7100e-003	0.0830	0.0353	5.3000e-004		6.7100e-003	6.7100e-003		6.7100e-003	6.7100e-003	0.0000	96.0933	96.0933	1.8400e-003	1.7600e-003	96.6643
Landscaping	0.0271	0.0104	0.9013	5.0000e-005		4.9700e-003	4.9700e-003		4.9700e-003	4.9700e-003	0.0000	1.4664	1.4664	1.4100e-003	0.0000	1.5017
Total	1.1006	0.0934	0.9366	5.8000e-004		0.0117	0.0117		0.0117	0.0117	0.0000	97.5597	97.5597	3.2500e-003	1.7600e-003	98.1660

7.0 Water Detail**7.1 Mitigation Measures Water**

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	20.1365	0.2598	6.2800e-003	28.5033
Unmitigated	20.1365	0.2598	6.2800e-003	28.5033

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	7.94879 / 5.01119	20.1365	0.2598	6.2800e-003	28.5033
Total		20.1365	0.2598	6.2800e-003	28.5033

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	7.94879 / 5.01119	20.1365	0.2598	6.2800e-003	28.5033
Total		20.1365	0.2598	6.2800e-003	28.5033

8.0 Waste Detail**8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	25.5038	1.5072	0.0000	63.1846
Unmitigated	25.5038	1.5072	0.0000	63.1846

Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	125.64	25.5038	1.5072	0.0000	63.1846
Total		25.5038	1.5072	0.0000	63.1846

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	125.64	25.5038	1.5072	0.0000	63.1846
Total		25.5038	1.5072	0.0000	63.1846

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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Avenal Housing SPAL (w/ Res Fleet Mix & Mitigation) - Kings County, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Avenal Housing SPAL (BAU - 2005) - Kings County, Annual

Avenal Housing SPAL (BAU - 2005)

Kings County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	122.00	Dwelling Unit	18.65	219,600.00	349

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	37
Climate Zone	3			Operational Year	2005
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Avenal Housing SPAL (BAU - 2005) - Kings County, Annual

Project Characteristics -

Land Use - Total acreage per Tentative Subdivision Map is 18.65

Construction Phase - CalEEMod default construction timeline and equipment

Vehicle Trips - CalEEMod default trip data

Woodstoves -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Fleet Mix -

Area Coating -

Architectural Coating -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	39.61	18.65
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblWoodstoves	NumberCatalytic	18.65	0.00
tblWoodstoves	NumberNoncatalytic	18.65	0.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2004	1.5150	8.3365	6.0813	0.0509	0.2950	0.5633	0.8583	0.1236	0.5623	0.6859	0.0000	517.2156	517.2156	0.1277	0.0000	520.4077
2005	3.8594	2.3014	1.5769	0.0164	0.0275	0.1715	0.1990	7.3700e-003	0.1712	0.1786	0.0000	167.5641	167.5641	0.0400	0.0000	168.5641
Maximum	3.8594	8.3365	6.0813	0.0509	0.2950	0.5633	0.8583	0.1236	0.5623	0.6859	0.0000	517.2156	517.2156	0.1277	0.0000	520.4077

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2004	1.5150	8.3365	6.0813	0.0509	0.2950	0.5633	0.8583	0.1236	0.5623	0.6859	0.0000	517.2151	517.2151	0.1277	0.0000	520.4072
2005	3.8594	2.3014	1.5769	0.0164	0.0275	0.1715	0.1990	7.3700e-003	0.1712	0.1786	0.0000	167.5640	167.5640	0.0400	0.0000	168.5640
Maximum	3.8594	8.3365	6.0813	0.0509	0.2950	0.5633	0.8583	0.1236	0.5623	0.6859	0.0000	517.2151	517.2151	0.1277	0.0000	520.4072

[illegible]

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2004	3-31-2004	3.3739	3.3739
2	4-1-2004	6-30-2004	2.1335	2.1335
3	7-1-2004	9-30-2004	2.1569	2.1569
4	10-1-2004	12-31-2004	2.1759	2.1759
5	1-1-2005	3-31-2005	1.8107	1.8107
6	4-1-2005	6-30-2005	4.3727	4.3727
		Highest	4.3727	4.3727

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043
Energy	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	481.1447	481.1447	0.0173	6.0300e-003	483.3746
Mobile	3.2076	24.6279	30.5825	0.1773	1.6589	0.6041	2.2631	0.4478	0.5772	1.0250	0.0000	3,167.403 3	3,167.403 3	1.0006	0.0000	3,192.417 6
Waste						0.0000	0.0000		0.0000	0.0000	25.5038	0.0000	25.5038	1.5072	0.0000	63.1846
Water						0.0000	0.0000		0.0000	0.0000	2.5218	17.6147	20.1365	0.2598	6.2800e-003	28.5033
Total	4.4767	24.8348	31.7151	0.1785	1.6589	0.6241	2.2831	0.4478	0.5972	1.0450	28.0256	3,720.493 8	3,748.519 4	2.7883	0.0133	3,822.184 3

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2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043
Energy	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	481.1447	481.1447	0.0173	6.0300e-003	483.3746
Mobile	3.2076	24.6279	30.5825	0.1773	1.6589	0.6041	2.2631	0.4478	0.5772	1.0250	0.0000	3,167.4033	3,167.4033	1.0006	0.0000	3,192.4176
Waste						0.0000	0.0000		0.0000	0.0000	25.5038	0.0000	25.5038	1.5072	0.0000	63.1846
Water						0.0000	0.0000		0.0000	0.0000	2.5218	17.6147	20.1365	0.2598	6.2800e-003	28.5033
Total	4.4767	24.8348	31.7151	0.1785	1.6589	0.6241	2.2831	0.4478	0.5972	1.0450	28.0256	3,720.4938	3,748.5194	2.7883	0.0133	3,822.1843

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2004	1/14/2004	5	10	
2	Grading	Grading	1/15/2004	2/25/2004	5	30	
3	Building Construction	Building Construction	2/26/2004	4/20/2005	5	300	
4	Paving	Paving	4/21/2005	5/18/2005	5	20	
5	Architectural Coating	Architectural Coating	5/19/2005	6/15/2005	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 444,690; Residential Outdoor: 148,230; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	44.00	13.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	9.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction**3.2 Site Preparation - 2004****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0561	0.4016	0.1539	2.2500e-003		0.0252	0.0252		0.0252	0.0252	0.0000	20.0023	20.0023	4.5700e-003	0.0000	20.1165
Total	0.0561	0.4016	0.1539	2.2500e-003	0.0903	0.0252	0.1156	0.0497	0.0252	0.0749	0.0000	20.0023	20.0023	4.5700e-003	0.0000	20.1165

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3400e-003	4.1200e-003	0.0359	2.0000e-005	1.1200e-003	4.0000e-005	1.1700e-003	3.0000e-004	4.0000e-005	3.4000e-004	0.0000	1.1771	1.1771	2.0000e-004	0.0000	1.1822
Total	3.3400e-003	4.1200e-003	0.0359	2.0000e-005	1.1200e-003	4.0000e-005	1.1700e-003	3.0000e-004	4.0000e-005	3.4000e-004	0.0000	1.1771	1.1771	2.0000e-004	0.0000	1.1822

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3.2 Site Preparation - 2004**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0561	0.4016	0.1539	2.2500e-003		0.0252	0.0252		0.0252	0.0252	0.0000	20.0023	20.0023	4.5700e-003	0.0000	20.1164
Total	0.0561	0.4016	0.1539	2.2500e-003	0.0903	0.0252	0.1156	0.0497	0.0252	0.0749	0.0000	20.0023	20.0023	4.5700e-003	0.0000	20.1164

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3400e-003	4.1200e-003	0.0359	2.0000e-005	1.1200e-003	4.0000e-005	1.1700e-003	3.0000e-004	4.0000e-005	3.4000e-004	0.0000	1.1771	1.1771	2.0000e-004	0.0000	1.1822
Total	3.3400e-003	4.1200e-003	0.0359	2.0000e-005	1.1200e-003	4.0000e-005	1.1700e-003	3.0000e-004	4.0000e-005	3.4000e-004	0.0000	1.1771	1.1771	2.0000e-004	0.0000	1.1822

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3.3 Grading - 2004**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2268	1.8263	0.9233	0.0103		0.0963	0.0963		0.0963	0.0963	0.0000	98.1543	98.1543	0.0184	0.0000	98.6154
Total	0.2268	1.8263	0.9233	0.0103	0.1301	0.0963	0.2264	0.0540	0.0963	0.1503	0.0000	98.1543	98.1543	0.0184	0.0000	98.6154

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0111	0.0137	0.1198	7.0000e-005	3.7500e-003	1.5000e-004	3.9000e-003	1.0000e-003	1.4000e-004	1.1300e-003	0.0000	3.9237	3.9237	6.8000e-004	0.0000	3.9408
Total	0.0111	0.0137	0.1198	7.0000e-005	3.7500e-003	1.5000e-004	3.9000e-003	1.0000e-003	1.4000e-004	1.1300e-003	0.0000	3.9237	3.9237	6.8000e-004	0.0000	3.9408

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3.3 Grading - 2004**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2268	1.8263	0.9233	0.0103		0.0963	0.0963		0.0963	0.0963	0.0000	98.1542	98.1542	0.0184	0.0000	98.6153
Total	0.2268	1.8263	0.9233	0.0103	0.1301	0.0963	0.2264	0.0540	0.0963	0.1503	0.0000	98.1542	98.1542	0.0184	0.0000	98.6153

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0111	0.0137	0.1198	7.0000e-005	3.7500e-003	1.5000e-004	3.9000e-003	1.0000e-003	1.4000e-004	1.1300e-003	0.0000	3.9237	3.9237	6.8000e-004	0.0000	3.9408
Total	0.0111	0.0137	0.1198	7.0000e-005	3.7500e-003	1.5000e-004	3.9000e-003	1.0000e-003	1.4000e-004	1.1300e-003	0.0000	3.9237	3.9237	6.8000e-004	0.0000	3.9408

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3.4 Building Construction - 2004**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.9685	5.3571	2.4819	0.0338		0.4212	0.4212		0.4212	0.4212	0.0000	291.7757	291.7757	0.0789	0.0000	293.7475
Total	0.9685	5.3571	2.4819	0.0338		0.4212	0.4212		0.4212	0.4212	0.0000	291.7757	291.7757	0.0789	0.0000	293.7475

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0678	0.5102	0.4161	3.4800e-003	8.6900e-003	0.0179	0.0266	2.5100e-003	0.0172	0.0197	0.0000	38.3048	38.3048	0.0138	0.0000	38.6496
Worker	0.1814	0.2235	1.9504	1.0800e-003	0.0610	2.4400e-003	0.0635	0.0162	2.2600e-003	0.0185	0.0000	63.8777	63.8777	0.0111	0.0000	64.1558
Total	0.2492	0.7337	2.3665	4.5600e-003	0.0697	0.0204	0.0901	0.0187	0.0194	0.0382	0.0000	102.1824	102.1824	0.0249	0.0000	102.8054

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3.4 Building Construction - 2004**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.9685	5.3571	2.4819	0.0338		0.4212	0.4212		0.4212	0.4212	0.0000	291.7754	291.7754	0.0789	0.0000	293.7472
Total	0.9685	5.3571	2.4819	0.0338		0.4212	0.4212		0.4212	0.4212	0.0000	291.7754	291.7754	0.0789	0.0000	293.7472

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0678	0.5102	0.4161	3.4800e-003	8.6900e-003	0.0179	0.0266	2.5100e-003	0.0172	0.0197	0.0000	38.3048	38.3048	0.0138	0.0000	38.6496
Worker	0.1814	0.2235	1.9504	1.0800e-003	0.0610	2.4400e-003	0.0635	0.0162	2.2600e-003	0.0185	0.0000	63.8777	63.8777	0.0111	0.0000	64.1558
Total	0.2492	0.7337	2.3665	4.5600e-003	0.0697	0.0204	0.0901	0.0187	0.0194	0.0382	0.0000	102.1824	102.1824	0.0249	0.0000	102.8054

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3.4 Building Construction - 2005**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2931	1.6164	0.7951	0.0119		0.1357	0.1357		0.1357	0.1357	0.0000	102.5158	102.5158	0.0239	0.0000	103.1139
Total	0.2931	1.6164	0.7951	0.0119		0.1357	0.1357		0.1357	0.1357	0.0000	102.5158	102.5158	0.0239	0.0000	103.1139

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0169	0.1703	0.0876	1.2400e-003	3.0500e-003	4.9900e-003	8.0400e-003	8.8000e-004	4.7700e-003	5.6500e-003	0.0000	13.1986	13.1986	6.6500e-003	0.0000	13.3648
Worker	0.0428	0.0486	0.4329	2.5000e-004	0.0214	5.0000e-004	0.0219	5.6900e-003	4.7000e-004	6.1600e-003	0.0000	22.1053	22.1053	3.5900e-003	0.0000	22.1951
Total	0.0597	0.2188	0.5205	1.4900e-003	0.0245	5.4900e-003	0.0300	6.5700e-003	5.2400e-003	0.0118	0.0000	35.3039	35.3039	0.0102	0.0000	35.5599

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3.4 Building Construction - 2005**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2931	1.6164	0.7951	0.0119		0.1357	0.1357		0.1357	0.1357	0.0000	102.5157	102.5157	0.0239	0.0000	103.1137
Total	0.2931	1.6164	0.7951	0.0119		0.1357	0.1357		0.1357	0.1357	0.0000	102.5157	102.5157	0.0239	0.0000	103.1137

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0169	0.1703	0.0876	1.2400e-003	3.0500e-003	4.9900e-003	8.0400e-003	8.8000e-004	4.7700e-003	5.6500e-003	0.0000	13.1986	13.1986	6.6500e-003	0.0000	13.3648
Worker	0.0428	0.0486	0.4329	2.5000e-004	0.0214	5.0000e-004	0.0219	5.6900e-003	4.7000e-004	6.1600e-003	0.0000	22.1053	22.1053	3.5900e-003	0.0000	22.1951
Total	0.0597	0.2188	0.5205	1.4900e-003	0.0245	5.4900e-003	0.0300	6.5700e-003	5.2400e-003	0.0118	0.0000	35.3039	35.3039	0.0102	0.0000	35.5599

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3.5 Paving - 2005**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2176
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2176

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7400e-003	4.2400e-003	0.0378	2.0000e-005	1.8700e-003	4.0000e-005	1.9200e-003	5.0000e-004	4.0000e-005	5.4000e-004	0.0000	1.9323	1.9323	3.1000e-004	0.0000	1.9401
Total	3.7400e-003	4.2400e-003	0.0378	2.0000e-005	1.8700e-003	4.0000e-005	1.9200e-003	5.0000e-004	4.0000e-005	5.4000e-004	0.0000	1.9323	1.9323	3.1000e-004	0.0000	1.9401

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3.5 Paving - 2005**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2175
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2175

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7400e-003	4.2400e-003	0.0378	2.0000e-005	1.8700e-003	4.0000e-005	1.9200e-003	5.0000e-004	4.0000e-005	5.4000e-004	0.0000	1.9323	1.9323	3.1000e-004	0.0000	1.9401
Total	3.7400e-003	4.2400e-003	0.0378	2.0000e-005	1.8700e-003	4.0000e-005	1.9200e-003	5.0000e-004	4.0000e-005	5.4000e-004	0.0000	1.9323	1.9323	3.1000e-004	0.0000	1.9401

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3.6 Architectural Coating - 2005**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4352					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5200e-003	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686
Total	3.4428	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2400e-003	2.5500e-003	0.0227	1.0000e-005	1.1200e-003	3.0000e-005	1.1500e-003	3.0000e-004	2.0000e-005	3.2000e-004	0.0000	1.1594	1.1594	1.9000e-004	0.0000	1.1641
Total	2.2400e-003	2.5500e-003	0.0227	1.0000e-005	1.1200e-003	3.0000e-005	1.1500e-003	3.0000e-004	2.0000e-005	3.2000e-004	0.0000	1.1594	1.1594	1.9000e-004	0.0000	1.1641

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3.6 Architectural Coating - 2005**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4352					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5200e-003	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686
Total	3.4428	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2400e-003	2.5500e-003	0.0227	1.0000e-005	1.1200e-003	3.0000e-005	1.1500e-003	3.0000e-004	2.0000e-005	3.2000e-004	0.0000	1.1594	1.1594	1.9000e-004	0.0000	1.1641
Total	2.2400e-003	2.5500e-003	0.0227	1.0000e-005	1.1200e-003	3.0000e-005	1.1500e-003	3.0000e-004	2.0000e-005	3.2000e-004	0.0000	1.1594	1.1594	1.9000e-004	0.0000	1.1641

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.2076	24.6279	30.5825	0.1773	1.6589	0.6041	2.2631	0.4478	0.5772	1.0250	0.0000	3,167.4033	3,167.4033	1.0006	0.0000	3,192.4176
Unmitigated	3.2076	24.6279	30.5825	0.1773	1.6589	0.6041	2.2631	0.4478	0.5772	1.0250	0.0000	3,167.4033	3,167.4033	1.0006	0.0000	3,192.4176

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	1,161.44	1,209.02	1051.64	4,286,015	4,286,015
Total	1,161.44	1,209.02	1,051.64	4,286,015	4,286,015

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	16.80	7.10	7.90	42.30	19.60	38.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.404531	0.053546	0.132256	0.184203	0.044106	0.005671	0.014637	0.148129	0.001331	0.002758	0.005848	0.001227	0.001758

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	310.9292	310.9292	0.0141	2.9100e-003	312.1475
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	310.9292	310.9292	0.0141	2.9100e-003	312.1475
NaturalGas Mitigated	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
NaturalGas Unmitigated	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

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5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.18972e+006	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
Total		0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.18972e+006	0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271
Total		0.0172	0.1470	0.0625	9.4000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	170.2156	170.2156	3.2600e-003	3.1200e-003	171.2271

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.06881e+006	310.9292	0.0141	2.9100e-003	312.1475
Total		310.9292	0.0141	2.9100e-003	312.1475

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.06881e+006	310.9292	0.0141	2.9100e-003	312.1475
Total		310.9292	0.0141	2.9100e-003	312.1475

6.0 Area Detail**6.1 Mitigation Measures Area**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043
Unmitigated	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3435					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.3400e-003	0.0456	0.0194	2.9000e-004		3.6900e-003	3.6900e-003		3.6900e-003	3.6900e-003	0.0000	52.8513	52.8513	1.0100e-003	9.7000e-004	53.1654
Landscaping	0.0455	0.0143	1.0506	5.0000e-005		4.4400e-003	4.4400e-003		4.4400e-003	4.4400e-003	0.0000	1.4797	1.4797	2.3700e-003	0.0000	1.5390
Total	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043

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6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3435					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.3400e-003	0.0456	0.0194	2.9000e-004		3.6900e-003	3.6900e-003		3.6900e-003	3.6900e-003	0.0000	52.8513	52.8513	1.0100e-003	9.7000e-004	53.1654
Landscaping	0.0455	0.0143	1.0506	5.0000e-005		4.4400e-003	4.4400e-003		4.4400e-003	4.4400e-003	0.0000	1.4797	1.4797	2.3700e-003	0.0000	1.5390
Total	1.2520	0.0599	1.0700	3.4000e-004		8.1300e-003	8.1300e-003		8.1300e-003	8.1300e-003	0.0000	54.3310	54.3310	3.3800e-003	9.7000e-004	54.7043

7.0 Water Detail**7.1 Mitigation Measures Water**

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	20.1365	0.2598	6.2800e-003	28.5033
Unmitigated	20.1365	0.2598	6.2800e-003	28.5033

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	7.94879 / 5.01119	20.1365	0.2598	6.2800e-003	28.5033
Total		20.1365	0.2598	6.2800e-003	28.5033

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7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	7.94879 / 5.01119	20.1365	0.2598	6.2800e-003	28.5033
Total		20.1365	0.2598	6.2800e-003	28.5033

8.0 Waste Detail**8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	25.5038	1.5072	0.0000	63.1846
Unmitigated	25.5038	1.5072	0.0000	63.1846

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8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	125.64	25.5038	1.5072	0.0000	63.1846
Total		25.5038	1.5072	0.0000	63.1846

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	125.64	25.5038	1.5072	0.0000	63.1846
Total		25.5038	1.5072	0.0000	63.1846

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

Avenal Housing SPAL (BAU - 2005) - Kings County, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

APPENDIX B
CULTURAL RESOURCES TECHNICAL MEMO



TECHNICAL MEMORANDUM

Date: October 24, 2019

Project: Cultural resources records search for Tentative Tract Map 927 – City of Avenal, CA

To: Jaymie Brauer

From: Robert Parr, MS, RPA, Senior Archaeologist

Subject: Cultural Resources Records Search Results (RS #19-401)

Background

The purpose of the search was to determine whether any known cultural resources or previously conducted cultural resource surveys were located on or near the subject property, and whether construction of the Project would impact any known or potential cultural resources under the California Environmental Quality Act (CEQA). The Project requires approval of Tentative Tract Map 927.

Project Description

is proposing to construct a 122-lot single family residential development (Project) within the City of Avenal in the western portion of Kings County, California. The residential development would occupy approximately 18.65 acres of Accessor's Parcel Number (APN) 038-260-055. The Project would require a General Plan Amendment, zone change, a zone variance and Tentative Tract Map approval. The Project would also include the construction of an internal circulation network to provide access to the Project site.

Location

The subject parcel is situated Southeast corner of Kern Street and Corcoran Avenue in Avenal, California. within Section 22, Township 22 South, Range 17 East, Mount Diablo Base and Meridian (MDB&M), within the Kettleman Plain U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The site encompasses approximately 18.65-acre portion of Assessor's Parcel Number (APN) 038-260-055 (Figures 1-4).

Methodology

The records search covered an area within one-half mile of the Project and included a review of the *National Register of Historic Places*, *California Points of Historical Interest*, *California Registry of Historic Resources*, *California Historical Landmarks*, *California State Historic Resources Inventory*, and a review of cultural resource reports on file.



TECHNICAL MEMORANDUM

Results

Records Search

A cultural resources records search (RS #19-401) was conducted for the Project at the Southern San Joaquin Valley Information Center at California State University, Bakersfield in order to determine whether any known cultural resources or previously conducted cultural resource surveys were located on or near the Project.

The records search covered an area within one-half mile of the subject property and included a review of the *National Register of Historic Places*, *California Points of Historical Interest*, *California Registry of Historic Resources*, *California Historical Landmarks*, *California State Historic Resources Inventory*, and a review of cultural resource reports on file.

The records search indicated that an approximately 10-acre strip along the southern edge of the property parallel and adjacent to Grangeville Blvd. previously had been surveyed for cultural resources with negative results (Beck 1979). It was not known if any cultural resources were present on the remainder of the parcel. One additional cultural resource study had been conducted within a half mile of the property (Wren 2001).

Two cultural resource sites have been recorded within a half mile of the property. These include the historic Last Chance Ditch system (P-16-000128), a system of irrigation canals that was originally constructed in 1873-74, and a prehistoric habitation site (P-16-000004).

Field Survey

A Class III inventory/Phase I cultural resources survey of the entire 27.27 acres of the subject property was conducted by Robert E. Parr, RPA, on October 9, 2019 employing east-west transects spaced 10 meters apart. The property is flat, agricultural land that at the time of the survey had been recently disked subsequent to crop cultivation. The soil is a fine, tan-gray silt with small, water-worn pebbles occurring only rarely. Ground visibility throughout the property was excellent (See Attachment B- Photographs).

No cultural material was identified on the subject parcel as a result of the field survey.

A Sacred Land Files search was requested from the Native American Heritage Commission (NAHC), and a response was received on October 15, 2019. As noted, the NAHC *Sacred Lands File* did not indicate the presence of any cultural places within the Project area (Attachment C).



TECHNICAL MEMORANDUM

Conclusions and Recommendations

Based on the results of cultural records search findings and the lack of historical or archaeological resources previously identified within a 0.5-mile radius of the proposed Project, the potential to encounter subsurface historical or archaeological deposits is would be considered unlikely. Operation of the proposed Project would not result in impacts related to the disturbance of archaeological or historical resources.

However, there is still a possibility that historical or archaeological materials may be exposed during construction activities. Grading and trenching, as well as other ground-disturbing actions have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the Project area, including historical or archaeological resources. Disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact under CEQA.

Implementation of recommended Mitigation Measure MM CUL-1 and MM CUL-2 would reduce potential impacts on cultural resources and historical resources associated with the proposed Project to less-than-significant levels.

Recommended Mitigation Measures

MM CUL-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, can evaluate the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified professional archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.

If a potentially-eligible resource is encountered, then the qualified professional archaeologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.

MM CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed.



TECHNICAL MEMORANDUM

Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the County coroner. All reports, correspondence, and determinations regarding the discovery of human remains on the project site shall be submitted to the Lead Agency.

Robert E. Parr

(s) Robert E. Parr, MS, RPA
Senior Archaeologist

190333

Attachment A- Figures

Attachment B- Photographs

Attachment C- NAHC Sacred Lands File Results

References

Beck, Alan

1979 Archaeological Reconnaissance for the Grangeville Boulevard Reconstruction
Environmental Impact Report. (KI-00004).

Wren, Donald G.

2001 A Cultural Resource Study, New Hanford High School Hanford Learning Center Project,
Hanford, California. (KI-00105)

ATTACHMENT A
PROJECT FIGURES



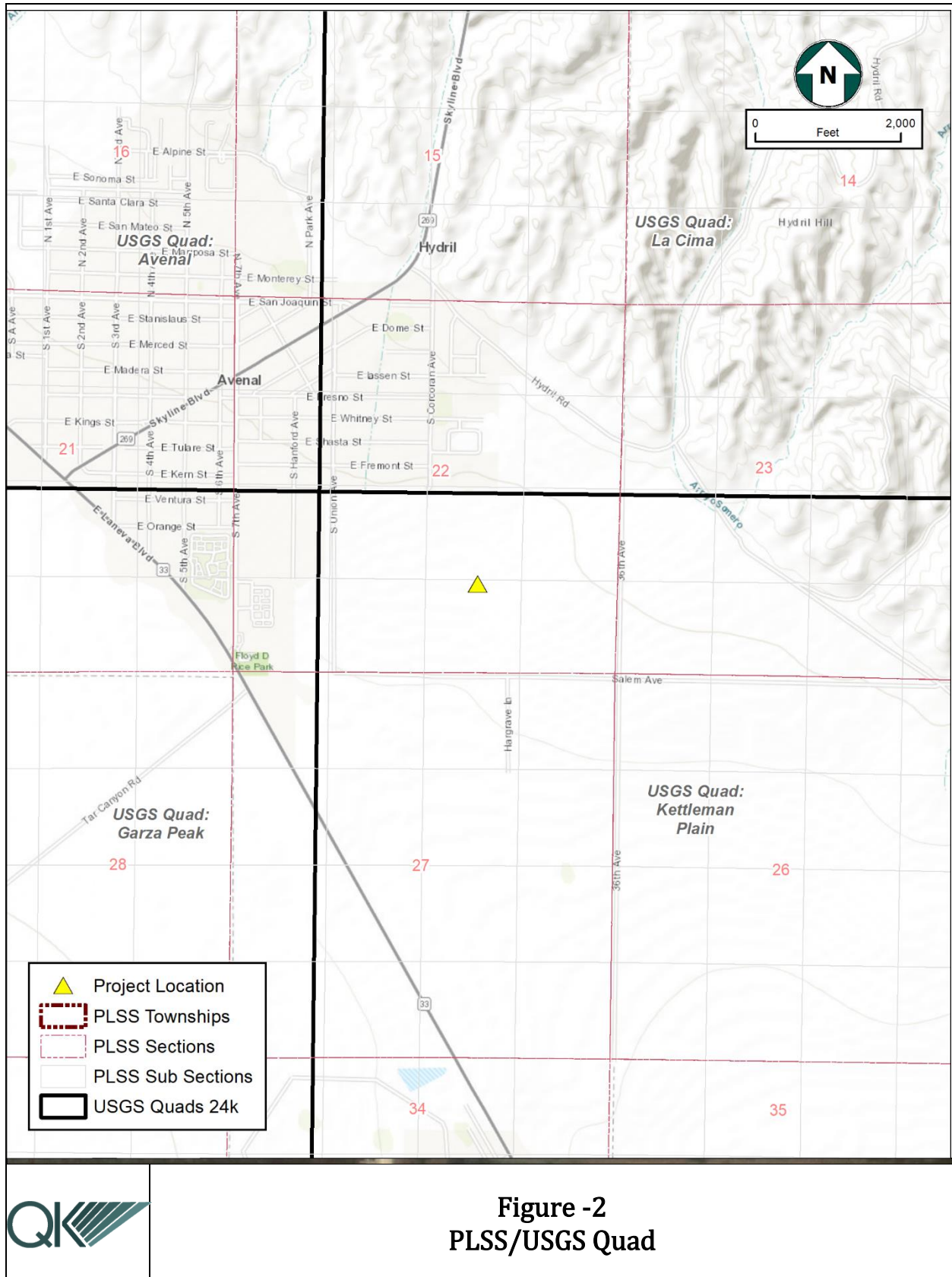


Figure -2
PLSS/USGS Quad

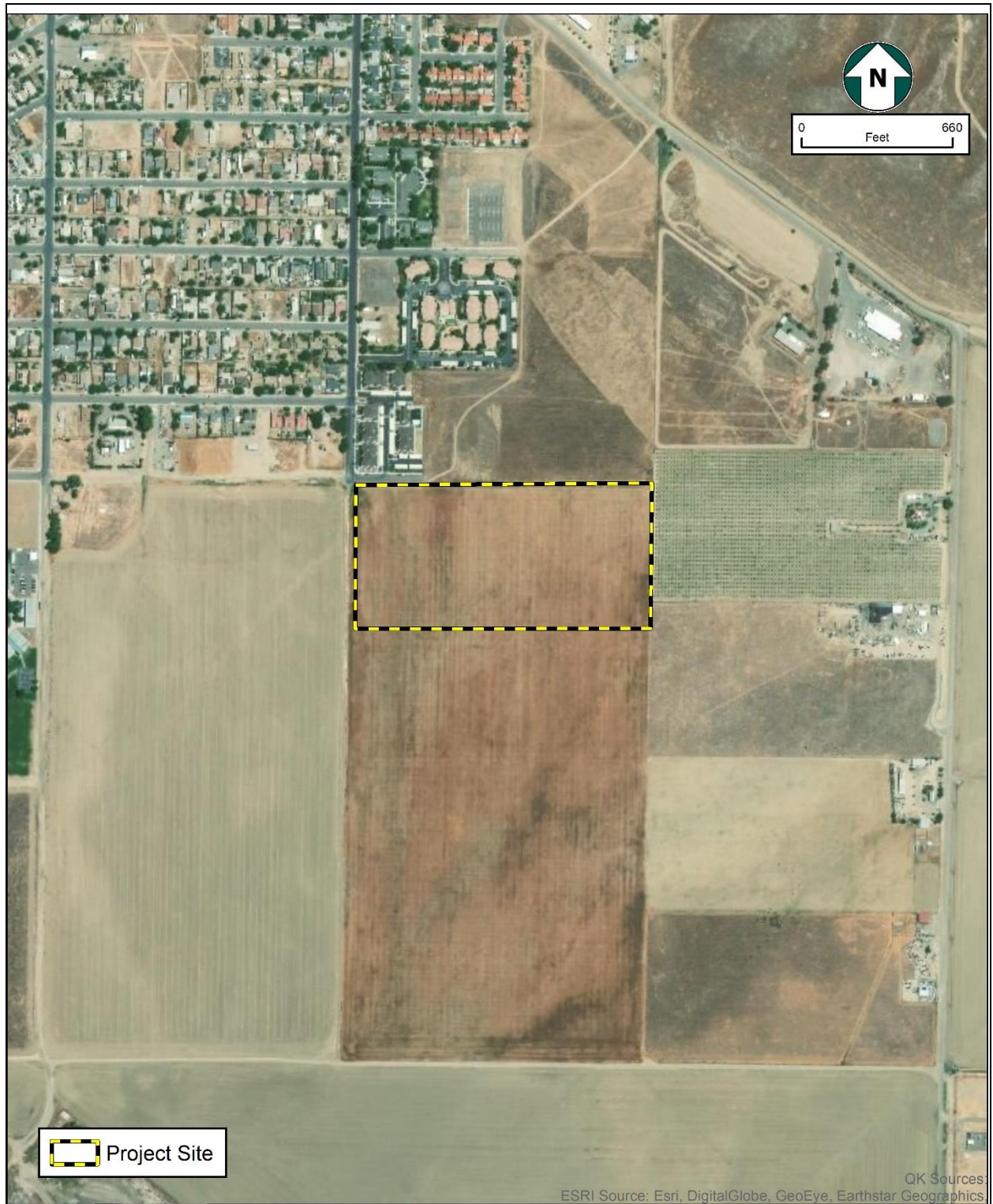


Figure -3
Project Site

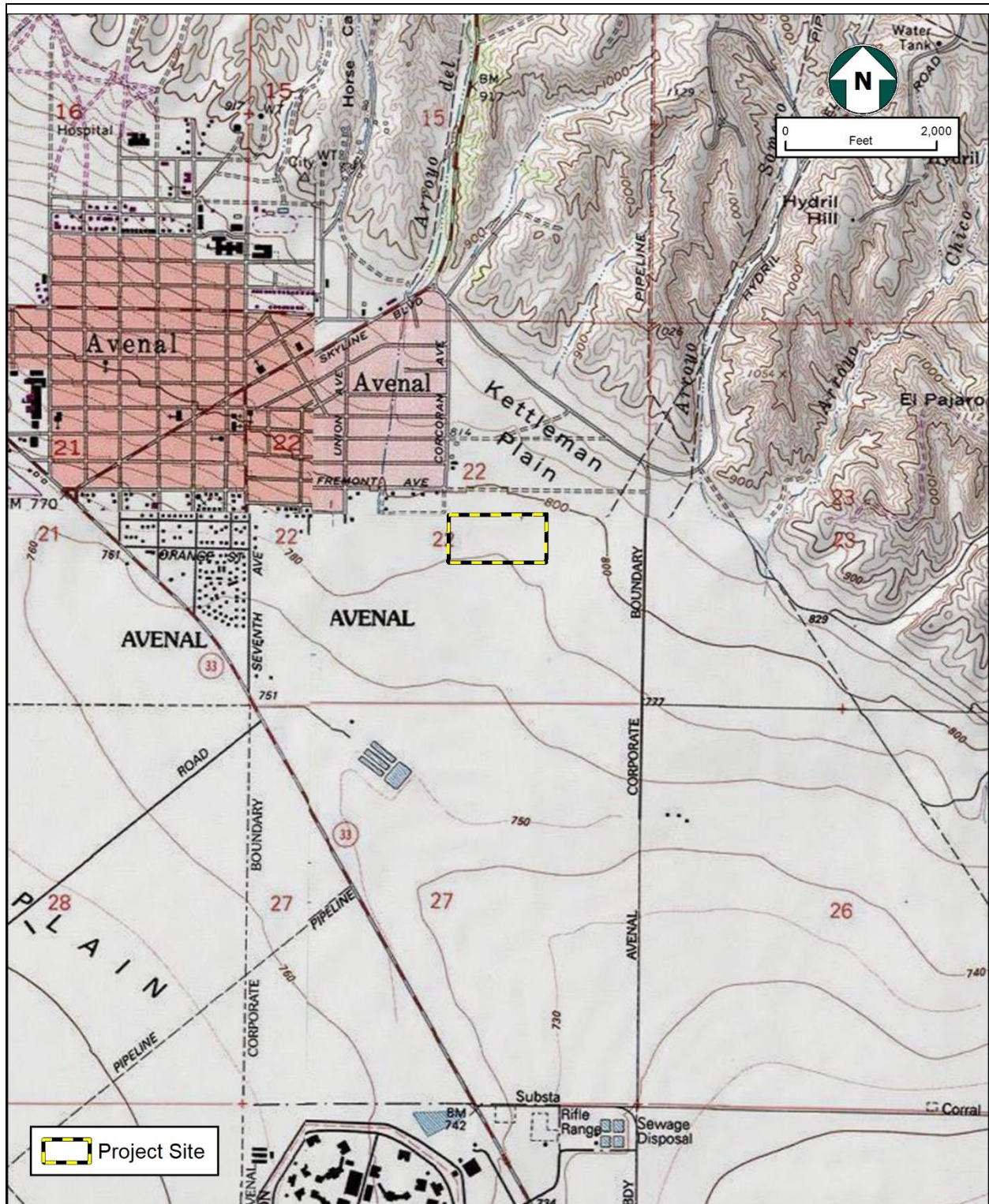


Figure -4
Topo

ATTACHMENT C
NAHC SACRED LANDS FILE RESULTS

Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: <http://www.nahc.ca.gov>



Jaymie Brauer
QK

RE: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Avenal Subdivision Construction Project, Kings County

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) (“Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.”)

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

- Any report that may contain site forms, site significance, and suggested mitigation measures.

All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.
4. Any ethnographic studies conducted for any area including all or part of the APE; and
5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,



Andrew Green
Staff Services Analyst

Attachment

**Native American Heritage Commission
Native American Contacts List
October 24, 2019**

Kings River Choinumni Farm Tribe Stan Alec 3515 East Fedora Avenue Fresno ,CA 93726 (559) 647-3227 Cell	Foothill Yokuts Choinumni	Wuksache Indian Tribe/Eshom Valley Band Kenneth Woodrow, Chairperson 1179 Rock Haven Ct. Salinas ,CA 93906 kwood8934@aol.com (831) 443-9702	Foothill Yokuts Mono Wuksache
Santa Rosa Rancheria Tachi Yokut Tribe Rueben Barrios Sr., Chairperson P.O. Box 8 Lemoore ,CA 93245 (559) 924-1278 (559) 924-3583 Fax	Tache Tachi Yokut		
Table Mountain Rancheria Leanne Walker-Grant, Chairperson P.O. Box 410 Friant ,CA 93626 rpennell@tmr.org (559) 822-2587 (559) 822-2693 Fax	Yokuts		
Table Mountain Rancheria Bob Pennell, Cultural Resources Director P.O. Box 410 Friant ,CA 93626 rpennell@tmr.org (559) 325-0351 (559) 325-0394 Fax	Yokuts		
Tule River Indian Tribe Neil Peyron, Chairperson P.O. Box 589 Porterville ,CA 93258 neil.peyron@tulerivertribe-nsn.gov (559) 781-4271 (559) 781-4610 Fax	Yokuts		

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

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

**This list is only applicable for contacting local Native Americans Tribes for the proposed:
Avenal Subdivision Construction Project, Kings County.**



City of Avenal

919 Skyline Blvd

Avenal, CA 93204

Phone (559) 386-5766

Fax: (559) 386-0629

December 4, 2019

SUBJECT: Project Notification Pursuant to Senate Bill (SB) 18 for General Plan Amendment /
Rezone of APN 038-260-055 – Avenal, CA

To Whom It May Concern:

Pursuant to the provisions of SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the City of Avenal hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of General Plan Amendment / Rezoning of APN 038-260-055 in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

To assist in your evaluation, the applicant's environmental consultant conducted a Sacred Lands File check through the Native American Heritage Commission, which was completed with **negative results**.

The applicant/owner of the parcel proposes to change the land use of Assessor's Parcel Number (APN) 038-260-055, an 18.65 acre parcel located on the southeast corner of Kern Street and Corcoran Avenue within the City of Avenal, from Community Commercial/Park/High Density Residential to Low Density Residential. Accordingly, the site would be rezoned from a split zoning of CC/P/R3 to an R1 designation. The applicant/owner plans to develop the site into a 122-lot single-family housing subdivision, with a neighborhood park serving the residents of the subdivision. Lots would be a minimum of 5,000 sq. ft. and as large as over 10,000 sq. ft.

If you desire to consult with the City on the review of this project, please respond in writing within ninety (90) days of the date of this letter.



City of Avenal

919 Skyline Blvd

Avenal, CA 93204

Phone (559) 386-5766

Fax: (559) 386-0629

Should the City not receive a response within ninety (90) days, it will be presumed that you have declined consultation. Thank you for your consideration on this matter and please do not hesitate to contact me should you have any questions or need additional information.

Sincerely,

Fernando Santillan

Fernando Santillan
Community & Economic Development Director
City of Avenal
Direct Phone: (559) 633-3086
Email: fsantillan@cityofavenal.com

Attachments:
Project Location Exhibits

APPENDIX C
GEOTECHNICAL REPORT



December 19, 2019

Project No. 19G-0600-0

Douglas R. Scheidt, PE
Executive Vice President
Highlands Diversified, Inc.
5114 East Clinton Way
Fresno, California 93727

**Subject: Addendum to Geotechnical Investigation Report
New Subdivision
Southeast Corner of Kern Street and Corcoran Ave
APN 038-260-055
Avenal, California 93204**

Dear Mr. Scheidt:

At your request, RMA GeoScience (RMA) has prepared this addendum based on our December 18, 2019 telephone conversation. RMA has completed the subject project report entitled "Geotechnical Investigation Report, New Subdivision, Southeast Corner of Kern Street and Corcoran Avenue, APN 038-260-055, Avenal, California 93204", dated November 25, 2019. This addendum presents geotechnical conclusion and recommendations for use of lime treatment in Earthwork, Section 3.04.

Based on specific data and information contained in the November 25, 2019 geotechnical report, our understanding of the project, and our geotechnical engineering experience, it is our professional judgment that lime treatment in lieu of removal of expansive on-site soils and replacement with non-expansive soils during earthwork is geotechnically feasible. Design provisions should be included in design for moisture control in order to mitigate potential expansion of soils. Specific geotechnical recommendations are presented below to address these soil conditions and provide information for other members of the design team to prepare the project plans and specifications for the planned construction.

All vegetation, organic rich soils (soils containing more than 2 percent organics by weight), trash, and debris should be cleared from the grading area and removed from the site. It is anticipated that the upper three to four inches of soil will need to be stripped in order to remove the organic rich materials from the building pad and paved areas of the site. Prior to performing the over-excavation recommended below, the stripped surface should be observed and approved by the Project Geotechnical Engineer. After the removal of deleterious materials and the stripping of organic-rich soils, the following over-excavation must be done within the area of the planned improvements:

- Within the area of the planned building improvements plus at least 5 feet horizontally beyond the perimeter of these improvements, the upper 18 inches of subgrade soils below the concrete slab-on-grade should consist of lime treated on-site native clayey soils with up to 5 percent quicklime, based on dry unit weight of the soils. A specialty contractor experienced with lime treatment should be contracted to perform this task.

- Outside of “building pad” areas indicated above, and within the areas of planned asphalt pavement or concrete flatwork, the upper 12 inches of subgrade soils below the concrete slab-on-grade should consist of lime treated on-site native clayey soils with up to 5 percent quicklime. A specialty contractor experienced with lime treatment should be contracted to perform this task.

Recommended minimum pavement sections based on lime treated subgrade are provided in the table below:

Design TI	Recommended Minimum Pavement Section
≤ 5.0	3.0" AC over 4.0" Class 2 AB
5.5	3.0" AC over 4.5" Class 2 AB
6.0	4.0" AC over 4.5" Class 2 AB

If you have any questions regarding the information contained in this letter, please contact the undersigned at your convenience.

Respectfully Submitted,
RMA GeoScience



Josue Montes, P.E., G.E.
Principal Geotechnical Engineer



Distribution: Addressee (2 Originals and one pdf copy to DScheidt@vcs-inc.net)
Ms. Monika Kea, Highlands Diversified, Inc. (one pdf copy to mkea@alvaradogroup.net)

November 25, 2019

Project No. 19G-0600-0

Ms. Monika Kea
Highlands Diversified, Inc.
5114 East Clinton Way
Fresno, California 93727

**Subject: Geotechnical Investigation Report
New Subdivision
Southeast Corner of Kern Street and Corcoran Ave
APN 038-260-055
Avenal, California 93204**

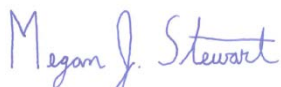
Dear Ms. Kea:

In accordance with your request, we have performed a geotechnical investigation for the subject project. This work was performed in accordance with Section 1803 of the 2016 California Building Code. The results of our geotechnical investigation are presented in the accompanying report, which includes a description of site conditions and potential geologic hazards, results of our field exploration and laboratory testing, conclusions, and recommendations.

We appreciate this opportunity to be of service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA GeoScience



Megan J. Stewart, GIT
Staff Geologist



Josue Montes, PE | GE
Principal Geotechnical Engineer
GE 2904



Distribution: Addressee (3 Originals and a pdf copy to mkea@alvaradogroup.net)

**GEOTECHNICAL INVESTIGATION REPORT
NEW SUBDIVISION
SOUTHEAST CORNER OF KERN STREET AND CORCORAN AVENUE
AVENAL, CALIFORNIA 93204**

for

Highlands Diversified, Inc.
5114 East Clinton Way
Fresno, California 93727

November 25, 2019

Project No. 19G-0600-0

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1.00 Introduction

1.01 Project Description

Based on our review of information provided in recent emails by you, which included a site plan, we understand that the project will consist of developing an 18.65-acre parcel with 122 lots. New construction will consist of one to two-story residential homes. It is assumed that the structures will be wood-framed, with a concrete slab-on-grade floor, and shallow reinforced-concrete foundations. Maximum wall and column loads (dead plus live, not including wind or seismic loads) are anticipated to be less than 2.0 kips per foot and 50 kips, respectively. Appurtenant improvements are anticipated to be various underground utilities, new concrete flatwork, new asphalt concrete roads and various street improvements, and landscaping.

1.02 Site Location and Description

The project site consists of an undeveloped property located at the southeast corner of Kern Street and Corcoran Avenue, as indicated on Figure 1, Site Vicinity Map. The tract is located south of the Arroyo del Camino Apartment complex within the southeast part of Avenal. Its approximate geographic position is 35.9990° north latitude and 120.1177° west longitude. At the time of our field investigation on November 9, 2019, the site appeared to have been recently cleared of hay or alfalfa (see pictures below). The general site topography was relatively flat, lower than street grade, thus anticipating fill using import soils. According to Google Earth, the elevation above mean sea level at the project site is approximately 782 to 796 feet, with a slight slope to the southwest. Aerial photos indicate the site has been vacant since at least 1958. Recently, the site has been used for cattle grazing.



Photo taken from B-10 looking northwest. Taken on November 9, 2019.

1.03 Purpose

A geotechnical investigation has been completed New Subdivision located at the southeast corner of Kern Street and Corcoran Avenue in Avenal, California. The purpose of the investigation was to summarize geotechnical and geologic conditions at the site, to assess their potential impact on the proposed development, and to develop geotechnical engineering design parameters.

1.04 Scope of the Investigation

The general scope of this investigation included the following:

- Review of published and unpublished geologic, seismic, groundwater and geotechnical literature.
- Examination of aerial photographs and topographic maps.
- Contacting of Underground Service Alert to locate onsite utility lines.
- Logging, sampling, and backfilling of 10 exploratory borings drilled with a CME-75 drill rig.
- Laboratory testing of representative soil samples.
- Geotechnical evaluation of the compiled data.
- Preparation of this report presenting our findings, conclusions and preliminary recommendations.

Our scope of work did not include a preliminary site assessment for the potential of hazardous materials onsite.

1.05 Investigation Methods and Limitation

Our investigation consisted of office research, field exploration, laboratory testing, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering and geologic principles and practices, and has incorporated applicable requirements of the California Building Code. Definitions of technical terms and symbols used in this report include those of the ASTM International, the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A presents a description of the methods and equipment used in performing the field exploration, as well as logs of our subsurface exploration. Appendix B presents a description of our laboratory testing and the test results. Finally, references are presented in Appendix C.

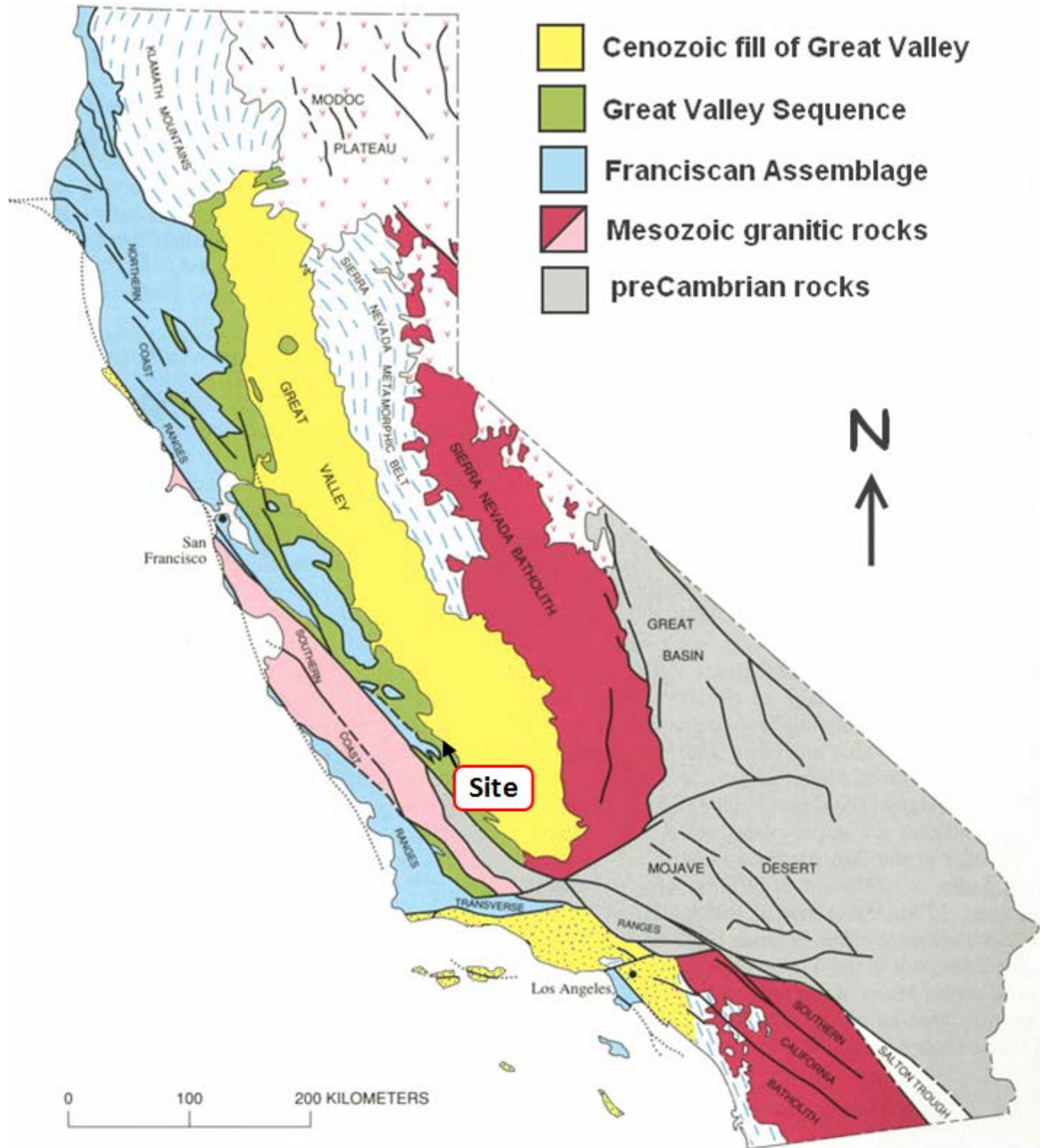
2.00 Findings

2.01 Geologic Setting

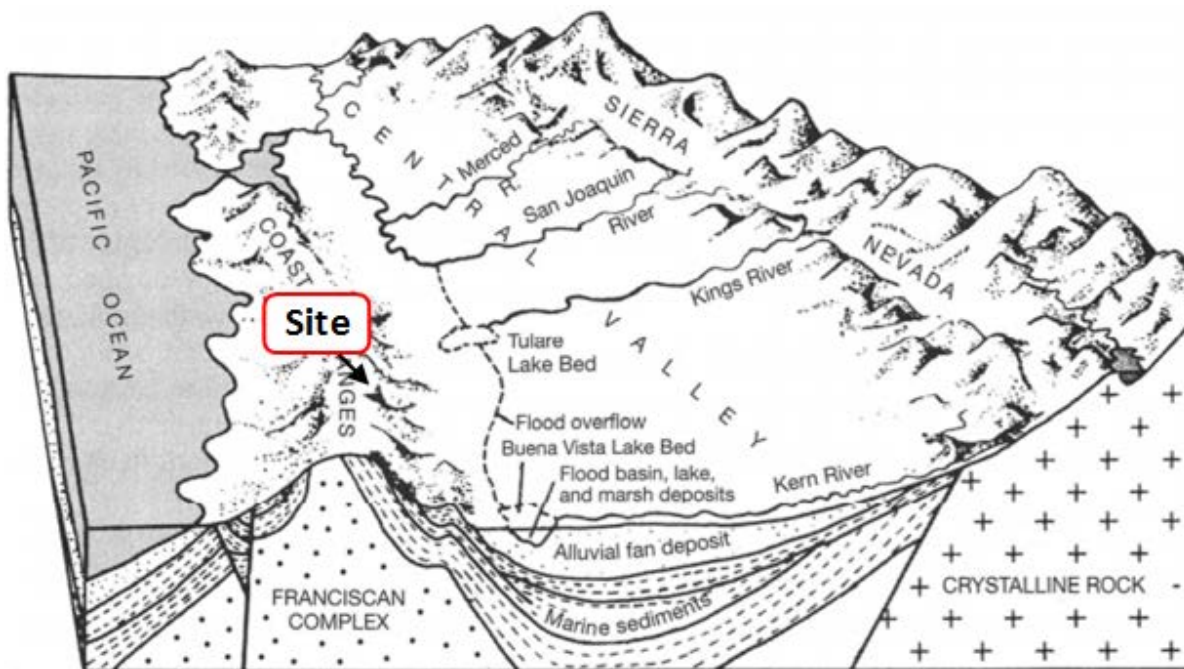
The subject site is located in the Kettleman Hills area, along the western margin of the San Joaquin Valley, which comprises the southern half of the Great Valley geomorphic province. The San Joaquin Valley is a westward-titling trough which forms a broad alluvial fan, approximately 200 miles long and 50 to 70 miles wide, where the eastern flank is broad and gently inclined, as opposed to the western flank which is relatively narrow (Bartow, 1991; Page, 1968). The Central Valley consists of the Great Valley Sequence, overlain by Cenozoic alluvium. Underlying the Great Valley Sequence are the Franciscan Assemblage to the west and the Sierra Nevada batholith to the east (Bailey, Irwin, and Jones, 1964).

The Franciscan Assemblage, made up of deformed and high pressure and low temperature metamorphosed mafic and ultramafic rocks, was formed around the Late Jurassic through the Miocene (160 to about 20 million years ago) by the offscraping of rocks from a subducting plate dipping to the east (Wakabayashi, 1992; Wakabayashi, 2010). The Great Valley Sequence is a 40,000 foot sequence of marine shale, sandstone, and conglomerate beds, deposited in a deep marine environment during the Late Jurassic through the Cretaceous (150 – 65 million years ago). Overlying the Great Valley Sequence is several thousand feet of Cenozoic alluvium, deposited by: streams and rivers draining from the mountains and creating alluvial fans; by lakes that covered parts of the valley floor from time to time; flooding; and marsh environments (Page, 1986). In some places, it is thousands of feet thick, and more than half of this thickness is composed of fine grained fluvial and lacustrine deposits. Holocene deposition consists mainly of episodic deposition of alluvial sediments (Bartow, 1991; Page, 1986).

The site is situated in a transition zone between the Central Valley to the east and the Coast Ranges to the west. Pleistocene-aged to recent alluvium and terrace deposits comprise the upper 100+ feet of the sediments on the valley floor. Along the eastern margins of the Coast Ranges, the Great Valley sequence is exposed (Wentworth & Zoback, 1990). The Tulare Formation, which is Pliocene to Holocene in age and consists of poorly-consolidated gravel, sand, and clay, with occasional indurated layers throughout, is exposed throughout the area (Arnold et. al, 1910). The Tulare Formation can be up to 4,000 feet thick in some areas. These sediments, derived from the Sierra Nevada to the east and the Coast Ranges to the west, have been deposited as alluvial fan, flood plain, deltaic, marsh, and lake deposits. Climatic change (such as the end of the last glacial maximum around 22,000 years ago) and uplift have affected the rates and types of deposition (Page, 1983). The project site is situated on a relatively shallow layer (less than 15 feet deep) of alluvium that is underlain by sedimentary rock associated with the Upper Tulare Formation.



Geologic map showing the locations of Cenozoic alluvium/fill (yellow) overlying the Great Valley Sequence (green), the Franciscan Assemblage (blue), and the Sierra Nevada Batholith (red). Modified from: Irwin (1990).



Geologic block diagram of California. From: Harden (2004). Not to scale.

2.02 Faults

The site is not located within the boundaries of an Earthquake Fault Zone for fault-rupture hazard as defined by the Alquist-Priolo Earthquake Fault Zoning Act and no faults are known to pass through the property. The nearest active earthquake fault zone (evidence of displacement within the past 11,700 years) are the San Andreas Fault Zone, the Nunez Fault, and the Pond Fault, located approximately 18 miles southwest, 23.5 miles northwest, and 50 miles southeast, respectively.

Our research of regional geologic and seismic data did not reveal any known instances of ground failure in the vicinity of the site associated with regional seismic activity. Seismic design parameters relative to the requirements of the 2016 California Building Code are presented in Section 3.02.

2.03 Earth Materials

The soil profile encountered during our field exploration indicated the subsurface soils at the project site primarily consisted of sandy clay that extend from the surface to depth of approximately 12 to 17 feet below ground surface underlain by silty sand, sandy silt, and relatively clean sand to the maximum depth explored of approximately 21 feet. The encountered fine grained soils generally had a relative consistency of stiff to very stiff, while granular soils generally had a relative consistency of medium dense. As indicated above, the soils encountered in the test borings are related to alluvial deposits that have been deposited in the central San Joaquin Valley over the past several thousand years.

The approximate locations of the test borings are presented on Figure 2. Logs of our exploratory test borings are presented in Appendix A, which provide more detailed information of the soils that were encountered to the maximum depths explored (21 feet) at the project site.

2.04 Expansive Soil

Our field exploration and laboratory tests indicate that the near surface soils have a medium expansion potential (Expansion Index of 59). Results of the laboratory tests test are presented in Appendix B.

2.05 Surface and Groundwater Conditions

No areas of ponding or standing water were present at the time of our study. Further, no springs or areas of natural seepage were observed at the project site. In addition, no groundwater was encountered in the test borings within the maximum depth explored of approximately 21 feet.

According to the Groundwater Information Center Interactive Map Application for spring 2018, the depth to groundwater in the vicinity of the project site is 220 feet. Historical data derived from wells (State Well IDs 22S17E26H001M and 22S17E34A001M) located 1.44 miles to the southeast and 1.45 miles south/southeast, respectively, of the project site indicates the depth to ground water on average was approximately 287 feet deep throughout the 1980's and then declined to a depth of approximately 295 during the 2000's. Over the subsequent years, the data indicates that the groundwater elevation has risen 75 feet.

3.00 Conclusions and Recommendations

3.01 General Conclusions

Based on specific data and information contained in this report, our understanding of the project, and our geotechnical engineering experience, it is our professional judgment that the proposed development is geologically and geotechnically feasible. Our review of geological literature and the field exploration performed for this project did not indicate any unusual conditions at the site that would entail special design considerations or construction procedures. Our field exploration and laboratory testing program indicate the soils have a medium expansion potential and the relative densities of the near-surface soils vary. Therefore, it will be important to perform some over-excavation, moisture conditioning, and re-compaction in the areas where building and other surface improvements are planned. Design provisions should be included in design for moisture control in order to mitigate potential expansion of soils. Specific geotechnical recommendations are presented below to address these soil conditions and provide information for other members of the design team to prepare the project plans and specifications for the planned construction.

3.02 Seismic Design Parameters

Seismic design parameters have been developed in accordance with Section 1613 of the 2016 California Building Code (CBC) using the online U.S. Geological Survey Seismic Design Maps Calculator (Version 3.1.0, ASCE 7-10 Standard) and a site location based on latitude and longitude. The calculator generates probabilistic and deterministic maximum considered earthquake spectral parameters represented by a 5-percent damped acceleration response spectrum having a 2-percent probability of exceedance in 50 years. The deterministic response accelerations are calculated as 150 percent of the largest median 5-percent damped spectral response acceleration computed on active faults within a region, where the deterministic values govern. The calculator does not, however, produce separate probabilistic and deterministic results. The parameters generated for the subject site are presented below:

2016 California Building Code (CBC) Seismic Parameters

Parameter	Value
Site Location (GPS Coordinates)	Latitude = 35.9990 degrees Longitude = -120.1177 degrees
Site Class	Site Class = D "Stiff Soil"
Mapped Spectral Accelerations	S_s (0.2-second period) = 1.829g S_1 (1-second period) = 0.636g
Site Coefficients (Site Class D)	F_a = 1.000 F_v = 1.500
Maximum Considered Earthquake Spectral Accelerations (Site Class D)	S_{MS} (0.2-second period) = 1.829g S_{M1} (1-second period) = 0.954g
Design Earthquake Spectral Accelerations (Site Class D)	S_{DS} (0.2-second period) = 1.219g S_{D1} (1-second period) = 0.636g

The above table shows that the mapped spectral response acceleration parameter for a 1-second period (S_1) is less than 0.75g and the spectral response acceleration parameters are $S_{DS} = 1.219g$ and $S_{D1} = 0.636g$. Therefore, the Seismic Design Category has been determined from Tables 1613.3.5(1) and 1613.3.5(2) is D for all Occupancy Categories (CBC Section 1613.5.6). Consequently, as required for Seismic Design Categories C through F by CBC Section 1803.5.11, slope instability, liquefaction, total and differential settlement, and surface displacement by faulting or seismically lateral spreading or lateral flow have been evaluated.

Peak earthquake ground acceleration adjusted for site class effects (PGA_M) has been determined in accordance with ASCE 7-10 Section 11.8.3 as follows: $PGA_M = F_{PGA} \times PGA = 1.00 \times 0.709 = 0.709g$.

3.03 Liquefaction and Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, and seismically induced settlement.

Liquefaction

Liquefaction is a phenomenon where earthquake-induced ground vibrations increase the pore pressure in saturated, granular soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of ground shaking. In order for liquefaction to occur, three criteria must be met: "low density", coarse-grained (sandy) soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large-magnitude earthquake. Since the depth to groundwater at the project site is much greater than 50 feet, in our opinion there is a negligible risk of liquefaction occurring at the project site during a design level seismic event.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large-magnitude earthquakes. When these waves

reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Tsunamis and seiches do not pose hazards due to the inland location of the site and lack of nearby bodies of standing water.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of underlying sediments. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Taking into account the consistency of the soils in the upper 21 feet, that the PGA_M is 0.709g, and the nearest active fault is approximately 18 miles from the project site, there is a relatively low risk of any significant seismic settlement occurring at the project site during a design level seismic event. For design purposes, it is estimated that the seismically induced settlement will be less than 1/4 inch during a design seismic event.

Seismically Induced Flooding

The site is not located within a low-lying area that would be inundated during the failure of an up gradient water reservoir or dam. Consequently, seismically induced flooding at the site is very unlikely.

3.04 Earthwork Recommendations

All earthwork construction should be performed in accordance with Appendix J of the 2016 California Building Code and all applicable governmental agency requirements. In the event of conflicts between this report and Appendix J, this report shall govern. It should be noted that all references to maximum dry density, optimum moisture content, and relative compaction are based on ASTM D 1557 laboratory test procedures.

All vegetation, organic rich soils (soils containing more than 2 percent organics by weight), trash, and debris should be cleared from the grading area and removed from the site. It is anticipated that the upper three to four inches of soil will need to be stripped in order to remove the organic rich materials from the building pad and paved areas of the site. Prior to performing the over-excavation recommended below, the stripped surface should be observed and approved by the Project Geotechnical Engineer. After the removal of deleterious materials and the stripping of organic-rich soils, the following over-excavation must be done within the area of the planned improvements:

- Within the area of the planned building improvements plus at least 5 feet horizontally beyond the perimeter of these improvements, the subgrade must be over-excavated at least 24 inches below the stripped subgrade surface or at least 12 inches below the bottom of footings, whichever is deeper. The upper 2 feet of soils below the finished subgrade should consist of import non-expansive soils.
- Outside of "building pad" area indicated above, and within the areas of planned asphalt pavement or concrete flatwork, the subgrade must be over-excavated at least 8 inches below the stripped surface or below the finished subgrade surface, whichever is lower.

Following the over-excavation indicated above, a designated representative for the Project Geotechnical Engineer must review the exposed ground surface prior to scarification and determine if any additional

over-excavation is required.

The over-excavated ground surface in all areas determined to be satisfactory for the support of fills must be scarified to a minimum depth of 8 inches. Scarification should continue until the soils are broken down and free from lumps or clods and until the scarified zone is uniform. The scarified zone should be uniformly moisture conditioned to at least optimum and compacted to at least 90 percent of the maximum dry density.

The upper 2 feet of soils below the finished subgrade should consist of non-expansive soils with an expansion index no greater than 20 and a plasticity index of no greater than 10. Removed and/or over-excavated on-site native soils free of organics and other deleterious material may be used as engineered fill below the upper 2 feet. Fill material should be placed in nearly horizontal layers, uniformly moisture conditioned to at least 3 percent over optimum moisture content for on-site soils, or, uniformly moisture conditioned to near optimum moisture content for granular soils, but not more than a moisture content that will not lend to achieving required compaction, and then compacted in layers that do not exceed approximately 6 inches in thickness. Thicker lifts may be placed if testing indicates the compaction procedures are such that the required compaction is being achieved and the geotechnical consultant approves their use. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to insure uniformity of material in each layer. Engineered fill must be compacted to achieve a relative compaction of at least 90 percent except for the upper 8 inches of subgrade below asphalt or concrete pavement sections subject to vehicular traffic, which must be compacted to at least 95 percent. A representative from RMA GeoScience must observe the placement of all fill material and perform tests to verify that the compaction of the fill material meets these requirements.

The above recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. Hence, over-excavation depths must be verified, and adjusted if necessary, at the time of grading. In addition, any contaminated or expansive soils within three (3) feet of the finished subgrade surface, must be removed and properly disposed of outside the area of the planned improvements.

3.05 Rippability and Rock Disposal

Our exploratory borings were advanced without difficulty and no oversize materials were encountered in our subsurface investigation. Accordingly, we expect that all earth materials will be rippable with conventional grading equipment and oversized materials are not expected.

3.06 Earthwork Shrinkage

Shrinkage is the decrease in volume of soil upon removal and recompaction, or scarifying and recompacting, expressed as a percentage of the original in-place volume. Based on our observations of the existing field conditions and lab testing data, a shrinkage factor in the range of approximately 10 to 15 percent is considered applicable for this project.

The degree to which fill soils are compacted and variations in the insitu density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to balance the earthwork.

3.07 Imported Fill Material

The onsite stockpile of soil and any imported fill materials that will be placed within building, pavement, or concrete flatwork areas must be non-hazardous and meet the following criteria:

Maximum Particle Size:	3 inches
Percent Passing 3/4 inch Sieve:	90% - 100%
Percent Passing #4 Sieve:	65% - 100%
Percent Passing #200 Sieve:	20% - 60%
Maximum Expansion Index:	20
Maximum Plasticity Index:	10
Organic Content:	<2 % by weight
Minimum R-value (in paved areas):	45
Soluble Sulfates < 1,000 mg/kg	
Soluble Chlorides < 200 mg/kg	
Minimum Soil Resistivity > 5,000 ohm-cm (unless other requirement established by the Design Engineer)	
pH in the range of 6.0 to 8.5	

3.08 Temporary Slopes and Shoring

Our geotechnical investigation indicates that excavations less than 5 feet in depth may generally be constructed with vertical sidewalls without shoring or shielding. Temporary excavations in existing alluvial soils that are deeper than 5 feet may be safely made at an inclination of 1:1 or flatter. If vertical sidewalls are required in excavations greater than 5 feet in depth, the use of cantilevered or braced shoring is recommended. The following geotechnical parameters can be used to design a shoring system:

Moist Unit Weight of Soils:	105 pcf
Angle of Internal Friction (ϕ):	30°
Cohesion:	125 psf

Unless vehicles, equipment, materials, etc., are kept a minimum distance equal to the height of the excavation away from the edge of the excavation, a surcharge load equal to a uniform lateral pressure of 70 psf should be assumed to act on the shoring in addition to the earth pressure calculated using the above geotechnical parameters.

Vehicles, equipment, materials, etc. should be set back a minimum distance of 10 feet from the top edge of sloped or vertical excavations. Surface waters should be diverted away from temporary excavations and prevented from draining over the top of the excavation and down the slope face. During periods of heavy rain, the slope face should be protected with sandbags to prevent drainage over the edge of the slope, and a plastic liner placed on the slope face to prevent erosion of the slope face.

Periodic observations of the excavations should be made by the geotechnical consultant to verify that the soil conditions have not varied from those anticipated and to monitor the overall condition of the temporary excavations over time. If at any time during construction conditions are encountered which differ from those anticipated, the geotechnical consultant should be contacted and allowed to analyze the field conditions prior to commencing work within the excavation.

Cal/OSHA construction safety orders should be observed during all underground work.

3.09 Utility Trench Backfill

The upper 5 feet of onsite soils will not be suitable for use as pipe bedding for buried utilities. All pipes should be bedded in sand or other suitable material as specified by the Project Civil Engineer. We recommend the bedding material have a Sand Equivalent (SE) of at least 30 and have less than 8 percent, by weight, passing the #200 Sieve. The geotechnical consultant should review and approve proposed bedding materials prior to use. Bedding materials should be compacted to at least 90% relative compaction (ASTM D1557) by mechanical methods.

The on-site soils are expected to be suitable as trench backfill provided they are screened of organic matter and other deleterious material. Trench backfill must be compacted consistent with the recommendations given above for engineered fill (see Section 3.04). Trench backfill should be compacted using mechanical methods; no jetting of backfill should be allowed. A minimum trench width of 24 inches or 18 inches plus the diameter of the utility line, whichever is greater, should be provided to permit uniform compaction on both sides of utility line and allow for a technician to perform in-place density tests using a nuclear gauge. If narrower trenches are desired, a sand-cement slurry should be used to backfill the trenches to within 8 inches of the top of trench. The sand-cement slurry should contain at least 2 sacks of cement per yard of mix and have a 4- to 6-inch slump. In addition, slurry should be consolidated using a suitable vibratory or mechanical method.

All utility trench backfill within street right of ways, utility easements, under or adjacent to sidewalks, driveways, or building pads should be observed and tested by the geotechnical consultant to verify proper compaction. Trenches excavated adjacent to foundations should not extend within the footing influence zone defined as the area within a line projected at a 1:1 drawn from the bottom edge of the footing. Trenches crossing perpendicular to foundations should be excavated and backfilled prior to the construction of the foundations. The excavations should be backfilled in the presence of the geotechnical engineer and tested to verify adequate compaction beneath the proposed footing. Where utility crossings are located within 12 inches of bottoms of footings, conduits should be wrapped with polystyrene foam or other suitable material with a minimum thickness of one inch. Conduits extending through footings shall be "sleeved" as determined by the Project Structural Engineer.

3.10 Lateral Soil Resistance

Lateral loads may be resisted by soil friction and the passive resistance of the soil. The following design parameters are recommended.

- Allowable Passive Earth Pressure = 200 pcf (equivalent fluid weight, includes a factor of safety = 2.0)
- Allowable Coefficient of Friction (soil to footing) = 0.25 (includes a factor of safety = 1.5)
- Retaining structures should be designed to resist a lateral active earth pressure of 40 pcf (equivalent fluid weight) for a level, non-expansive backfill with drainage provided.

The active earth pressure provided above is only applicable if the retained earth is allowed to strain sufficiently to achieve the active state. The required minimum horizontal strain to achieve the active state is approximately 0.0025H. Retaining structures should be designed to resist an at-rest lateral earth pressure of 55 pcf (equivalent fluid weight) if this horizontal strain cannot be achieved.

3.11 Foundations

Isolated spread footings and/or continuous wall footings are recommended to support the proposed residential buildings. Building foundations should be embedded at least 12 inches below the lowest adjacent grade. The foundations must be constructed on firm native soils or engineered fill as recommended in Section 3.04 of this report. Continuous and isolated spread footings with a minimum width of 12 and 24 inches, respectively, may be designed using an allowable bearing capacity of 2,000 pounds per square foot (psf). This allowable bearing capacity represents an allowable net increase in soil pressure over existing soil pressure and may be increased by one-third for short-term wind or seismic loads. The maximum expected settlement of footings designed with the recommended allowable bearing capacity is expected to be less than $\frac{3}{4}$ inch with a maximum differential settlement of $\frac{1}{2}$ inch between similarly sized and loaded footings or less than $\frac{1}{2}$ inch over a distance of 40 feet for continuous footings. Since the near-surface soils have a medium expansion potential, the reinforcement of building foundations should be based on structural considerations. However, it is recommended that continuous footings be reinforced with at least two #4 rebars, one located near the top, and one located near the bottom, of the footing.

It will be very important for all footing excavations to be observed by the geotechnical engineer to verify that they have been excavated into the recommended bearing material. Where zones of relatively loose or disturbed soils are present at the bottom of foundation recommendations, these soils should be properly compacted to provide a uniform bearing surface that meets the approval of the geotechnical engineer (refer to Section 3.04).

3.12 Pole Type Foundations

It is anticipated that light poles, signs, or canopies may be supported on pole-type foundations, drilled piers, or cast-in-drilled-hole (CIDH) piles. This type of foundation should be designed in accordance with Section 1807.3 of the 2016 CBC. However, it is recommended that an allowable lateral soil bearing pressure of 190 psf per foot of embedment be used to develop parameters S1 and S3 rather than one of the values given in Table 1806.2. This value includes a factor of safety of 2 and may be increased as indicated in Section 1806.3.4. In unpaved landscape areas, the upper 12 inches of soil should be ignored when calculating the minimum depth of embedment.

An allowable end bearing pressure of 3,000 psf (includes a factor of safety of 3.0) and an allowable average skin friction of 250 psf (includes a factor of safety of 2.0) may be used to support vertical loads applied to pier foundations that are embedded at least 5 feet. The end bearing should be ignored if the drilled pier excavation is not properly cleaned out prior to installing the reinforcing steel and placing concrete. The uplift capacity of drilled piers can be calculated using an allowable skin friction of 150 psf plus the weight of the pier. In unpaved landscape areas, the skin friction within the upper 12 inches of embedded length should be ignored. The total settlement of pier foundations designed in accordance with these recommendations should not exceed one-half inch.

Prior to placing reinforcing steel or concrete, loose or disturbed soils should be removed from drilled pier excavations. A representative of the Geotechnical Engineer should observe the drilling and clean-out associated with the construction of pier foundations in order to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report. Test borings indicate that thin interlayers of relatively clean sands may be encountered at depths of between 5 and 7 feet below the existing ground surface. Therefore, the contractor should be prepared to take measures to prevent caving or significant sloughing of CIDH sidewalls (such as installing a temporary casing) that extend more than 5 feet deep. In any case, reinforcing steel and concrete should be installed in an expeditious manner after each drilled hole is cleaned out. The contractor must take responsibility for staging the installation of CIDH piles so that significant amounts of sloughing or caving do not occur prior to installing the reinforcing steel and concrete.

3.13 Interior Slabs on Grade

Concrete floors with a minimum thickness of 4 inches are recommended for interior slabs on grade. Existing on-site soils within 5 feet of the ground surface may be considered to have a medium expansion potential for design purposes (Expansion Index of 51 - 90). However, to reduce the potential for excessive cracks as a result of differential movement, consideration should be given to reinforcing concrete slab-on-grade floors with at least #3 bars spaced 24 inches on-center in both directions. Reinforcement consisting of welded or woven wire mesh should not be used, due to the difficulty of keeping it centered in the slab during the construction process. If heavy concentrated or moving loads are anticipated, slabs should be designed using a modulus of subgrade reaction (k) of 100 pci. The concrete mix, reinforcement of slabs, and the location of construction and control joints should be specified by the Design Engineer.

A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. We recommend that design and construction of the moisture vapor retarder/barrier conform to Section 1805 of the 2016 California Building Code and pertinent sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

The moisture vapor retarder/barrier should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.3 in accordance with ASTM E 1745. The vapor barrier should be placed directly on a smooth compacted subgrade surface consistent with the recommendations provided in Section 3.02 of this report. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with

the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the moisture vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

The moisture vapor retarder/barrier may be placed directly beneath the floor slab with no intermediate granular fill layer. This method of construction will provide improved curing of the slab bottom and will eliminate potential problems caused by water being trapped in a granular fill layer. However, concrete slabs poured directly on a moisture vapor retarder/barrier can experience shrinkage cracking and curling due to differential rates of curing through the thickness of the slab. Therefore, for concrete placed directly on the moisture vapor retarder/barrier, we recommend a maximum water to cement ratio of 0.45 and the use of water-reducing admixtures to increase workability and decrease bleeding.

Alternatively, the slabs may be constructed over 2 inches of sand that is placed on the moisture vapor retarder/barrier in accordance with ACI 302.1R-04. Granular fill should consist of clean, fine-graded materials with 100% passing the No. 4 sieve, 10% to 30% passing the No. 100 sieve, and less than 5% passing the No. 200 sieve. The granular layer should be moist but not saturated and uniformly compacted by making at least one pass with a vibratory base compactor or some other mechanical method that is approved by the Project Geotechnical Engineer. The granular fill layer should not be left exposed to rain or other sources of water such as wet-grinding, power washing, pipe leaks or other processes, and should be damp but not saturated at the time of concrete placement. Granular fill layers that become saturated should be removed and replaced prior to concrete placement.

3.14 Miscellaneous Concrete Flatwork

Miscellaneous concrete flatwork and walkways may be designed with a minimum thickness of 4 inches. Large slabs should be reinforced with a minimum of #3 rebar spaced 24 inches on center in both directions placed at mid-height in the slab. Control joints should be constructed to create squares or rectangles with a maximum spacing of 12 feet. The Project Civil Engineer should provide design details and specifications for all exterior concrete flatwork including the concrete mix design, reinforcement, and the location of construction and control joints. We recommend walkways be separated from foundations with a thick expansion joint filler.

The subgrade soils beneath all miscellaneous concrete flatwork should be moisture conditioned and compacted as recommended in Section 3.04 of this report. The geotechnical engineer should monitor the moisture conditioning and compaction of the subgrade soils and perform testing to verify that the proper moisture content and compaction has been obtained. Prior to the placement of concrete, the moisture content of the upper 6 inches of subgrade should be at least optimum.

3.15 Footing Excavations and Concrete Subgrade

All footing excavations and bottom excavations should be observed by the geotechnical consultant to verify that they have been excavated into the recommended bearing material. The foundation excavations should be observed prior to the placement of forms, reinforcement steel, or concrete. These excavations should be evenly

trimmed and level. Prior to concrete placement, any loose or soft soils should be removed. Excavated soils should not be placed on slab or footing areas unless properly compacted.

Prior to the placement of the moisture barrier and sand, the subgrade soils underlying the slab should be observed by the geotechnical consultant to verify that all under-slab utility trenches have been properly backfilled and compacted, that no loose or soft soils are present, and that the slab subgrade has been properly moisture conditioned and compacted as recommended in Section 3.04 of this report.

Footings may experience an overall loss in bearing capacity or an increased potential to settle where located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by the footings on the utility lines may cause cracking, collapse and/or a loss of serviceability. To reduce this risk, footings should extend below a 1:1 plane projected upward from the closest bottom of the trench.

The upper 6 inches of subgrade underlying slabs-on-grade and walkways should have a moisture content at least optimum (see Section 3.04) prior to the placement of concrete or moisture barriers. The geotechnical consultant should perform insitu moisture tests to verify that the appropriate moisture content has been achieved within 72 hours prior to the placement of concrete or moisture barriers.

3.16 Drainage and Moisture Proofing

Surface drainage should be directed away from the proposed improvements into suitable drainage devices (see Section 1804.4 of the 2016 CBC). Neither excess irrigation nor rainwater should be allowed to collect or pond against building foundations or within low-lying or level areas of the property within 10 feet of buildings. Surface waters should be diverted away from the tops of slopes and prevented from draining over the top of slopes and down the slope face.

Walls and portions thereof that retain soil and enclose interior spaces and floors below grade should be waterproofed and damp-proofed in accordance with Section 1805 of the 2016 CBC.

Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls. Backdrains should be installed behind all retaining walls exceeding 3 feet in height. All backdrains should be outlet to suitable drainage devices. Retaining walls less than 3 feet in height should be provided with backdrains or weep holes. Damp-proofing and/or waterproofing should also be provided on all retaining walls exceeding 3 feet in height.

3.17 Cement Type and Corrosion Potential

Soluble sulfate tests performed on two shallow samples of soil indicated a soluble sulfate content in the range of 28.0 to 183.0 mg/kg (0.0028 to 0.0183 percent by weight). Thus, below-grade concrete at the subject site should have a negligible exposure to water-soluble sulfate in the soil. Our recommendations for concrete exposed to sulfate-containing soils are presented in the table below.

Recommendations for Concrete Exposed to Sulfate Containing Soils

Sulfate Exposure	Water Soluble Sulfate (SO ₄) in Soil (% by Weight)	Sulfate (SO ₄) in Water (ppm)	Cement Type (ASTM C150)	Maximum Water-Cement Ratio (by Weight)	Minimum Compressive Strength (psi)
Negligible	0.00 - 0.10	0-150	--	--	2,500
Moderate	0.10 - 0.20	150-1,500	II	0.50	4,000
Severe	0.20 - 2.00	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00	Over 10,000	V plus pozzolan or slag	0.45	4,500

Use of alternate combinations of cementitious materials may be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.

Our testing also indicates that there is a low soluble chloride content (14.9 to 27.0 mg/kg) in the onsite soils. Therefore, no special protection of reinforcing steel should be required due to soil conditions.

The soils were also tested for minimum electrical resistivity (ohm-cm). The test results indicate that the on-site soils have a pH in the range 8.83 and 8.85 and a minimum electrical resistivity of 810 ohm-cm. A neutral or non-corrosive soil has a pH value ranging from approximately 6 to 8.5; therefore, the onsite soils can be considered slightly basic. Generally, soils that could be considered moderately corrosive to ferrous metals have minimum resistivity values of about 3,000 ohm-cm to 10,000 ohm-cm. Soils with minimum resistivity values less than 3,000 ohm-cm can be considered corrosive and soils with minimum resistivity values less than 1,000 ohm-cm can be considered extremely corrosive. In any case, buried metal conduits should have a protective coating in accordance with the manufacturer's specifications. A corrosion specialist should be consulted if more detailed recommendations are required.

3.18 Pavement Sections

Current plans indicate that site improvements will include constructing new asphalt concrete (AC) driveways and parking areas. A Traffic Index (TI) in the range of 5.0 to 6.0 is expected to be applicable for the traffic conditions at the project site. These traffic design assumptions should be reviewed for compatibility with the actual development, and revised pavement sections developed, as necessary. Based on the laboratory testing that has been performed (see Figures B9 through B11 in Appendix B), a subgrade R-value of 9 is considered applicable for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤ 5.0	2.5" AC over 10.0" Class 2 AB
5.5	3.0" AC over 11.0" Class 2 AB
6.0	3.0" AC over 13.0" Class 2 AB

Prior to paving, the subgrade should be prepared in accordance with Section 3.04 of this report. At a minimum, the upper 8 inches of subgrade soils should be compacted to at least 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

3.19 Pregrading Meeting

Prior to the start of grading, a meeting should be held with the General Contractor, the Earthwork Contractor, the Project Civil Engineer, the Project Geotechnical Engineer, the Project Manager, and any other pertinent members of the project team to discuss the grading requirements contained in this report and in the project grading plans. This meeting will help ensure that the grading requirements have been properly interpreted by the contractor and allow for any concerns to be discussed prior to breaking ground. In addition, project scheduling and the coordination of testing and inspection services should be discussed.

3.20 Plan Review

Once formal grading and foundation plans are prepared for the subject project, this office should review the plans from a geotechnical viewpoint, comment on changes from the plan used during preparation of this report and revise the recommendations of this report where necessary.

3.21 Geotechnical Observation and Testing During and After Grading

The geotechnical engineer should be contacted to provide observation and testing during the following stages of grading:

- During the clearing and grubbing of the site.
- During the demolition of any existing structures, buried utilities or other existing improvements.
- During excavation and over-excavation of existing subgrade.
- During all phases of grading including ground preparation and filling operations.
- When any unusual conditions are encountered during grading.

A grading and compaction report summarizing conditions encountered during grading and the in-place density testing that was performed should be submitted upon completion of the earthwork construction.

After the completion of grading, the geotechnical engineer should be contacted to provide additional observation and testing during the following construction activities:

- During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
- After excavation and prior to placement of reinforcing steel or concrete within footing excavations to verify that footings are properly founded in competent materials.
- During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
- When any unusual ground or soil conditions are encountered during construction.

4.0 Closure

The findings, conclusions and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for Highland Diversified, Inc. to be used for the design and construction of the planned improvements as described above and at the location indicated on Figures 1 and 2. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

The geotechnical engineering consultant should be retained during any future earthwork and foundation phases of construction to monitor compliance with the design concepts and recommendations and to provide additional recommendations as needed. Should subsurface conditions be encountered during construction that are different from those described in this report, this office should be notified immediately so that our recommendations may be re-evaluated.

FIGURES



FIGURE 1

SITE VICINITY MAP

New Subdivision

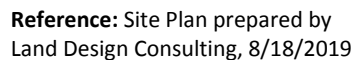
Southeast Corner of Kern Street

and Corcoran Avenue

Avenal, California 93204

Project #19G-0600-0

Scale: 1" ≈ 1,050'



Scale: 1" \approx 135'

New Subdivision

Southeast Corner of Kern Street
and Corcoran Avenue
Avenal, California 93204
Project #19G-0600-0

B-2 Approximate Boring Location



APPENDIX A

FIELD INVESTIGATION

APPENDIX A

FIELD INVESTIGATION

A-1.00 FIELD EXPLORATION

A-1.01 Number of Borings

Our subsurface investigation consisted of excavating ten test borings to a maximum depth of 21 feet below existing grade with a CME 75 drill rig equipped with a 7-inch hollow stem auger and a 140-pound auto-hammer. The borings were performed on November 9, 2019.

A-1.02 Location of Borings

A map showing the approximate locations of the test borings is presented as Figure 2. GPS coordinates indicated on the logs are based on information provided by Theodolite Version 8.0 run on an iPhone 11 Pro Max with iOS Version 13.2.

A-1.03 Boring Logging

Logs of the borings were prepared by our staff and are attached in this appendix. The logs contain factual information and interpretation of subsurface conditions between samples. The strata indicated on these logs represent the approximate boundary between earth units and the transition may be gradual. The logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times.

Identification of the soils encountered during the subsurface exploration was made using the field identification procedure of the Unified Soils Classification System (ASTM D2488). A legend defining the terms used in describing the relative compaction, consistency or firmness of the soil is included in this appendix. Bag or tube samples of the major earth units were obtained for laboratory inspection and testing.

I. SOIL STRENGTH/DENSITY

BASED ON STANDARD PENETRATION TESTS

Compactness of sand		Consistency of clay	
Penetration Resistance N (blows/Ft)	Compactness	Penetration Resistance N (blows/ft)	Consistency
0-4	Very Loose	<2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
>50	Very Dense	15-30	Very Stiff
		>30	Hard

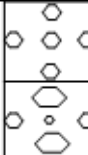

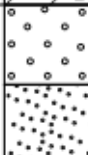



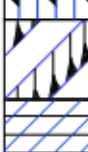

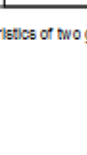



N = Number of blows of 140 lb. weight falling 30 in. to drive 2-in OD sampler 1 ft.

BASED ON RELATIVE COMPACTION

Compactness of sand		Consistency of clay	
% Compaction	Compactness	% Compaction	Consistency
<75	Loose	<80	Soft
75-83	Medium Dense	80-85	Medium Stiff
83-90	Dense	85-90	Stiff
>90	Very Dense	>90	Very Stiff

II. SOIL MOISTURE

Moisture of sands		Moisture of clays	
% Moisture	Description	% Moisture	Description
<5%	Dry	<12%	Dry
5-12%	Moist	12-20%	Moist
>12%	Very Moist	>20%	Very Moist, wet

PARTICLE SIZE LIMITS										
BOULDERS		COBBLES		GRAVEL		SAND		SILT OR CLAY		
				COARSE	FINE	COARSE	MEDIUM	FINE		
12 in.		3 in.		3/16 in.		No. 40		No. 200		
U.S. STANDARD SIEVE SIZE										
MAJOR DIVISIONS				GROUP SYMBOLS		TYPICAL NAMES				
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)				GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)		CLEAN GRAVELS (Little or no fines)			GW	Well graded gravel, gravel-sand mixtures, little or no fines.
						GRAVELS WITH FINES (Appreciable amt. of fines)			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
				SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)		CLEAN SANDS (Little or no fines)			SW	Well graded sands, gravelly sands, little or no fines.
						SANDS WITH FINES (Appreciable amount of fines)			SP	Poorly graded sands or gravelly sands, little or no fines.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)				SILTS AND CLAYS (Liquid limit LESS than 50)		SM			SM	Silty sands, sand-silt mixtures.
						SC			SC	Clayey sands, sand-clay mixtures.
						ML			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
						CL			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				SILTS AND CLAYS (Liquid limit GREATER than 50)		OL			OL	Organic silts and organic silty clays of low plasticity.
						MH			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
						CH			CH	Inorganic clays of high plasticity, fat clays.
						OH			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS							Pt	Peat and other highly organic soils.		

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

Exploratory Boring Log

Boring No. B-1

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



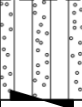
Borehole Diameter: 4"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 36.000569°, -120.119212°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	R	28		11.3	101.9	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff
	R	17		11.2	92.7			...with interlayers of fine SAND
								...yellow brown
10	R	26		14.5	106.6			...increasing CLAY content, with caliche
15	S	11				SM		...medium stiff
20	S	8						Brown, fine to medium SILTY SAND with CLAY, moist, medium dense
25								Notes: 1. Boring terminated at 21' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

-  - SPT Sample
  - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

-  - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-2

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS






Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.999323°, -120.119245°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5		26		10.2	99.9	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff, with caliche
7		7						...medium stiff
10								Notes: 1. Boring terminated at 6' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
15								
20								
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

 - SPT Sample
  - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-3

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.999661°, -120.117251°


Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	[R]	26		10.8	90.8	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff
	[R]	25		11.1	89.5			...increasing CLAY content
10	[S]	11						...moist, stiff, with caliche
15	[S]	14						
20								Notes: 1. Boring terminated at 16' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

[S] - SPT Sample  - Bulk Sample
[T] - Modified California Tube Sample
[R] - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-4

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



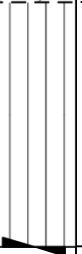

Borehole Diameter: 4"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.999709°, -120.115661°


Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	[R]	19		8.2	94.5	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff
	[R]	27		9.2	86.4			...with interlayers of fine SAND
10	[R]	26		9.2	98.5			...brown, increasing CLAY content
15	[S]	6				ML		Brown, fine SANDY SILT, moist, medium stiff
20	[S]	9						...stiff
25								Notes: 1. Boring terminated at 21' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

[S] - SPT Sample  - Bulk Sample
[T] - Modified California Tube Sample
[R] - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-5

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.999061°, -120.115918°

Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	<div style="border: 1px solid black; padding: 2px;">R</div>	17	<div style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"></div>	6.9	100.7	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff
5	<div style="border: 1px solid black; padding: 2px;">S</div>	3						...soft
10								Notes: 1. Boring terminated at 6' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
15								
20								
25								
30								
35								

***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

S

 - SPT Sample - Bulk Sample



T

 - Modified California Tube Sample

R

 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-6

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



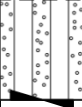
Borehole Diameter: 4"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.999136°, -120.116518°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	R	16		9.6	90.9	CL		ALLUVIUM: light brown, fine SANDY CLAY, dry, very stiff
	R	46		12.7	100.7			...brown, increasing CLAY content, moist, hard, with caliche
10	R	17		14.1	98.2			...very stiff
15	S	13						...stiff
20	S	8				SM		Brown, fine to medium SILTY SAND with CLAY, moist, medium dense
25								Notes: 1. Boring terminated at 21' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

 - SPT Sample
 - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-7

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS



Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.998921°, -120.119549°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	R	13		11.4	92.6	CL		ALLUVIUM: yellow brown, fine SANDY CLAY, dry, stiff, with caliche
	R	23		10.4	91.9			...very stiff
10	S	11						...moist, stiff
15	S	14						...increasing CLAY content
20								Notes: 1. Boring terminated at 16' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

 - SPT Sample
 - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-8

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS




Borehole Diameter: 4"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 35.998381°, -120.119067°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	R	14		11.1	95.9	CL		ALLUVIUM: yellow brown, fine SANDY CLAY, dry, stiff, with caliche
	R	17		12.8	100.0			...with interlayers of fine SAND, very stiff
10	R	20		13.1	107.9			...increasing CLAY content
15	S	16						...stiff
20	S	14						Notes: 1. Boring terminated at 21' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

 - SPT Sample
 - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-9

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS






Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 36.001264°, -120.118887°





Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5		14		10.3	96.7	CL		ALLUVIUM: yellow brown, fine SANDY CLAY, dry, stiff
7		7						...medium stiff, with caliche
10								Notes: 1. Boring terminated at 6' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
15								
20								
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

 - SPT Sample
 - Bulk Sample
 - Modified California Tube Sample
 - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

Exploratory Boring Log

Boring No. B-10

Sheet 1 of 1

Date Drilled: November 9th, 2019

Drilling Equipment: CME 75, Hollow Stem Auger

Logged By: MJS






Borehole Diameter: 7"

Location: See Boring Location Map

Drive Weights: 140 lbs. (Autohammer)

Geographic Position: 36.001854°, -120.118211°

Drop Height: 30"

Depth (ft)	Samples			Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	Sample Type	Blows (blows/ft)	Bulk Sample					
5	[R]	18		6.8	103.9	SC		ALLUVIUM: yellow brown, fine CLAYEY SAND, moist, medium dense
	[R]	11		4.7	95.0			...light brown, with interlayers of fine SAND, dry
10	[S]	13				CL		Light brown, fine SANDY CLAY, moist, stiff, with caliche
15	[S]	6				SP		Brown, fine SAND with SILT, moist, loose
20								Notes: 1. Boring terminated at 16' 2. No Groundwater Encountered 3. Boring backfilled with soil cuttings
25								
30								
35								



***Note**

All blow counts associated with Modified California Sample are uncorrected. The sampler dimensions are as follows:
ID = 2.5" OD = 3"

Sample Types:

[S] - SPT Sample [] - Bulk Sample
[T] - Modified California Tube Sample
[R] - Modified California Ring Sample

Symbols:

 - Groundwater
 - End of Boring

APPENDIX B

LABORATORY TESTS

APPENDIX B

B-1.00 LABORATORY TESTS

B-1.01 Moisture Determination

The moisture content of tube and ring samples obtained from the test boring was determined in accordance with ASTM D2216, the standard method for determining the water content of soil using a drying oven. The mass of material remaining after oven drying is used as the mass of the solid particles. The results of these tests are provided on the boring logs in Appendix A.

B-1.02 Density of Tube Samples

The densities of tube and ring samples, which were obtained using a split-barrel sampler, were determined in accordance with ASTM D2937. The results of these tests are provided on the boring logs in Appendix A.

B-1.03 Soluble Sulfates and Chlorides

Tests were performed in accordance with California Test Methods 417 and 422 on two near-surface soil samples obtained during the field exploration. These tests were performed by Dellavalle Laboratory, Inc. located in Fresno, California (see Table B1 for results).

B-1.04 Soil Reactivity (pH) and Minimum Electrical Resistivity

Two near-surface soil samples were tested for soil reactivity (pH) and minimum electrical resistivity using California Test Method 643 (see Table B1). The pH measurement determines the degree of acidity or alkalinity in the soils. The minimum electrical resistivity is used as an indicator of how corrosive the soil is relative to buried metallic items.

TABLE B1: SUMMARY OF CORROSIVITY TEST RESULTS

Sample Location	Soluble Sulfates (mg/kg)	Soluble Chlorides (mg/kg)	pH	Minimum Resistivity (ohm-cm)
B-3 @ 1' - 3'	28.0	27.0	8.85	810
B-8 @ 1' - 3'	183.0	14.9	8.83	810

B-1.05 Percent Passing #200 Sieve

Three soil samples were tested in accordance with ASTM D1140 to determine the percent passing the #200 sieve (see Table B2). This represents the amount of silt and clay that is present in the soil.

TABLE B2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
B-3 @ 1' - 3'	271.2	59.5	78
B-7 @ 1' - 3'	272.3	73.8	73
B-10 @ 1' - 3'	285.2	169.8	40

B-1.06 Atterberg Limits

The liquid limit, plastic limit, and the plasticity index of three near-surface soil samples were determined using the standard test methods of ASTM D4318 (See Figures B1 through B3).

B-1.07 Expansion Index

Expansion index testing was performed on a near-surface sample of the on-site soils in accordance with the standard test methods of ASTM D4829. The results of this test are shown on Figure B4.

B-1.08 Direct Shear

Two 3-point direct shear tests were performed on representative near-surface samples of soil using the standard test method of ASTM D3080 (consolidated and drained). Shear tests were performed on a direct shear machine of the strain-controlled type by Salem Engineering Group, Inc. To simulate possible adverse field conditions, the samples were saturated prior to shearing. Three soil specimens were sheared at varying normal loads for the test and the results plotted to establish the angle of the internal friction and cohesion of the tested samples. The results of these tests are shown on Figures B5 and B6.

B-1.09 One-Dimensional Consolidation Properties

The magnitude and rate of consolidation of soils obtained from test borings, when it is restrained laterally and drained axially while subjected to incrementally applied controlled-stress loading, was determined using the standard test methods of ASTM D2435 (See Table B3). The results of these tests are shown on Figures B7 and B8.

B-1.10 Resistance Value

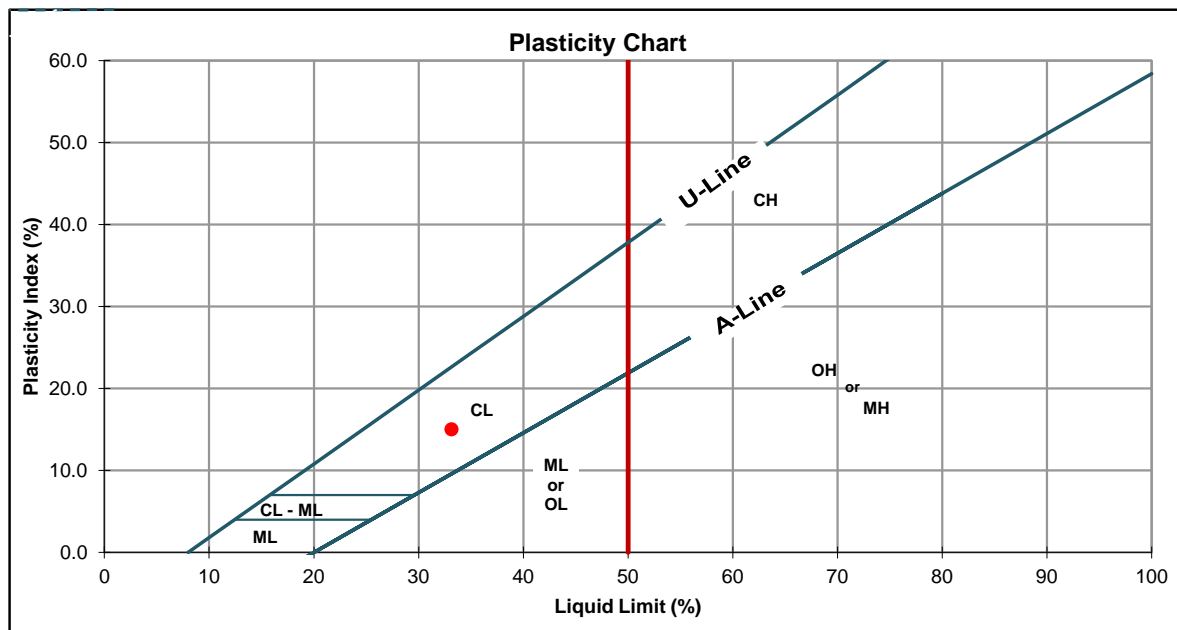
Three Resistance Value (R-value) tests were performed on representative samples of subgrade obtained from the planned paved areas using test methods outlined in ASTM D2844 (see Figures B9 through B11).

Figure B1
Laboratory Test Form | ASTM D4318
Plasticity Index (PI) of Soils

Project Number:	19G-0600-0/02	Lab ID:	19-003338
Project Name:	New Subdivision	Date Tested:	11/12/2019
Sampled By:	Megan S.	Tested By:	Bryce M.
Sample Date:	11/9/2019		
Sample Location:	B-4 @ 1' - 3'		
Sample Description:	Sandy CLAY, fine grained, brown		

Plasticity Index Results

Average Liquid Limit:	33
Average Plastic Limit :	18
Plasticity Index:	15



Liquid Limit Data

	Trial 1	Trial 2	Trial 3
Wet Weight (gm.)	42.95	41.83	41.82
Dry Weight (gm.)	40.71	39.76	39.75
Tare Weight (gm.)	33.78	33.51	33.65
Number of Blows	33	24	20
Liquid Limit	32.3	33.1	33.9
Corrected Liquid Limit	33.4	33.0	33.0

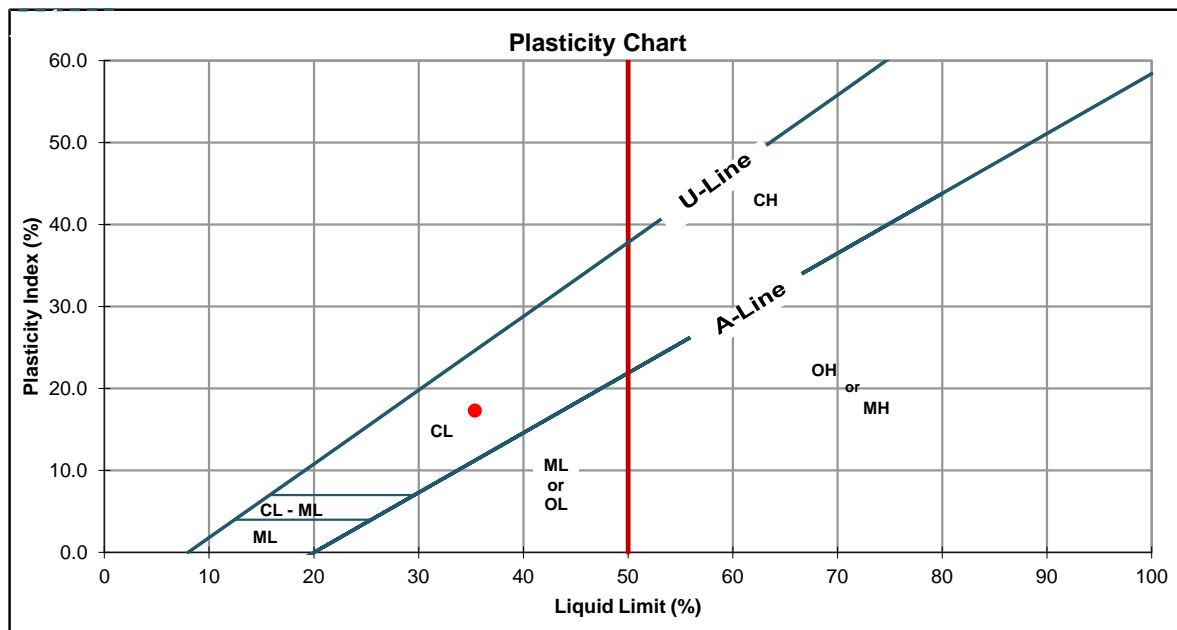
Plastic Limit Data

	Trial 1	Trial 2
Wet Weight (gm.)	38.27	38.94
Dry Weight (gm.)	36.76	37.32
Tare Weight (gm.)	28.41	28.39
Moisture Content (%)	18.1	18.1

Project Number:	19G-0600-0/02	Lab ID:	19-003344
Project Name:	New Subdivision	Date Tested:	11/12/2019
Sampled By:	Megan S.	Tested By:	Bryce M.
Sample Date:	11/9/2019		
Sample Location:	B-6 @ 1' - 3'		
Sample Description:	Sandy CLAY, fine grained, brown		

Plasticity Index Results

Average Liquid Limit:	35
Average Plastic Limit :	18
Plasticity Index:	17



Liquid Limit Data

	Trial 1	Trial 2	Trial 3
Wet Weight (gm.)	36.74	35.68	37.24
Dry Weight (gm.)	34.62	33.81	34.85
Tare Weight (gm.)	28.29	28.42	28.30
Number of Blows	32	30	23
Liquid Limit	33.5	34.7	36.5
Corrected Liquid Limit	34.5	35.5	36.1

Plastic Limit Data

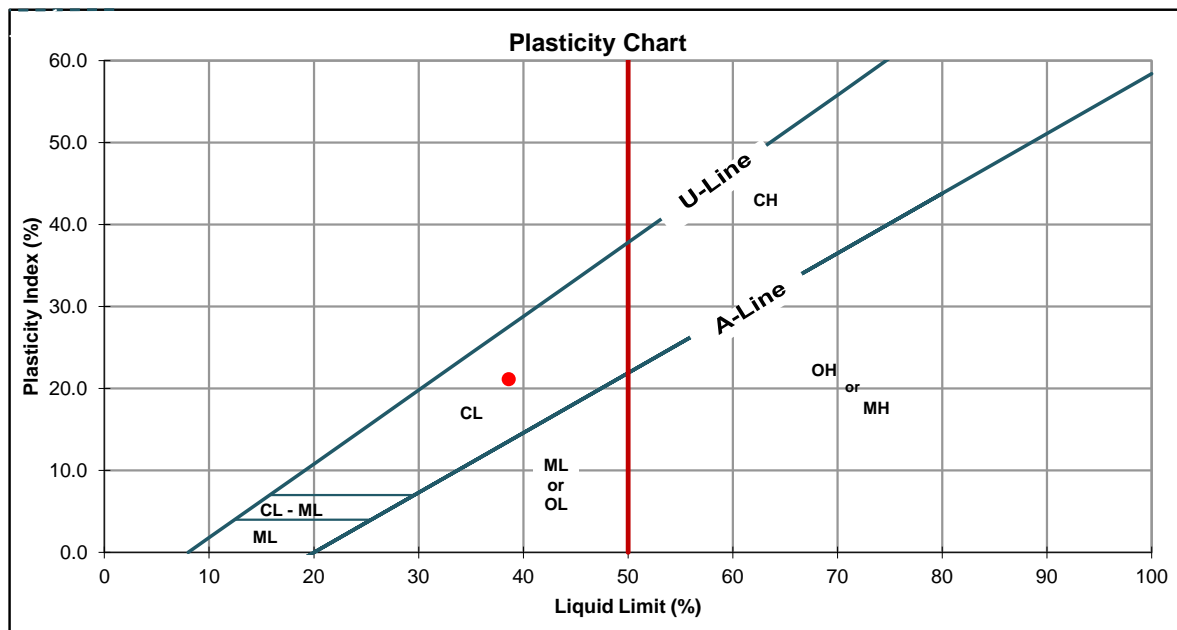
	Trial 1	Trial 2
Wet Weight (gm.)	44.61	38.13
Dry Weight (gm.)	42.93	36.69
Tare Weight (gm.)	33.86	28.50
Moisture Content (%)	18.5	17.6

Figure B3
Laboratory Test Form | ASTM D4318
Plasticity Index (PI) of Soils

Project Number:	19G-0600-0/02	Lab ID:	19-003351
Project Name:	New Subdivision	Date Tested:	11/12/2019
Sampled By:	Megan S.	Tested By:	Bryce M.
Sample Date:	11/9/2019		
Sample Location:	B-8 @ 1' - 3'		
Sample Description:	Sandy CLAY, fine grained, brown		

Plasticity Index Results

Average Liquid Limit:	39
Average Plastic Limit :	17
Plasticity Index:	21



Liquid Limit Data

	Trial 1	Trial 2	Trial 3
Wet Weight (gm.)	37.95	37.56	36.27
Dry Weight (gm.)	35.31	35.00	34.00
Tare Weight (gm.)	28.47	28.53	28.36
Number of Blows	30	20	15
Liquid Limit	38.6	39.6	40.2
Corrected Liquid Limit	39.5	38.5	37.8

Plastic Limit Data

	Trial 1	Trial 2
Wet Weight (gm.)	37.52	45.83
Dry Weight (gm.)	36.12	44.08
Tare Weight (gm.)	28.15	34.00
Moisture Content (%)	17.6	17.4

Figure B4
Laboratory Test Form | ASTM D4829
Expansion Index of Soils

Project Number: 19G-0600-0/02 Lab ID: 19-003329
Project Name: New Subdivision Date Sampled: 11/9/2019
Sampled By: Megan S. Date Tested: 11/19/2019
Tested By: Ryan R.
Sample Location: B-1 @ 1' - 3'
Sample Description: SANDY CLAY, fine to medium grained, brown

Expansion Readings

Initial Sample Height (in): 1.0000
Final Sample Height (in): 1.0595
Expansion (in): 0.0595

Expansion Index, EI: 59

Classification of Expansive Soil

EI	Potential Expansion
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Expansion Index Data

Initial Set-Up Data	Final Data
Sample + Tare Weight (gm): <u>735.9</u>	Sample + Tare Weight (gm): <u>790.5</u>
Tare Weight (gm): <u>365.6</u>	Tare Weight (gm): <u>365.6</u>
Initial Gauge Reading (in): <u>0.0000</u>	Final Gauge Reading (in): <u>0.0595</u>

Moisture Content And Density Data

Wet Weight + Tare (gm): <u>100.0</u>	Wet Weight + Tare (gm): <u>790.5</u>
Dry Weight + Tare (gm): <u>88.9</u>	Dry Weight + Tare (gm): <u>694.8</u>
Tare Weight (gm): <u>0</u>	Tare Weight (gm): <u>365.6</u>
Moisture Content: <u>12.5%</u>	Moisture Content: <u>29.1%</u>
Initial Volume (ft ³): <u>0.007345</u>	Final Volume (ft ³): <u>0.007705</u>
Remolded Wet Density (pcf): <u>111.1</u>	Final Wet Density (pcf): <u>121.6</u>
Remolded Dry Density (pcf): <u>98.8</u>	Final Dry Density (pcf): <u>94.2</u>
Degree of Saturation: <u>48</u>	Assumed Specific Gravity: <u>2.7</u>

Figure B5 Direct Shear Test (ASTM D3080)

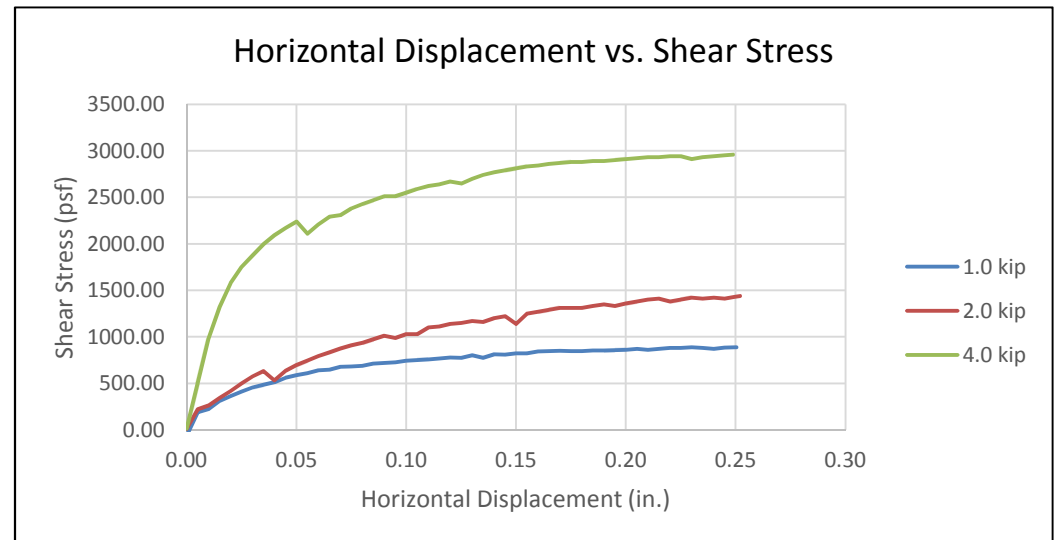
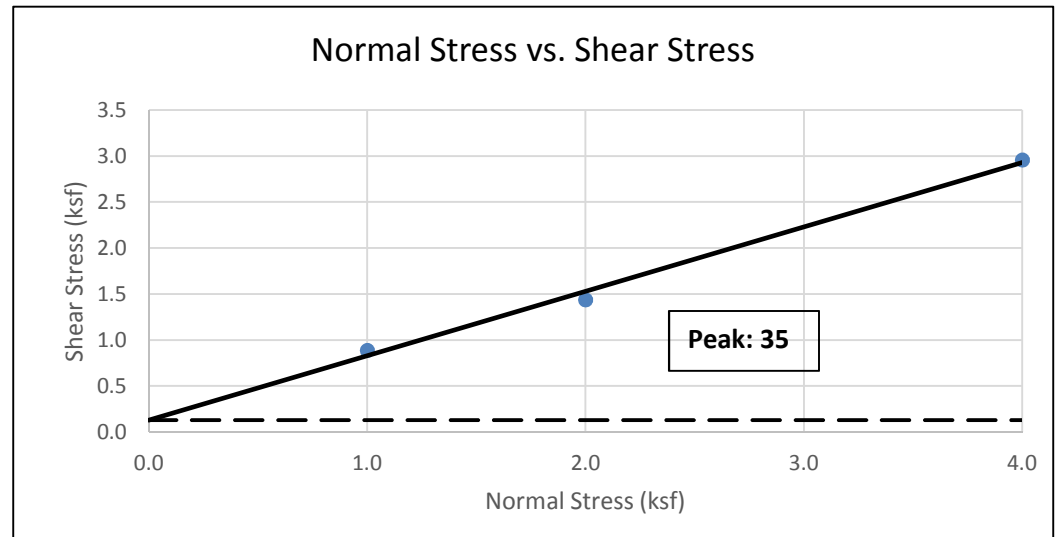
Project Name: New Subdivision
 Project Number: 19G-0600-0/02
 Client: RMA GeoScience
 Boring: B-1 @ 5.5'
 Soil Type: CL
 Sample Type: Undisturbed Ring
 Tested By: NL
 Reviewed By: JRM
 Date of Test: 11/18/19
 Test Equipment: GeoComp ShearTrac II

	Loading		
	1.0 kip	2.0 kip	4.0 kip
Normal Stress (ksf)	1.00	2.00	4.00
Shear Rate (in/min)	0.0025	0.0025	0.0025
Peak Shear Stress (ksf)	0.89	1.44	2.96
Residual Shear Stress (ksf)	0.00	0.00	0.00

Initial Height of Sample (in)	1.000	1.000	1.000
Post-Consol. Sample Height (in.)	0.805	0.811	0.607
Post-Shear Sample Height (in.)	0.777	0.774	0.576
Diameter of Sample (in)	2.416	2.416	2.416

Initial (pre-shear) Values			
Moisture Content (%)	11.2		
Dry Density (pcf)	89.8	89.9	91.9
Saturation %	34.1	34.2	35.9
Void Ratio	0.89	0.89	0.85
Consolidated Void Ratio	0.52	0.53	0.12

Final (post-shear) Values			
Final Moisture Content (%)	30.8	21.5	27.0
Dry Density (pcf)	98.4	113.4	129.7
Saturation %	115.1	97.9	341.7
Void Ratio	0.73	0.60	0.22



Peak Shear Strength Values		Residual Shear Strength Values	
Slope	0.70	Slope	0.00
Friction Angle	35	Friction Angle	0
Cohesion (psf)	129	Cohesion (psf)	0

Figure B6 Direct Shear Test (ASTM D3080)

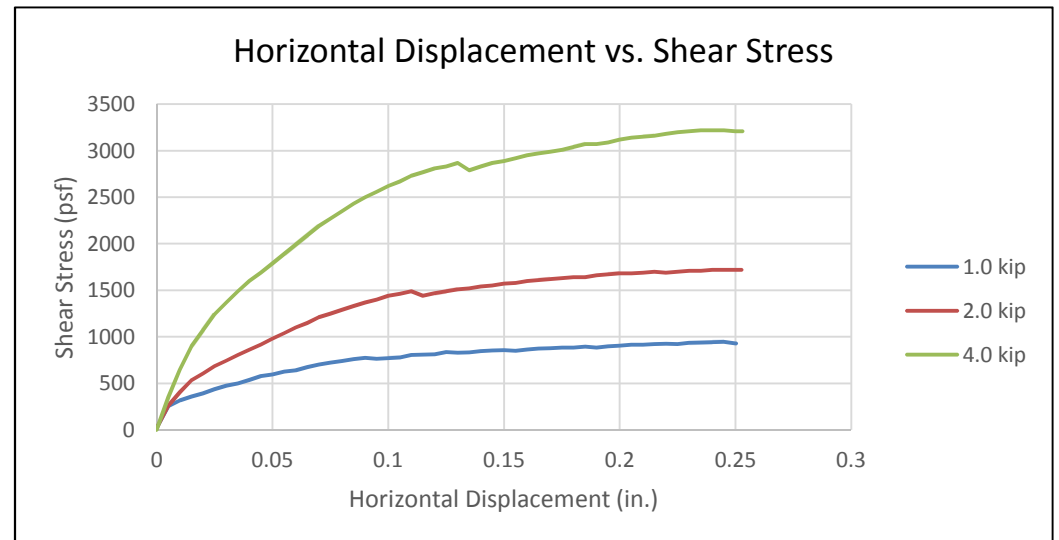
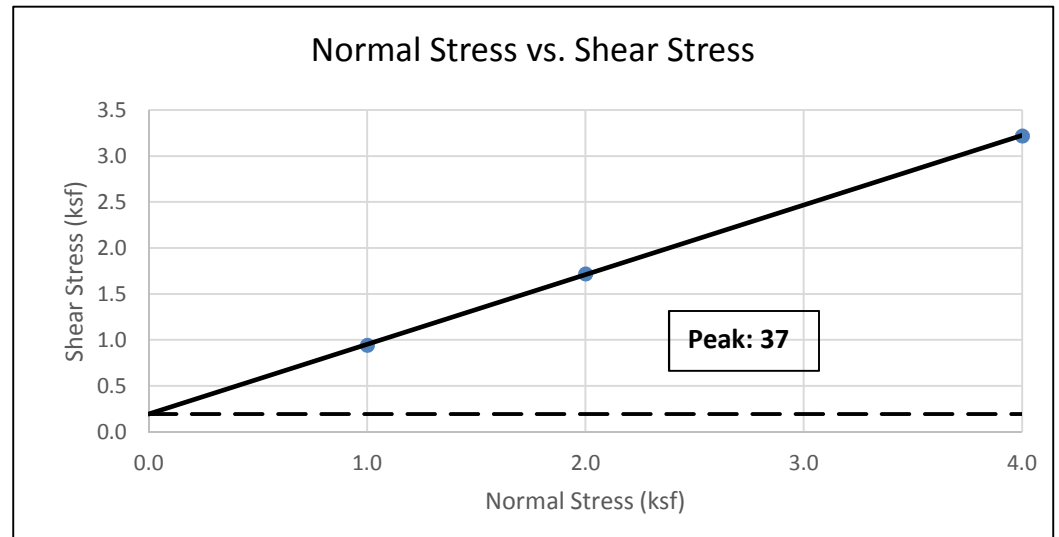
Project Name: New Subdivision
 Project Number: 19G-0600-0/02
 Client: RMA GeoScience
 Boring: B-10 @ 5.5'
 Soil Type: CL
 Sample Type: Undisturbed Ring
 Tested By: NL
 Reviewed By: JRM
 Date of Test: 11/20/19
 Test Equipment: GeoComp ShearTrac II

	Loading		
	1.0 kip	2.0 kip	4.0 kip
Normal Stress (ksf)	1.00	2.00	4.00
Shear Rate (in/min)	0.0025	0.0025	0.0025
Peak Shear Stress (ksf)	0.95	1.72	3.22
Residual Shear Stress (ksf)	0.00	0.00	0.00

Initial Height of Sample (in)	1.000	1.000	1.000
Post-Consol. Sample Height (in.)	0.949	0.879	0.847
Post-Shear Sample Height (in.)	0.875	0.850	0.814
Diameter of Sample (in)	2.416	2.416	2.416

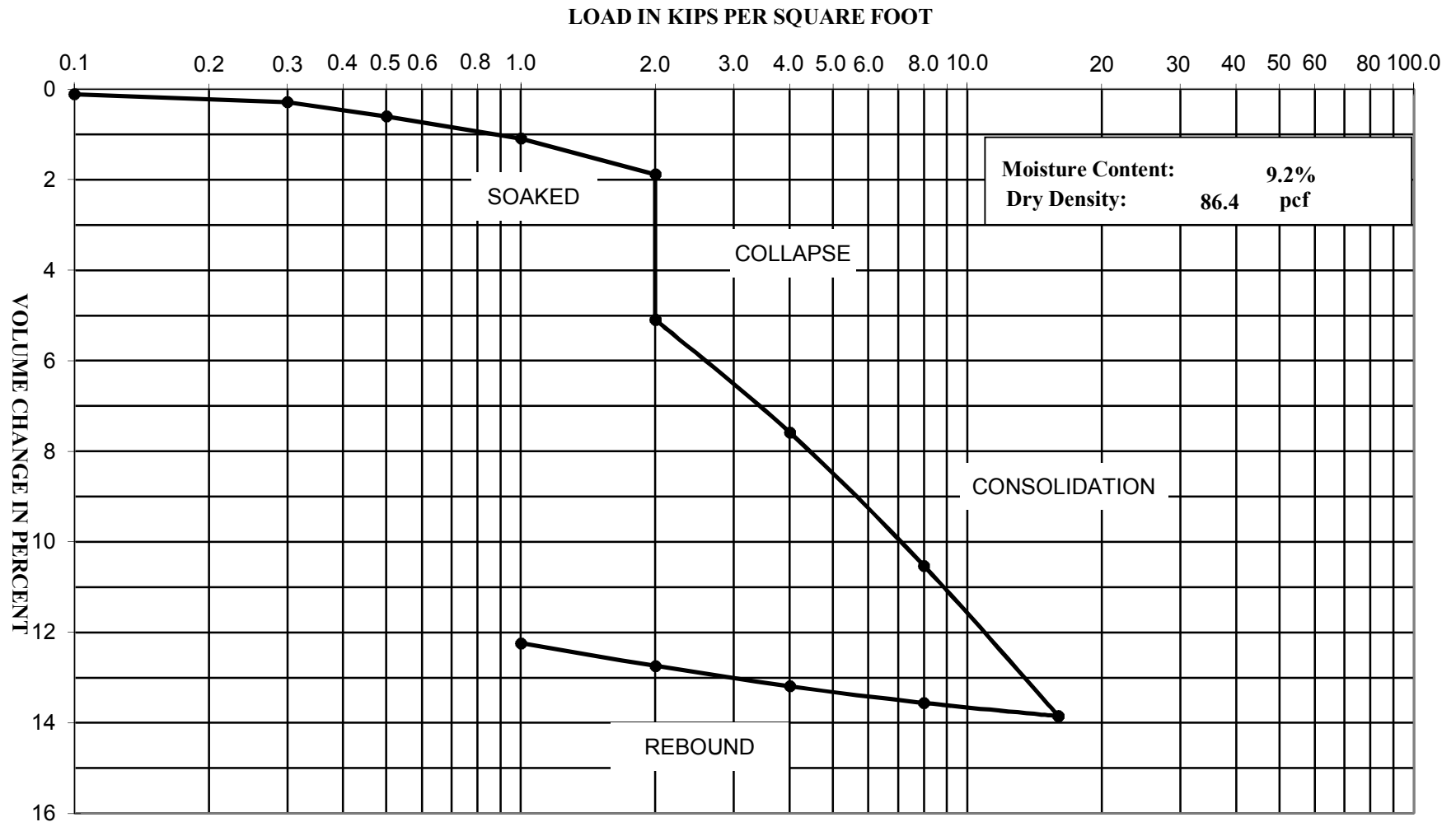
Initial (pre-shear) Values			
Moisture Content (%)	4.7		
Dry Density (pcf)	89.3	94.4	94.7
Saturation %	14.2	16.1	16.2
Void Ratio	0.90	0.80	0.79
Consolidated Void Ratio	0.80	0.58	0.52

Final (post-shear) Values			
Final Moisture Content (%)	29.7	30.4	21.9
Dry Density (pcf)	91.3	100.3	107.1
Saturation %	76.1	91.5	85.3
Void Ratio	1.06	0.90	0.70



Peak Shear Strength Values		Residual Shear Strength Values	
Slope	0.76	Slope	0.00
Friction Angle	37	Friction Angle	0
Cohesion (psf)	195	Cohesion (psf)	0

Figure B7
CONSOLIDATION - PRESSURE TEST DATA
ASTM D2435

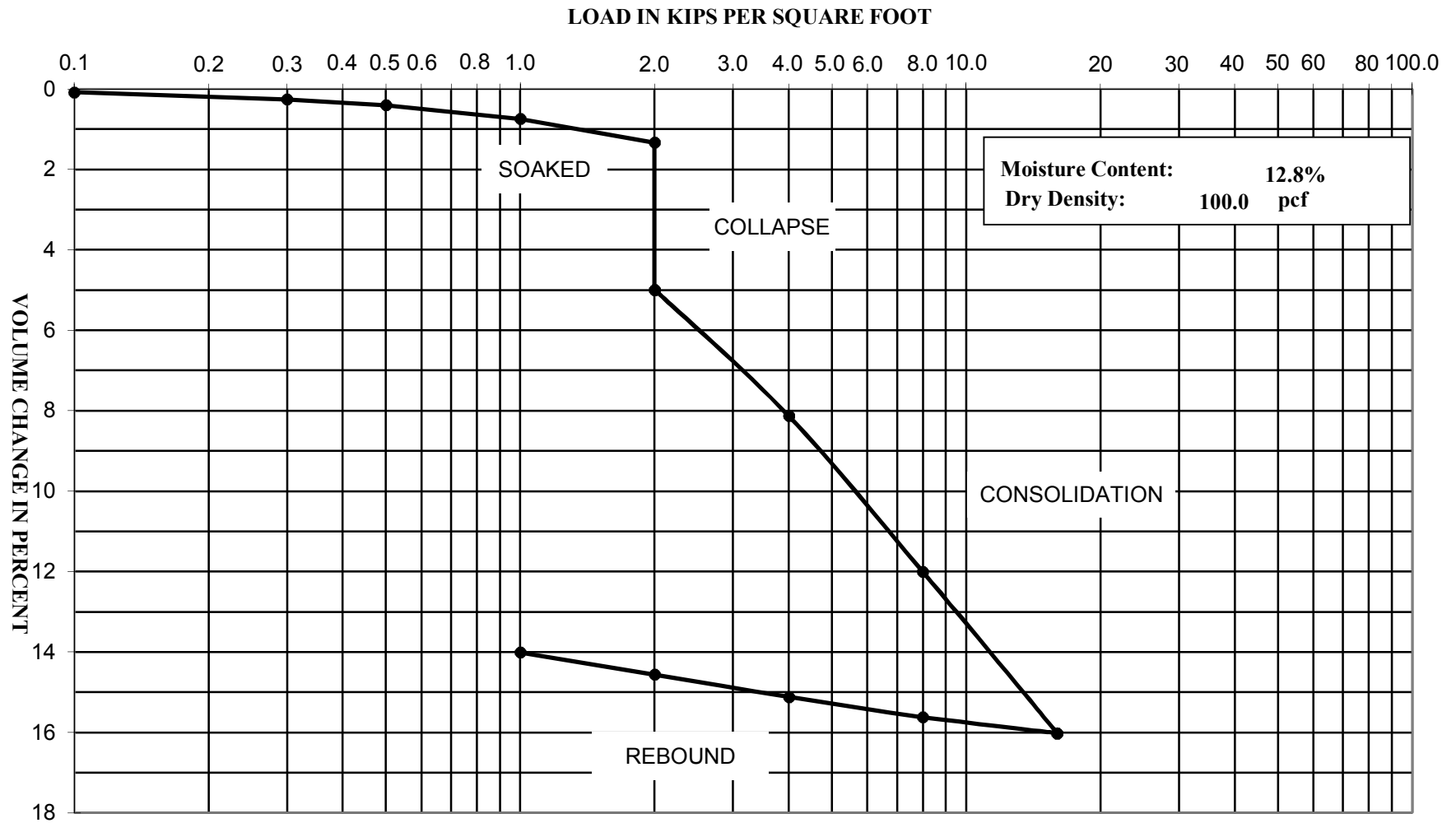


Project Name: New Subdivision

Project Number: 19G-0600-0/02

Boring: B-4 @ 5.5'

Figure B8
CONSOLIDATION - PRESSURE TEST DATA
ASTM D2435



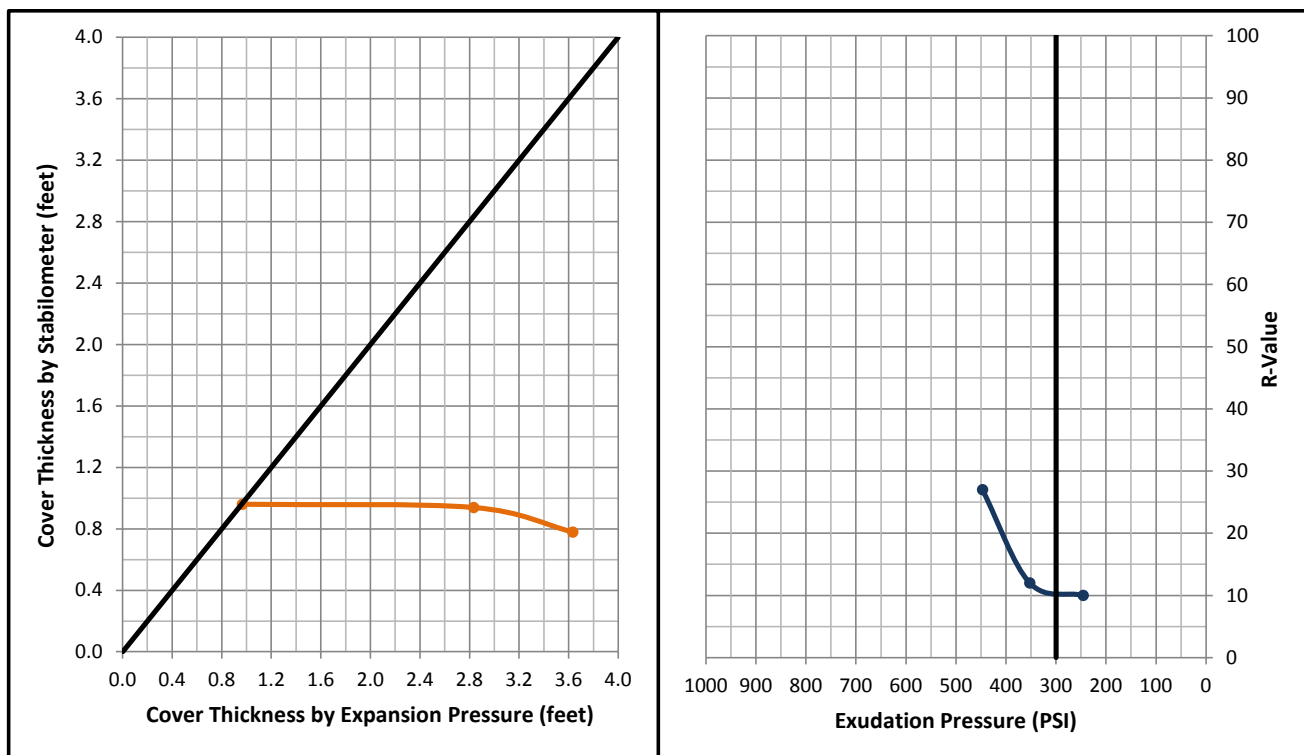
Project Name: New Subdivision
Project Number: 19G-0600-0/02
Boring: B-8 @ 5.5'



Figure B9
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of
Compacted Soil

Project Number:	19G-0600-0/02	Lab ID:	19-003333
Project Name:	New Subdivision	Date Sampled:	11/9/2019
Sampled By:	Megan S.	Date Tested:	11/15/2019
Tested By:	Ryan R.		
Sample Location:	B-2 @ 1' - 3'		
Description:	Sandy CLAY, fine grained, light brown		

"R" Value at 300psi Exudation Pressure:	10
"R" Value by Expansion Pressure:	9



Specimen:	1	2	3
Exudation Pressure Load (lbs):	3085	4426	5612
Exudation Pressure (psi):	246	352	447
Expansion * (0.0001 in):	29	85	109
Expansion Pressure (psf):	126	368	472
Stabilometer Value at 2000 lbs:	135	130	109
Displacement:	3.87	3.79	3.13
Resistance "R" Value:	11	13	27
"R" Value Corrected for Height:	10	12	27
Percent Moisture at Test:	24.4	23.5	19.8
Dry Density at Test (pcf):	102.0	104.4	109.7

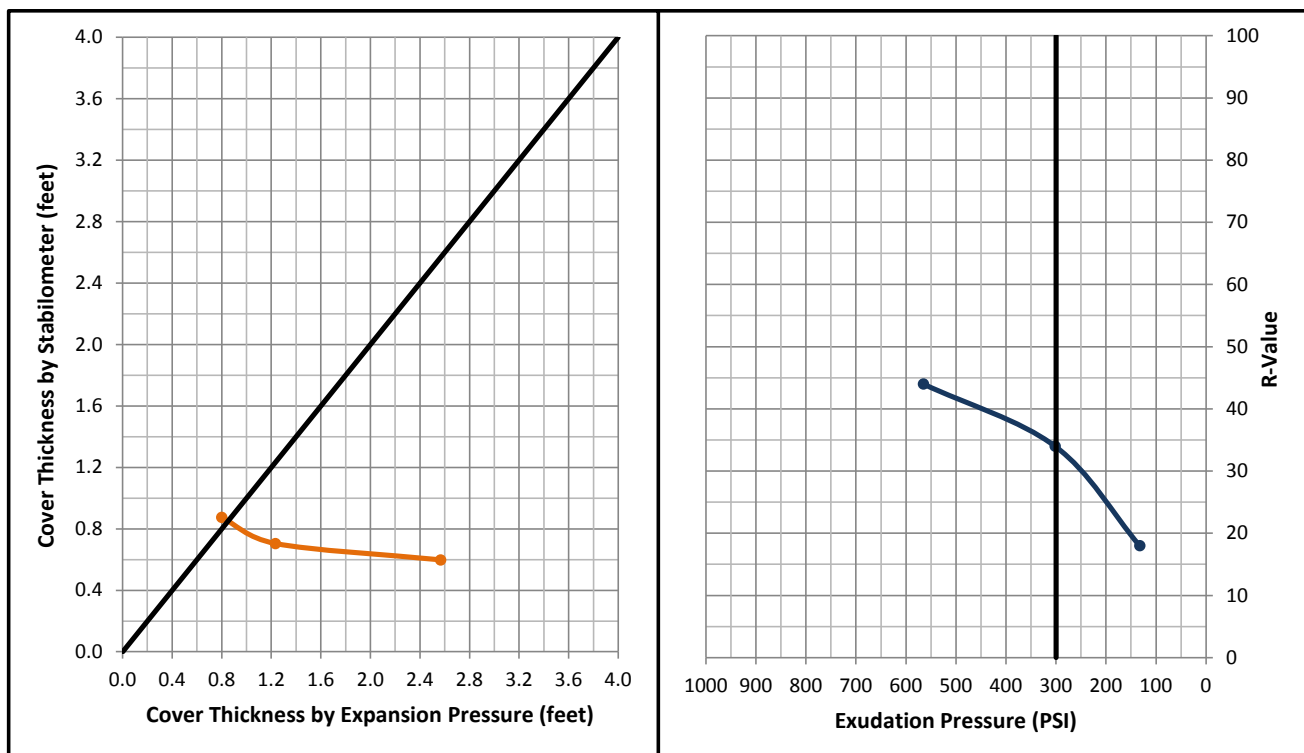
Results relate only to the items inspected or tested. (Statement required per ASTM E329-18 Section 12.1.10) Report shall not be reproduced, except in full, without the prior written approval of the agency (As required per ASTM E329-18 Section 12.1.11)



Figure B10
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of
Compacted Soil

Project Number:	19G-0600-0/02	Lab ID:	19-003342
Project Name:	New Subdivision	Date Sampled:	11/9/2019
Sampled By:	Megan S.	Date Tested:	11/15/2019
Tested By:	Ryan R.		
Sample Location:	B-5 @ 1' - 3'		
Description:	SANDY CLAY, fine to medium grained, light brown		

"R" Value at 300psi Exudation Pressure:	34
"R" Value by Expansion Pressure:	20



Specimen:	1	2	3
Exudation Pressure Load (lbs):	1663	3789	7097
Exudation Pressure (psi):	132	302	565
Expansion * (0.0001 in):	24	37	77
Expansion Pressure (psf):	104	160	333
Stabilometer Value at 2000 lbs:	115	85	68
Displacement:	4.42	4.15	3.86
Resistance "R" Value:	18	35	47
"R" Value Corrected for Height:	18	34	44
Percent Moisture at Test:	19.4	17.6	15.9
Dry Density at Test (pcf):	109.5	113.3	117.1

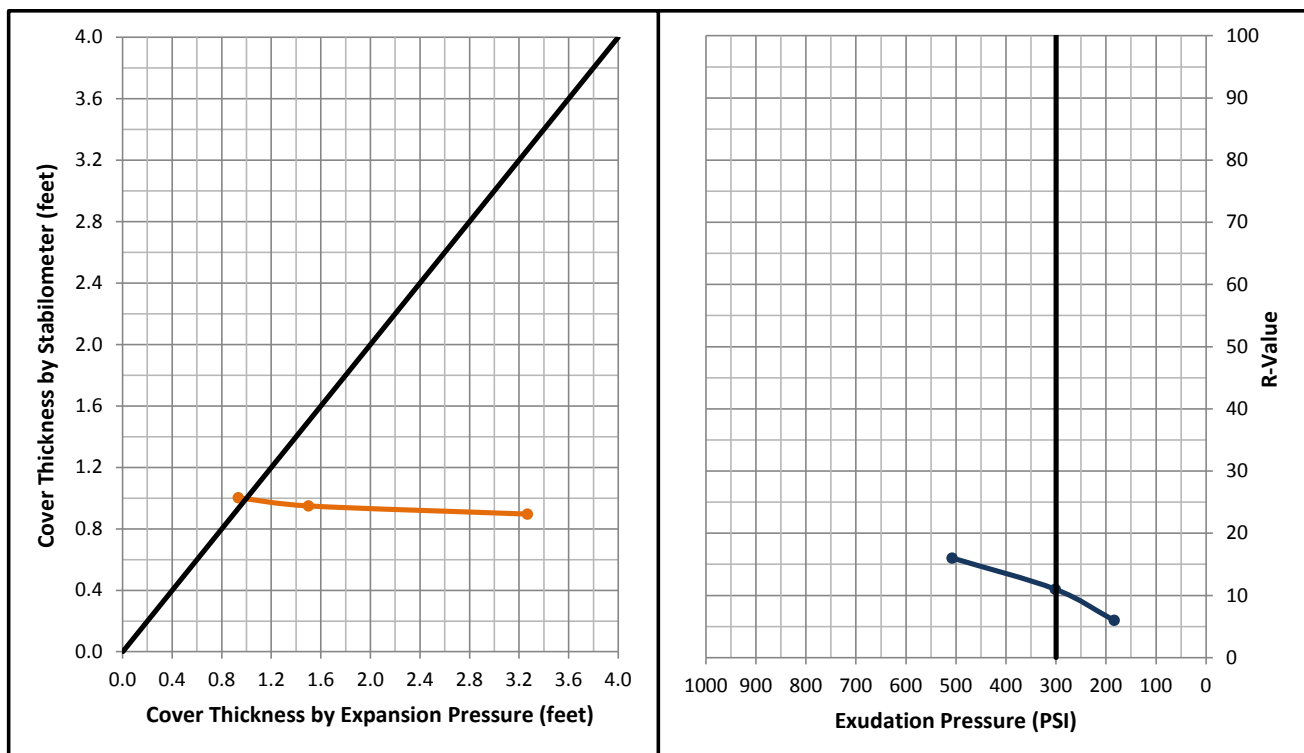
Results relate only to the items inspected or tested. (Statement required per ASTM E329-18 Section 12.1.10) Report shall not be reproduced, except in full, without the prior written approval of the agency (As required per ASTM E329-18 Section 12.1.11)



Figure B11
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of
Compacted Soil

Project Number:	19G-0600-0/02	Lab ID:	19-003355
Project Name:	New Subdivision	Date Sampled:	11/9/2019
Sampled By:	Megan S.	Date Tested:	11/15/2019
Tested By:	Ryan R.		
Sample Location:	B-9 @ 1' - 3'		
Description:	Sandy CLAY, fine grained, yellow brown		

"R" Value at 300psi Exudation Pressure:	11
"R" Value by Expansion Pressure:	9



Specimen:	1	2	3
Exudation Pressure Load (lbs):	2307	3787	6378
Exudation Pressure (psi):	184	302	508
Expansion * (0.0001 in):	28	45	98
Expansion Pressure (psf):	121	195	424
Stabilometer Value at 2000 lbs:	141	133	127
Displacement:	4.37	3.95	3.16
Resistance "R" Value:	7	11	17
"R" Value Corrected for Height:	6	11	16
Percent Moisture at Test:	24.4	23.5	19.8
Dry Density at Test (pcf):	102.0	104.4	109.7

Results relate only to the items inspected or tested. (Statement required per ASTM E329-18 Section 12.1.10) Report shall not be reproduced, except in full, without the prior written approval of the agency (As required per ASTM E329-18 Section 12.1.11)

APPENDIX C

REFERENCES

APPENDIX C

REFERENCES

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APPENDIX D
PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
AVENAL SUBDIVISION
AVENAL, CALIFORNIA

SEE'S JOB 19209P

Submitted to:

HIGHLANDS DIVERSIFIED, INC.

October 11, 2019

Submitted by:

See's Consulting & Testing, Inc.



See's Consulting & Testing, Inc.

Geotechnical Investigation • Forensic Engineering • Environmental Assessment • Construction Inspection & Testing

October 11, 2019

SEE'S JOB 19209P

Mr. Leonel Alvarado
Highlands Diversified, Inc.
5114 E. Clinton Way #111
Fresno, California 93727

**Subject: Phase I Environmental Site Assessment
Avenal Subdivision
Avenal, California**

Gentlemen:

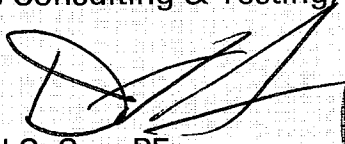
At your request and authorization, we have conducted a Phase I Environmental Site Assessment of the subject property. The enclosed report contains the findings and conclusions of our site observations, inquiries, research of historical information, and the review of regulatory agency lists.

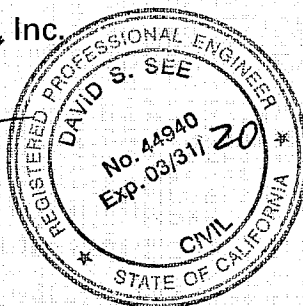
I declare to the best of my professional knowledge and belief, that I meet the definition of Environmental Professional as defined in Section 312.10 of AAI rule. I have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in Title 40, Chapter I, Part 312 of Code of Federal Regulations (40 CFR Part 312).

We appreciate the opportunity to assist you in this study. If you have questions, or need additional information, please do not hesitate to contact us.

Sincerely,

See's Consulting & Testing, Inc.


David S. See, PE
C 44940



Distribution:

- Highlands Diversified, Inc. (via email)

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Figure 2 - Assessor Parcel Map

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**PHASE I ENVIRONMENTAL SITE ASSESSMENT
AVENAL SUBDIVISION
AVENAL, CALIFORNIA**

1.0 INTRODUCTION

This report presents the findings of our Phase I Environmental Site Assessment of the proposed Avenal Subdivision, presently including one parcel comprising 18.65 acres south of Kern Street and east of Corcoran Avenue in Avenal, California. This assessment was conducted at the request of Mr. Leonel Alvarado of Highlands Diversified, Inc., a representative of the potential buyer of the site. The current owner is Cain Trucking Inc. Profit Sharing Trust.

2.0 PURPOSE AND SCOPE

The purpose of this Phase I Environmental Site Assessment was to evaluate the presence of recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), and historical recognized environmental conditions (HRECs) in connection with the subject site.

Recognized environmental conditions (RECs) are defined as the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: 1) due to release to the environment; 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment.

Controlled Recognized environmental conditions (CRECs) are defined as a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

Historical Recognized environmental conditions (HRECs) are defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.

The scope of our assessment was in general conformance with the standards and practices of all appropriate inquiries set forth in Title 40, Chapter I, Part 312 of Code of Federal Regulations and the guidelines in ASTM E1527-13, Standard Practice for Environmental Site Assessment - Phase I Environmental Site Assessment Process and included the following tasks:

- A review of aerial photographs dated 1937, 1950, 1958, 1962, 1973, 1981, 1994, 2006 and 2016;
- A review of available federal, state, and local government regulatory agency lists of known or potential hazardous-waste sites in the vicinity and inquiries to applicable regulatory agencies for information regarding environmental violations and incidents, environmental operations permits, and the status of enforcement actions at the site;
- A reconnaissance of the subject site and surrounding area for visual evidence of hazardous materials storage or presence of recognized environmental conditions including photo documentation of general site conditions;
- Identification of above-ground storage tanks, indications of underground storage tanks, distressed vegetation, ground stains, or landfills, and identification of transformers on site that may contain PCBs;
- Interviews with current and past owners or operators of the property, and with persons made known to us who have knowledge of past and present site usage.

The scope of this assessment did not include laboratory or field analytical testing on or near the site. Furthermore, the assessment did not include evaluation of radon gas or other air-quality or radiological parameters, nor did it include evaluation of the potential presence of asbestos-containing materials, lead, urea-formaldehyde insulation, or testing for PCBs.

3.0 SITE DESCRIPTION

The subject property is 18.65 acres consisting one parcel located south of Kern Street and east of Corcoran Avenue in Avenal, California. A Site Location Map is included as Figure 1. The subject property occupies Kings County Assessors' Parcel Numbers 038260-055 in the southeast quarter of Section 22, Township 22 South, Range 17 East, Mount Diablo Base and Meridian, at an elevation of approximately 820 feet above Mean Sea Level. An Assessor Parcel Map is included as Figure 2. The subject property is currently pasture land. No visible water supply nor sewage disposal is provided to the subject site.

4.0 GEOLOGIC SETTING

The project site is located within the south-central portion of the San Joaquin Valley, a prominent fault-bounded, northwest-trending topographic and structural trough in Central California. Broad coalescing alluvial fans and flood-basin deposits as well as lacustrine and marsh deposits characterize the valley floor. The valley is bounded on the east by the Sierra Nevada Mountains and on the west by the Coast Ranges. The valley fill consists of a thick sequence of Jurassic to Holocene aged marine and continental sediments that reach a thickness of 28,000 feet on the southwest side of the valley. Shallow soil stratigraphy in the Avenal area is primarily sandy soils and sand-silt-clay combination soils.

5.0 HYDROGEOLOGIC SETTING

The project site is within the San Joaquin Basin Hydrologic Study Area, which includes roughly the southern two-thirds of the Central Valley. The San Joaquin Study Area includes 39 groundwater basins and areas of potential storage that have been identified. The boundaries of these storage areas are based largely on hydrologic as well as political conditions. Groundwater in the Study Area may occur in at least three water bodies: perched and unconfined water in the upper aquifer; confined water in the central aquifer; and perched and confined water in the consolidated rock formations (Davis and others, 1959). These aquifers are underlain by a series of unconnected aquifers in the consolidated continental sediments, and in the marine rocks and the basement complex.

General movement of groundwater within the Central Valley is from the flanks of the valley to the axis of the trough on the western side of the valley, and from there toward the Sacramento Delta area. The San Joaquin Valley is an area of substantial groundwater withdrawal and recharge due to municipal and agricultural activities. Wide fluctuations in groundwater levels can be expected due to variations in pumping and irrigation practices. According to California Department of Water Resources Information, groundwater is present in the vicinity of the subject site at a depth of at least 300 feet.

6.0 SITE HISTORY

The site historical usage was identified to the time when the property was not significantly developed. The search intervals were chosen based on the likely or known changes of the site usage.

6.1 Interview with Past and Present Owners, Operators, and Occupants

The following site history is principally based on anecdotal information obtained from Nancy Gimlin, a representative of the property owner. A Preliminary Site Assessment Questionnaire was completed by Nancy Gimlin and attached in Appendix B. A historical title search was beyond the scope of this investigation.

Cain Trucking Inc. Profit Sharing Trust obtained the subject property in 2008. The subject property was bare ground at that time. They have no knowledge of any underground storage tanks (USTs) or above ground storage tanks (ASTs) in connection with the subject property. They are not aware of any other environmental concerns related to the subject property.

6.2 Review of Historical Sources of Information

In an effort to assess past land usage of the subject property and vicinity, aerial photographs from 1937, 1950, 1958, 1962, 1973, 1981, 1994, 2006 and 2016 were reviewed.

1937, 1950, 1958, 1962, 1973 and 1981 Aerial Photos

- The photographs depict the subject property as undeveloped vacant land.
- No structures exist on the subject property.

1994, 2006 and 2016 Aerial Photos

- The photographs depict the subject property as cultivated agricultural land.
- No structures exist on the subject property.
- The photographs depict the subject site and adjacent sites as they did at the time of our site visit.

7.0 VISUAL INSPECTIONS OF THE SITE AND ADJOINING PROPERTIES

See's Consulting personnel visited the subject site on September 23, 2019, to observe the physical conditions of the site and surrounding area and to conduct a Photo Summary (see Appendix A).

Kern Street and wire fence border the subject property on the north. Open pasture borders the property on the south. Wire fence borders the property on the west and east.

7.1 Subject Site Observations

The subject property is located in an area that is characterized by agricultural land. The site is currently cow pasture land. No structure exists at the site. Above-ground storage tanks were not observed on the subject property nor were indications of underground storage tanks. No evidence of the use of hazardous materials or wastes was observed, nor were chemical stains, or drums, observed at the subject property.

7.2 Adjacent Site Observations

See's Consulting personnel conducted a drive-by reconnaissance of properties in the vicinity of the subject site, but an on-site review of neighboring facilities was not conducted as part of this investigation.

The subject property is located in a principally agricultural area. The adjacent sites to the west are plowed field. The adjacent sites to the east are orchards. North-west of the subject site is a new apartment complex. North-east of the subject site is a vacant land. South of the subject property is also cow pasture.

8.0 PROPOSED SITE DEVELOPMENT

Highland Diversified, Inc. plans to development the subject property into a residential subdivision.

9.0 REVIEW OF GOVERNMENT RECORDS

In an effort to identify nearby sites that may be of environmental concern, lists of hazardous sites compiled by various federal, state, and local governmental agencies were reviewed. These databases were reviewed to identify sites within the listed distance of the subject property. The review of these governmental databases is included in an EDR Radius Map Report dated September 20, 2019 for the subject property. The specific information is available in subject report (Appendix D).

9.1 Sites Identified on Databases

The following sites were identified on the above databases as occurring within the listed search distance from the subject property:

SITE	LOCATION	DISTANCE FROM SITE	DATABASE
Avenal Road Yard	Corcoran & Whitney	1/8-1/4 mile	LUST Case Closed
Hernandez trucking	1029 E. Whitney	1/8-1/4 mile	RCRA Non-Generator
Avenal Airport	Highway 33 & High 269	½-1 mile	Envirostor Refer: Other Agency
Reef-Sunset Elem School	Union and Kern Streets	1/4-1/2 mile	Envirostor No Further Action

Based on our review of these databases, these sites have no potential impact to the subject property. Based on our review of the EDR Radius Map Report, there are no recognized environmental conditions or concerns that were identified in connection with the subject site.

10.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Subject Site: We have performed a Phase I Environmental Site Assessment of the subject property in general conformance with the scope and limitations of ASTM Practice E1527, and the standards and practices set forth in Title 40, Chapter I, Part 312 of Code of Federal Regulations (40 CFR Part 312). The subject property was not listed on the federal, state, or local government regulatory agency lists of hazardous and potentially hazardous waste sites reviewed. Indications of unauthorized disposal, dumping or processing of toxic or hazardous materials were not observed on the subject property. No unauthorized waste or wastewater disposal was found at the subject property. Above-ground storage tanks or indications of underground storage tanks were not observed on the subject property.

We have considered commonly known and reasonably ascertainable information about the subject property, the degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation.

It is our opinion that the assessment has not identified recognized environmental conditions indicative of releases or threatened releases of hazardous substances in connection with the subject property. In addition, no controlled recognized environmental conditions, or historical recognized environmental conditions were identified in connection with the subject property.

Adjacent Sites: This assessment has not identified any recognized environmental conditions indicative of releases or threatened releases of hazardous substances in connection with any adjacent sites.

Recommendations: Based on the findings of our assessment, it is our opinion that no recommendations or additional investigation are needed at this time for further evaluation of the environmental conditions of the subject property.

11.0 IDENTIFICATION OF DATA GAPS

No data gaps were identified during our inquiry for this Phase I Environmental Site Assessment report.

12.0 ADDITIONAL INQUIRIES BY REPORT USERS

In addition to the inquiry by an environmental professional (this Phase I Environmental Site Assessment report), persons who seek to establish one of the liability protections under Section 312 of 40 CFR must conduct an investigation including the additional inquiries listed in Section 312.22 of 40 CFR. The persons must consider any specialized knowledge or experience which the persons have concerning the subject property. They also must conduct inquiries of any environmental cleanup liens, the relationship of the purchase price to the fair market value of the subject property if the property was not contaminated, and commonly known and reasonably ascertainable information within the local community about the subject property.

13.0 LIMITATIONS

This Phase I Environmental Site Assessment report has been prepared for the exclusive use of the client noted on the cover page and shall be subject to the terms and conditions in the applicable contract between the client and the consultant. Unauthorized use of, or reliance on, the information contained in this report is strictly prohibited and will be without risk or liability to See's Consulting & Testing unless given express written consent by the consultant.

This assessment is undertaken with the calculated risk that the presence, full nature, and extent of contamination would not be revealed by visual observation alone. Although a site reconnaissance was conducted employing a professional standard of care, no warranty is given, either expressed or implied, that hazardous material contamination or buried structures, which would not have been disclosed through this study, do not exist at the subject site. It should be recognized that this study was not intended to be a definitive study of contamination at the site.

See's Consulting & Testing cannot guarantee the completeness or accuracy of the regulatory agency records reviewed. Additionally, in evaluating the property, we have relied in good faith upon representations and information provided by individuals noted in the report with respect to present operations, existing property conditions, and the historic uses of the property. Furthermore, information gathered from anecdotal recollections should be considered accurate only to the degree by which such statements or recollections may be supported by further corroboration or documentation.

The conclusions presented in this report are professional opinions based on the indicated data described in this report and anecdotal recollections obtained during personal interviews. It is not warranted that such data cannot be superseded by future environmental, legal, geotechnical, or technical developments.

No warranties, either expressed or implied, are made as to the findings or conclusions included in the report. The conclusions presented in this report are intended only for the purpose, site location, and project indicated.

Opinions presented herein apply to site conditions existing at the time of our study and those reasonably foreseeable. Changes in the conditions of the subject site can occur with time because of natural processes or the works of man, on the subject site or on adjacent properties. Changes in applicable standards of practice and regulation can also occur as the result of legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

See's Consulting & Testing



Site Location Map

Map 1



SEE'S CONSULTING & TESTING
4644 E. CARMEN AVENUE
FRESNO, CA 93703
(559) 452-0100

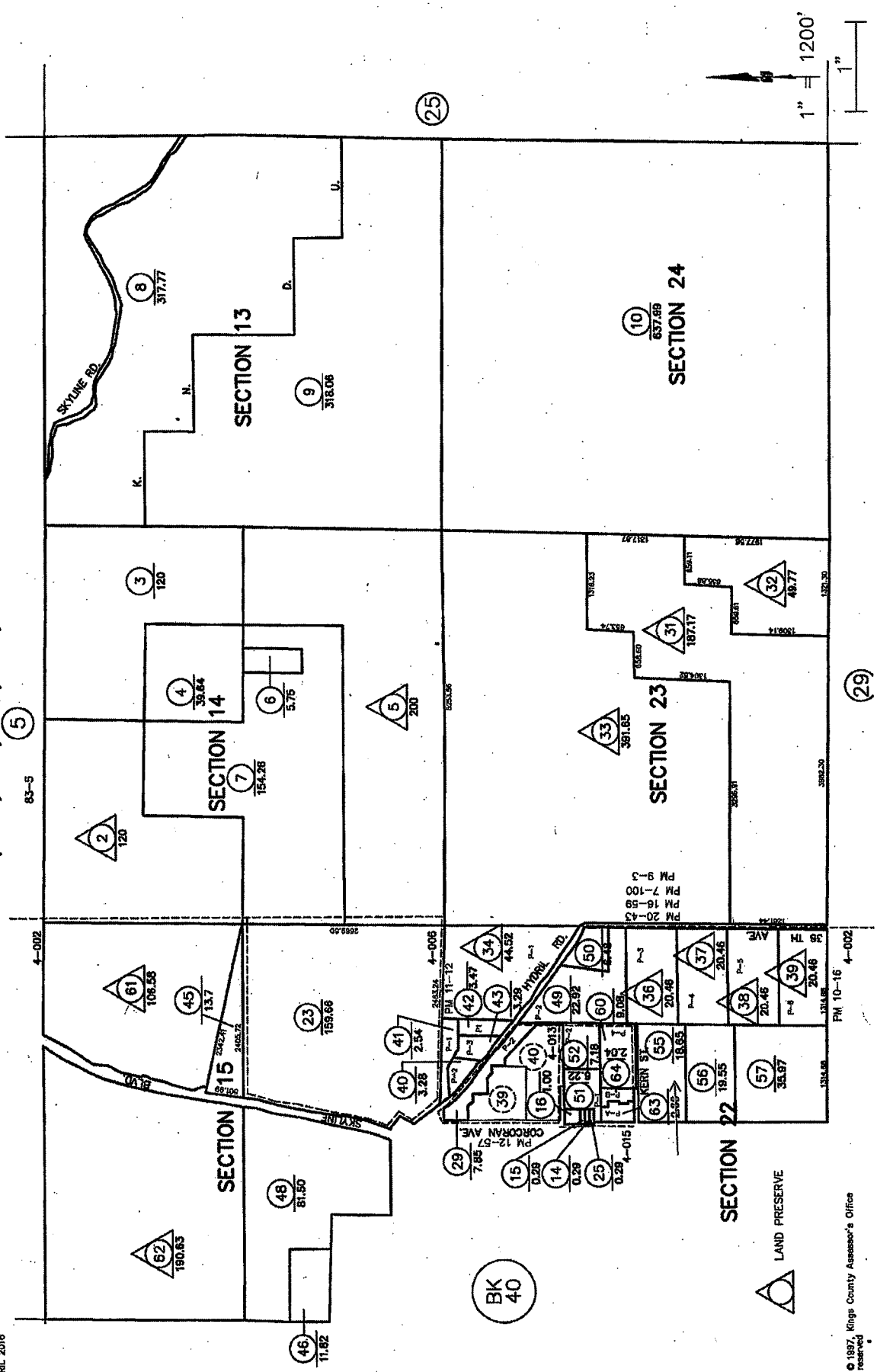
Project Name: Avenal Subdivision
 Site Address: Avenal, CA
 Project Number: 19209P

Provided by:

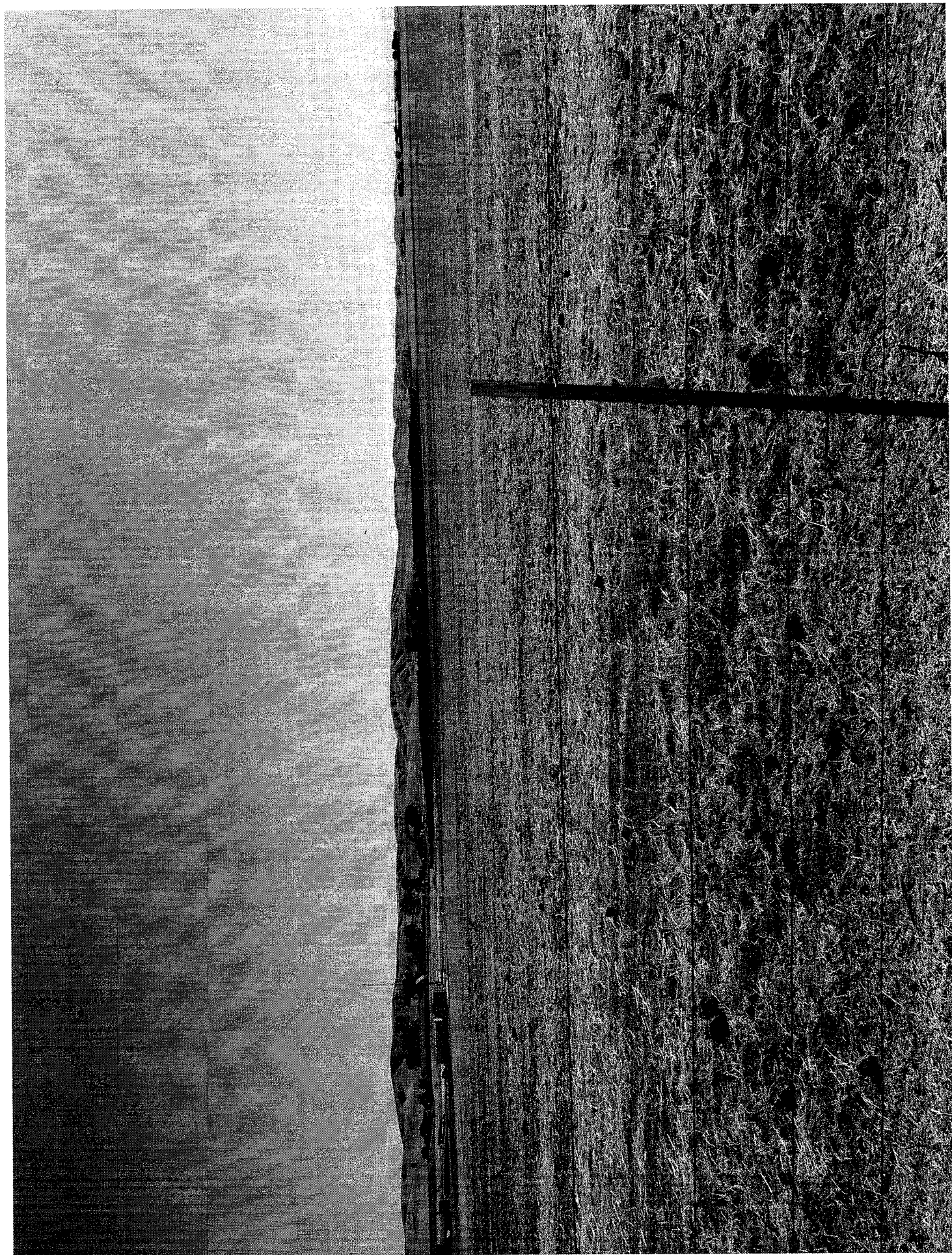
THIS MAP IS FOR ASSESSMENT PURPOSES ONLY
IT IS NOT TO BE CONSTRUED AS PORTRAYING
LEGAL INTERESTS OR DIVISIONS OF LAND FOR
PURPOSES OF EASEMENT OR SUBDIVISION LAW.
APRIL 2016

KINGS COUNTY ASSESSOR'S MAP SEC'S. 13, 14, 15, 22, 23, & 24-22-17

38-26



APPENDIX A
PHOTO SUMMARY



APPENDIX B

PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE



See's Consulting & Testing

Geotechnical Investigation • Forensic Engineering • Environmental Assessment • Construction Inspection & Testing
PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE

SECTION I: SITE INFORMATION

Instructions: Complete the following descriptive information about the subject site. This information accurately describes the location of your site and establishes mailing and phone contacts. If site location and mailing address are identical, you may put "same" into site mailing address spaces.

Date questionnaire completed: 10/7/19

CURRENT SITE NAME: Avenal Property

PAST NAMES (Attach additional pages if necessary):

NAME OF SITE OWNER: Cain Trucking, Inc. Profit Sharing Trust

NAME OF SITE OPERATOR/MANAGER (if any):

SITE LOCATION ADDRESS OR APN NUMBER(S): 038-260-055

CITY: Avenal

COUNTY: Kings County

STATE: Ca

ZIP CODE: 93204

SITE MAILING ADDRESS (if different from SITE LOCATION ADDRESS): 23004 Rd 140

CITY: Tulare

STATE: Ca

ZIP CODE: 93274-9643

SITE TELEPHONE NUMBER: 559-686-5707

SITE FAX NUMBER: 559-686-7915

NAME OF SITE CONTACT PERSON: Paul Barcellos

TITLE OF SITE CONTACT PERSON: V. Pres.

PHONE NUMBER OF SITE CONTACT PERSON: 559-686-5707

ADDRESS OF SITE CONTACT PERSON: SAME

CITY:

STATE:

ZIP CODE:

PREVIOUS OWNER(S):

PREVIOUS OWNER(S) PHONE NUMBER AND/OR ADDRESS:

Reason(s) for requesting the Phase I Environmental Site Assessment:

Sale of Property

The questionnaire information was provided and completed by:

NAME: Nancy Gimlin
TITLE: CFO
FIRM: Cain Trucking Inc Profit Sharing Trust
ADDRESS: 23004 Rd 140 Tulare Ca 93274-9643
PHONE NUMBER: 559-686-5707
DATE: 10/7/19
ROLE(S) AT THE SITE: _____

NUMBER OF YEARS AT THE SITE: _____

RELATIONSHIP TO USER (FOR EXAMPLE: EMPLOYEE, AGENT, CONSULTANT, PRINCIPAL): _____

IF THE PREPARER(S) IS DIFFERENT FROM THE USER, COMPLETE THE FOLLOWING: _____

NAME OF USER: _____

USER'S ADDRESS: _____

USER'S PHONE NUMBER: _____

COPIES OF THE COMPLETED QUESTIONNAIRE HAVE BEEN MAILED OR DELIVERED TO: _____

See's Consulting + Testing

PREPARER REPRESENTS THAT TO THE BEST OF THE PREPARER'S KNOWLEDGE, THE ABOVE STATEMENTS AND FACTS ARE TRUE AND CORRECT, AND TO THE BEST OF THE PREPARER'S ACTUAL KNOWLEDGE NO MATERIAL FACTS HAVE BEEN SUPPRESSED OR MISSTATED.

Signature: _____

Signature: _____

Signature: _____

Date: 10/7/19

Date: _____

Date: _____

PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE

SECTION II: SITE HISTORY

Instructions: Complete this section regarding facility history by circling the appropriate answer, based on reasonably available knowledge of the facility. This section will determine if past operating practices and significant historical events that occurred at the facility indicate potential areas of contamination. Current and past employees who know about the facility's past operating practices can be an asset in completing this section of the checklist. "YES", "UNK" (Unknown), or no response, is presumed to be a potential environmental concern which means that careful attention must be paid to these areas and considerations when completing the facility walk-through inspection.

1.	To your knowledge, has there been any disposing of hazardous chemicals or hazardous wastes in, on, or under the property?	YES	NO	UNK
2.	Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property? If YES, explain: _____	YES	NO	UNK
3.	Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property? If YES, explain: _____	YES	NO	UNK
4.	Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases?	YES	NO	UNK
	a. Do you know the past uses of the property? If yes, explain <u>Bare ground</u>	YES	NO	UNK
	b. Do you know of specific chemicals that are present or once were present at the property? If yes, explain _____	YES	NO	UNK
	c. Do you know of spills or other chemical releases that have taken place at the property? If yes, explain _____	YES	NO	UNK
	d. Do you know of any environmental cleanups that have taken place at the property? If yes, explain _____	YES	NO	UNK
5.	Is the property served by a private well or non-public water system?	YES	NO	UNK
	a. If yes to #5, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	YES	NO	UNK
	b. If yes to #5, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environmental/health agency?	YES	NO	UNK
6.	Do you have in your possession, or do you know of the existence of any photographs, geophysical reports, analytical test data, and/or air sampling data that indicates the possible presence of hazardous materials and/or waste in unwarranted or unexpected areas of the site?	YES	NO	UNK
7.	To your knowledge, has the site ever had liquid/sludge containment area(s), surface impoundment(s), collection pond(s), and/or lagoon(s)? Circle which one	YES	NO	UNK
8.	To your knowledge, have land-farming (bioremediation of contaminated soils by spreading out the soil and tilling periodically to provide aeration) or bioremediation been used at the site?	YES	NO	UNK
9.	To your knowledge, have ash and/or combustion residuals been disposed of at the site?	YES	NO	UNK
10.	To your knowledge, have there been fires and/or explosions at the site which may have caused a release of hazardous waste or materials?	YES	NO	UNK
11.	To your knowledge, has the site ever received complaints from any employees, neighbors, or the public about the site's practices for managing hazardous wastes, or any actual or potential releases to air, water, or soil, or other environmental issues? Circle which one	YES	NO	UNK
12.	To your knowledge, have nearby residents complained to a governmental agency about any type of illnesses or unusual illnesses as having been caused or suspectedly caused by or related to activities at the site? (Note: this item does not require questioning the site's neighbors). If YES, indicate the person and/or agency who recorded the complaint.	YES	NO	UNK

PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE

13.	If YES to question 13, to your knowledge, has any evidence been submitted to a physician to substantiate the claim?	YES	NO	UNK
14.	To your knowledge, are there any areas at the site which were formerly used for hazardous waste or hazardous materials transfer (e.g. tank loading areas, drum transfer areas)?	YES	NO	UNK
15.	Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?	YES	NO	UNK
16.	Are you aware of any engineering controls, (ie: capping, slurry walls, or point of use water treatment) or institutional controls (ie: deed restrictions, restrictive covenants, easements, or zoning) that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state, or local law? Circle which one	YES	NO	UNK
17.	Do you have any special knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	YES	NO	UNK
18.	Does the purchase price being paid for this property reasonably reflect the fair market value of the property?	YES	NO	UNK
	a. If you conclude that there is a lower purchase price, do you believe the lower purchase price is because contamination is known or believed to be present at the property?	YES	NO	UNK
19.	Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?	YES	NO	UNK
20.	Is the property used for an industrial use?	YES	NO	UNK
21.	Is any adjoining property used for an industrial use?	YES	NO	UNK
22.	Did you observe evidence or do you have any prior knowledge that the property has been used for an industrial use in the past?	YES	NO	UNK
23.	Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	YES	NO	UNK
24.	Based on your knowledge of fire insurance maps or local street directories, if any, are any buildings or other improvements on the property or on an adjoining property identified as having been used for an industrial use or uses likely to lead to contamination of the property?	YES	NO	UNK
25.	Is the property currently used as a gasoline station, motor repair site, commercial printing site, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling site (if applicable, identify which)?	YES	NO	UNK
26.	Is any adjoining property currently used as a gasoline station, motor repair site, commercial printing site, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling site (if applicable, identify which)?	YES	NO	UNK
27.	Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair site, commercial printing site, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling site (if applicable, identify which)?	YES	NO	UNK
28.	Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair site, commercial printing site, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling site (if applicable, identify which)?	YES	NO	UNK
29.	Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individuals containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the site? List _____	YES	NO	UNK

PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE

30.	Did you observe evidence or do you have any prior knowledge that there have previously been any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the site? List _____	YES	<input checked="" type="radio"/> NO	UNK
31.	Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the site? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
32.	Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the site? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
33.	Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
34.	Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
35.	Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
36.	Did you observe evidence or do you have any prior knowledge that there have been previously any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
37.	Is there currently any stained soil on the property? If YES, where: _____	YES	<input checked="" type="radio"/> NO	UNK
38.	Did you observe evidence or do you have any prior knowledge that there has been previously any stained soil on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
39.	Are there currently any registered or unregistered storage tanks (above or underground) located on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
40.	Did you observe evidence or do you have any prior knowledge that there have been previously any registered or unregistered storage tanks (above or underground) located on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
41.	Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
42.	Did you observe evidence or do you have any prior knowledge that there have been previously any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
43.	Is there currently evidence of leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
44.	Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any drains, walls, ceilings, or exposed grounds on the property? If yes, where: _____	YES	<input checked="" type="radio"/> NO	UNK
45.	Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the site?	YES	<input checked="" type="radio"/> NO	UNK
46.	Has the owner or occupant of the property been informed of the <u>past</u> existence of hazardous substances or petroleum products (if any) with respect to the site?	YES	<input checked="" type="radio"/> NO	UNK
47.	Has the owner or occupant of the property been informed of the <u>current</u> existence of hazardous substances or petroleum products (if any) with respect to the site?	YES	<input checked="" type="radio"/> NO	UNK
48.	Has the owner or occupant of the property been informed of the <u>past</u> existence of environmental violations (if any) with respect to the site?	YES	<input checked="" type="radio"/> NO	UNK
49.	Has the owner or occupant of the property been informed of the <u>current</u> existence of environmental violations (if any) with respect to the site?	YES	<input checked="" type="radio"/> NO	UNK
50.	Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or site indicating the presence of hazardous substances or petroleum products or contamination of the property?	YES	<input checked="" type="radio"/> NO	UNK
51.	If Yes to question 51, was further assessment recommended?	YES	<input checked="" type="radio"/> NO	UNK

PRELIMINARY SITE ASSESSMENT QUESTIONNAIRE

52.	Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	YES	<u>NO</u>	UNK
53.	Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a <u>storm water</u> system?	YES	<u>NO</u>	UNK
54.	Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a <u>sanitary sewer</u> system?	YES	<u>NO</u>	UNK
55.	Is there a transformer, capacitor, or any hydraulic equipment at the site. If yes, where _____	YES	<u>NO</u>	UNK
56.	Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	YES	<u>NO</u>	UNK

✓ Please check the box indicating if the property owner, key site manager, or user has one or more of the following documents. If possible, within reasonable time and cost constraints, please provide these documents to See's Consulting & Testing.

1. ☐ Environmental site assessment reports
2. ☐ Environmental compliance reports
3. ☐ Environmental permit(s): eg; solid waste disposal, hazardous waste disposal, wastewater, NPDES, underground injection
4. ☐ Registrations for underground and aboveground storage tanks
5. ☐ Registrations for underground injection systems
6. ☐ Material safety data sheets
7. ☐ Community right-to-know plans
8. ☐ Safety plans: eg; preparedness and prevention plans, spill prevention, countermeasure, control
9. ☐ Reports regarding the hydrogeologic conditions on the property or surrounding areas
10. ☐ Notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the property or relating to environmental liens encumbering the property
11. ☐ Hazardous waste generator notices or reports
12. ☐ Geotechnical studies
13. ☐ Risk Assessments
14. ☐ Recorded Activity and use Limitations (AULs)

APPENDIX C
LIST OF SOURCES

LIST OF SOURCES

Aerial Photograph, 1937, 1950, 1958, 1962, 1973, 1981, 1994, 2006 and 2016,
Environmental Data Resources Inc., The Standard in Environmental
Risk Management Information, Shelton, Connecticut.

EDR Radius Map Report for Avenal Subdivision, September 20, 2019:
Environmental Data Resource, Inc., Shelton, Connecticut.

Kings County Assessor's Parcel Map Book 38, Page 26.

Preliminary Site Assessment Questionnaire by Nancy Gimlin, CFO of Cain
Trucking Inc. Profit Sharing Trust, October 7, 2019.

APPENDIX D

THE EDR REPORT

Note: The section of Government Records Searched/ Data Currency Tracking and the Geotcheck Addendum of the EDR Radius Map Report are not included in Appendix D of this report. Those sections do not provide any direct information on the site environmental conditions. Therefore, those sections have been reviewed by the person who prepared this report and kept in the project file.

APPENDIX E
TRAFFIC IMPACT STUDY

TRAFFIC STUDY
FOR
SINGLE FAMILY RESIDENTIAL
AT THE SOUTHEAST CORNER OF
SOUTH COCORAN AVENUE & KERN STREET
CITY OF AVENAL, CA

Prepared for:

QK

December 2019

Prepared by:



1800 30TH STREET, SUITE 260
BAKERSFIELD, CA 93301

A handwritten signature in blue ink, appearing to read 'Ian J. Parks', is written over a horizontal line.

Ian J. Parks, RCE 58155



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INTRODUCTION

The purpose of this study is to evaluate the potential traffic impact of a single family residential development on the southeast corner of South Corcoran Avenue and Kern Street in the City of Avenal, California.

A. Land Use, Site and Study Area Boundaries

The proposed project consists of 122 single family residential houses. Based on the City of Avenal's General Plan, the current land use designation for the project site is Community Commercial and zoning is Medium Density Residential (MDR).

The scope of the study was developed in association with the City of Avenal Planning Department. Five unsignalized intersections are included in this study as follows:

- Skyline Boulevard (SR 269) & 7th Avenue
- Fresno Street & 7th Avenue
- Fresno Street & Union Avenue
- Fresno Street & Corcoran Avenue
- Kern Street & Corcoran Avenue

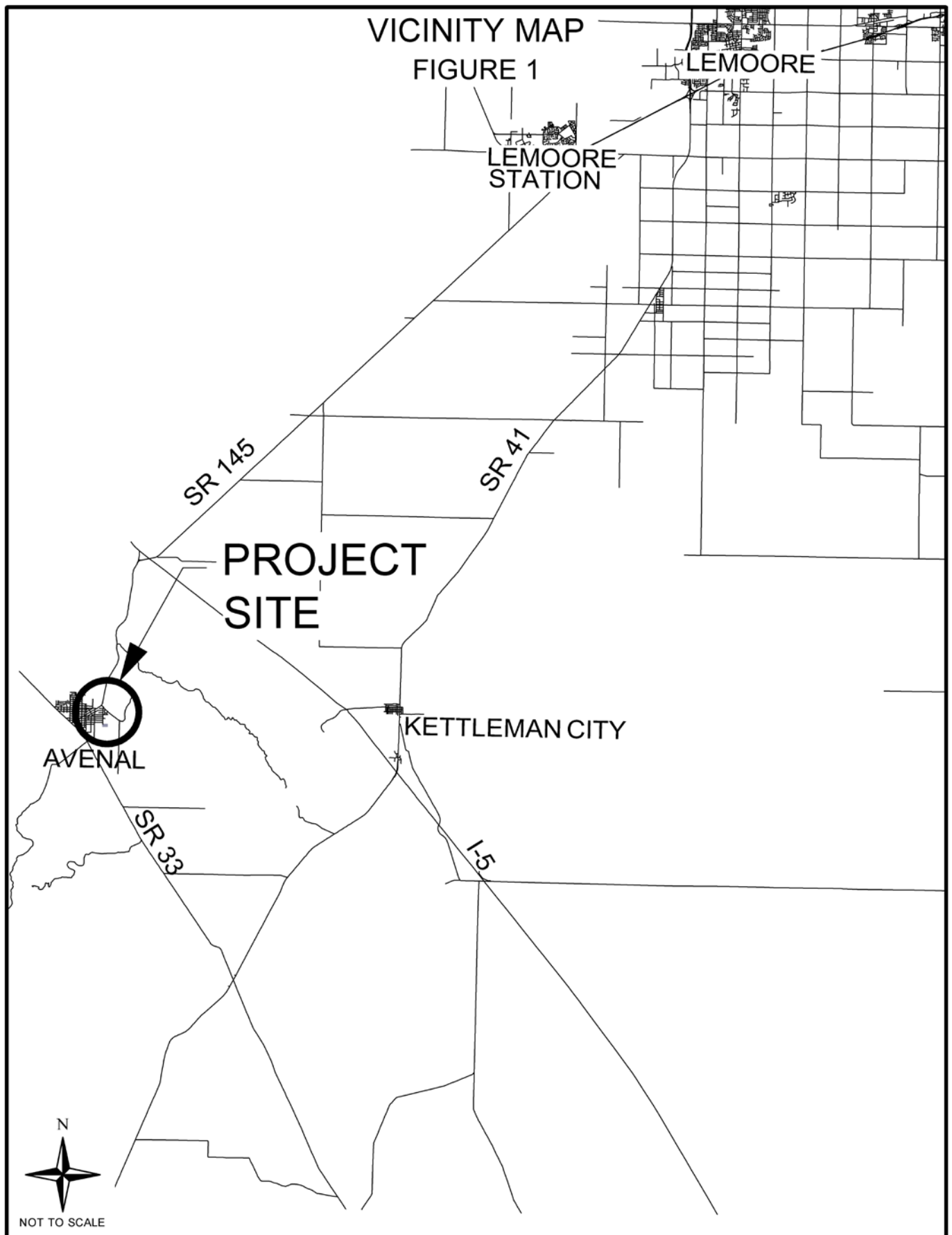
A vicinity map is presented in Figure 1 and a location map is presented in Figure 2.

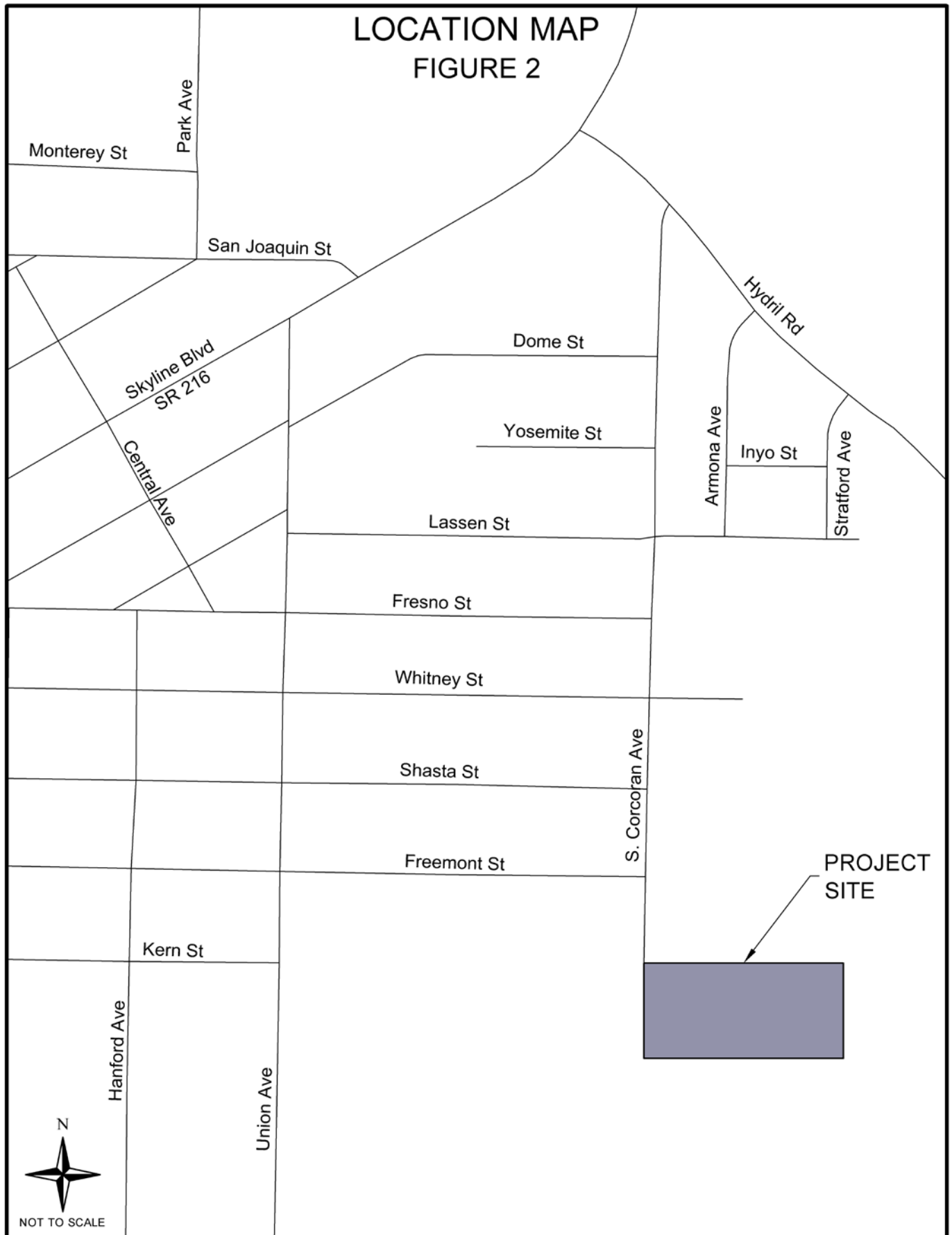
B. Existing Site Uses and Site Access

The project site is currently vacant. Access to the project will be from Kern Street and Corcoran Avenue.

C. Existing Uses in the Vicinity of the Site

Existing land uses in the immediate vicinity of the project include limited agriculture to the east, residential to the north and west, with vacant land to the south.

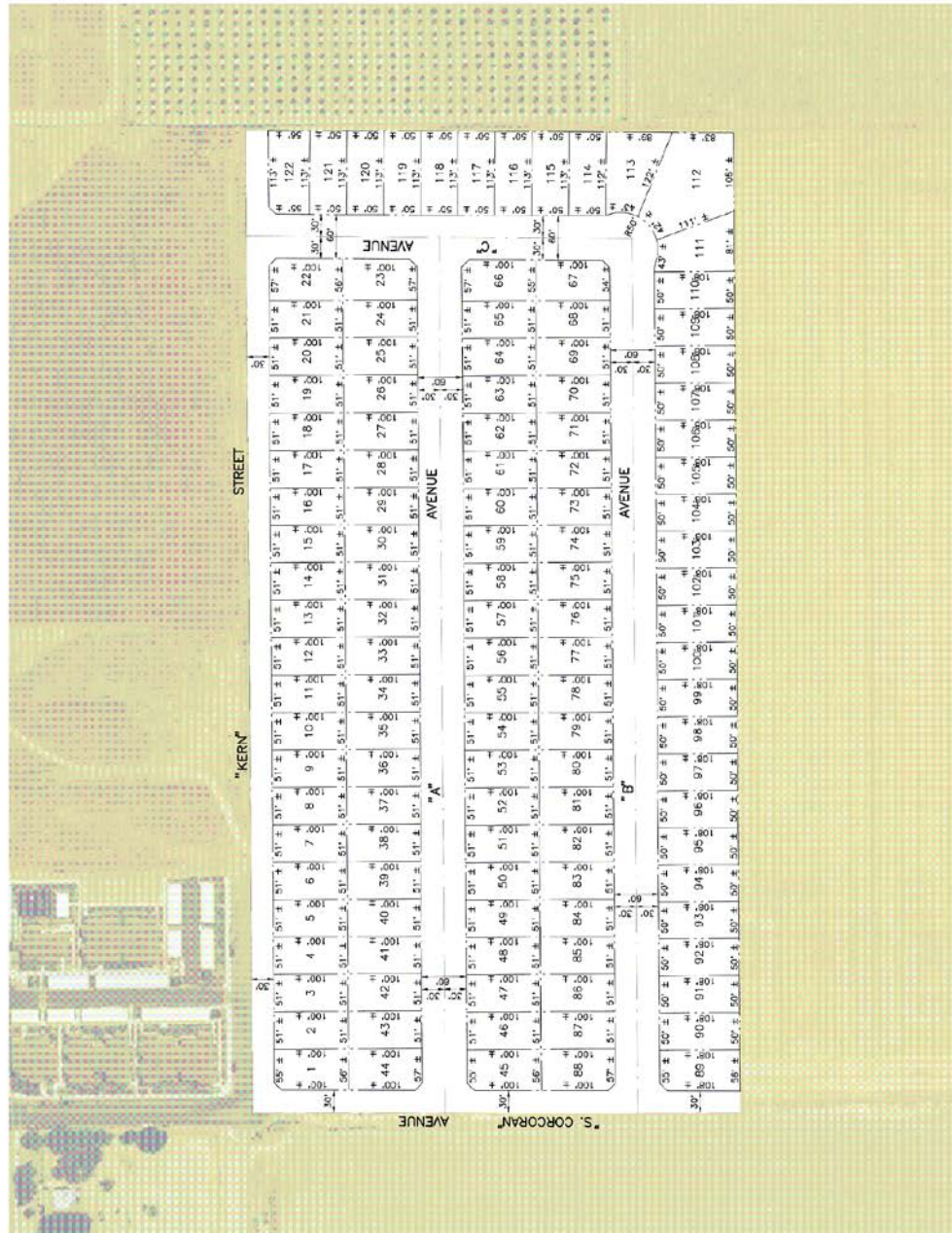
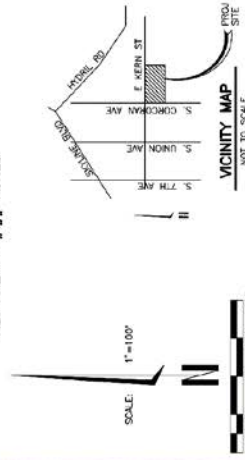




SITE PLAN
FIGURE 3

TENTATIVE SUBDIVISION MAP TRACT NO.

A VESTING MAP
APN: ###-###-##
GROSS AREA = 18.65 ACRES
NET AREA = ## ACRES



NOTES

LEGEND

SITE ADDRESS
S. CORCORAN AVE / KERN ST
AVENUE, CA

PREPARED BY:



D. Existing Street Descriptions

Corcoran Avenue is a north-south collector that extends from Kern Street to Hydril Road and provides access to residential land uses. In the vicinity of the project it exists as a two-lane roadway with curb and gutter.

Fresno Street is an east-west minor collector that extends from Corcoran Avenue to Skyline Boulevard (SR 269) and provides access to residential and commercial land uses. In the vicinity of the project it exists as a two-lane roadway with curb and gutter.

Kern Street is an east-west two-lane collector that extends from 7th Avenue to Union Avenue. An extension of Kern Street west of Corcoran Avenue is anticipated to be constructed concurrently with the project.

Skyline Boulevard (SR 269) is generally north-south arterial that provides access to commercial and residential areas in the city of Avenal. In the vicinity of the project it exists as a two-lane roadway with curb and gutter.

Union Avenue is a north-south minor collector that extends from Salem Avenue to Skyline Boulevard (SR 269) and provides access to residential and school land uses. In the vicinity of the project it exists as a two-lane roadway with curb and gutter.

7th Avenue is a north-south collector that extends from State Route 33 and dead ends into Mariposa Street adjacent to Avenal High School. In the vicinity of the project it exists as a two-lane roadway with curb and gutter.

PROJECT TRIP GENERATION AND DESIGN HOUR VOLUMES

The trip generation and design hour volumes shown in Table 1 were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition. The ADT, AM and PM peak hour rates, and peak hour directional splits for ITE Land Use Code 122 (Single-Family Detached Housing) were used to estimate the project traffic for peak hour of adjacent street traffic.

Table 1
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	122 Dwelling Units	eq	1249	eq	25% 23	75% 69	eq	63% 77	37% 45

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution in Table 2 represents the most logically traveled routes for traffic accessing the project. Project traffic distribution was estimated based on a review of the potential draw from population centers within the region and the type of land use involved. These assumptions were used to distribute project traffic as shown in Figure 4.

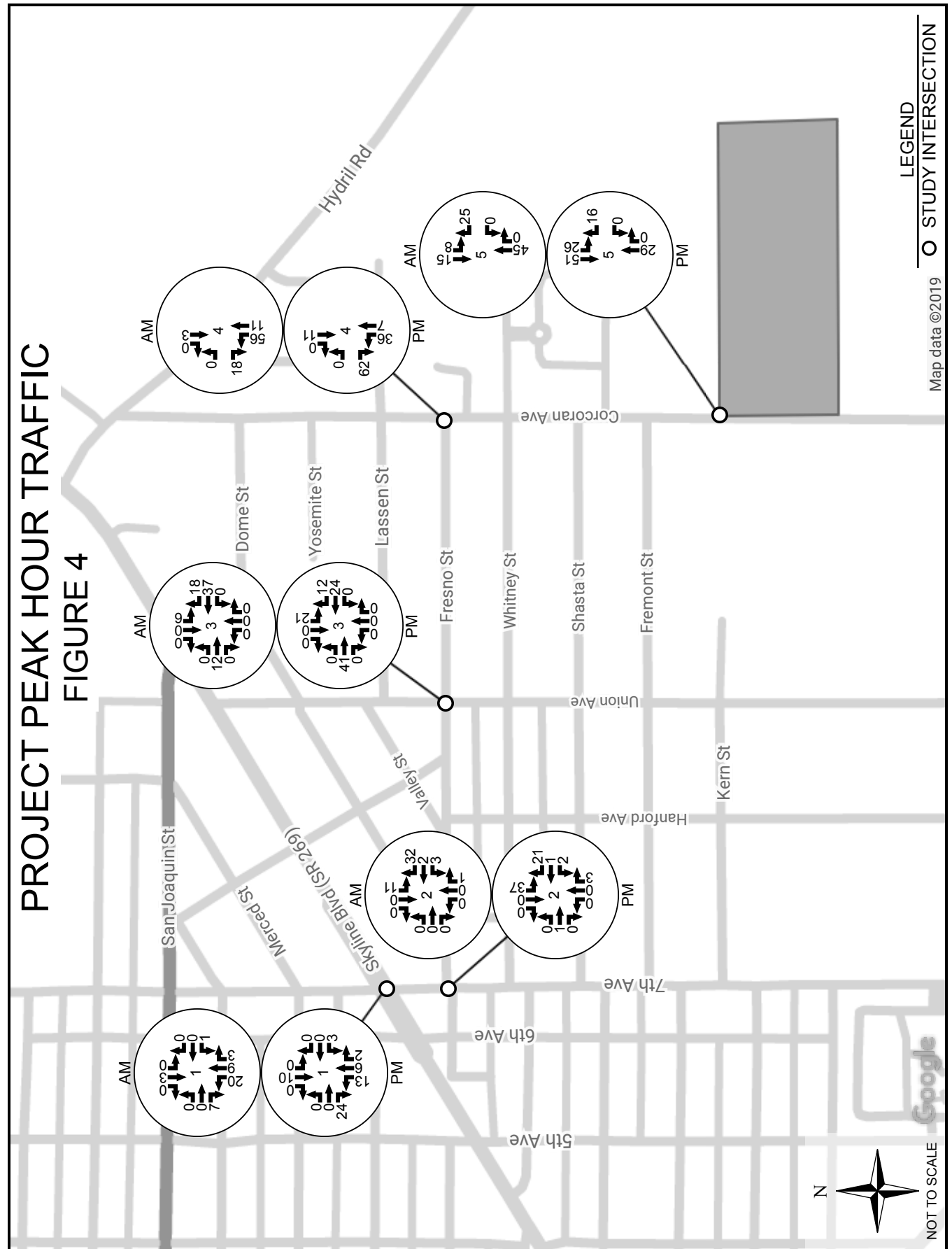
Table 2
Project Trip Distribution

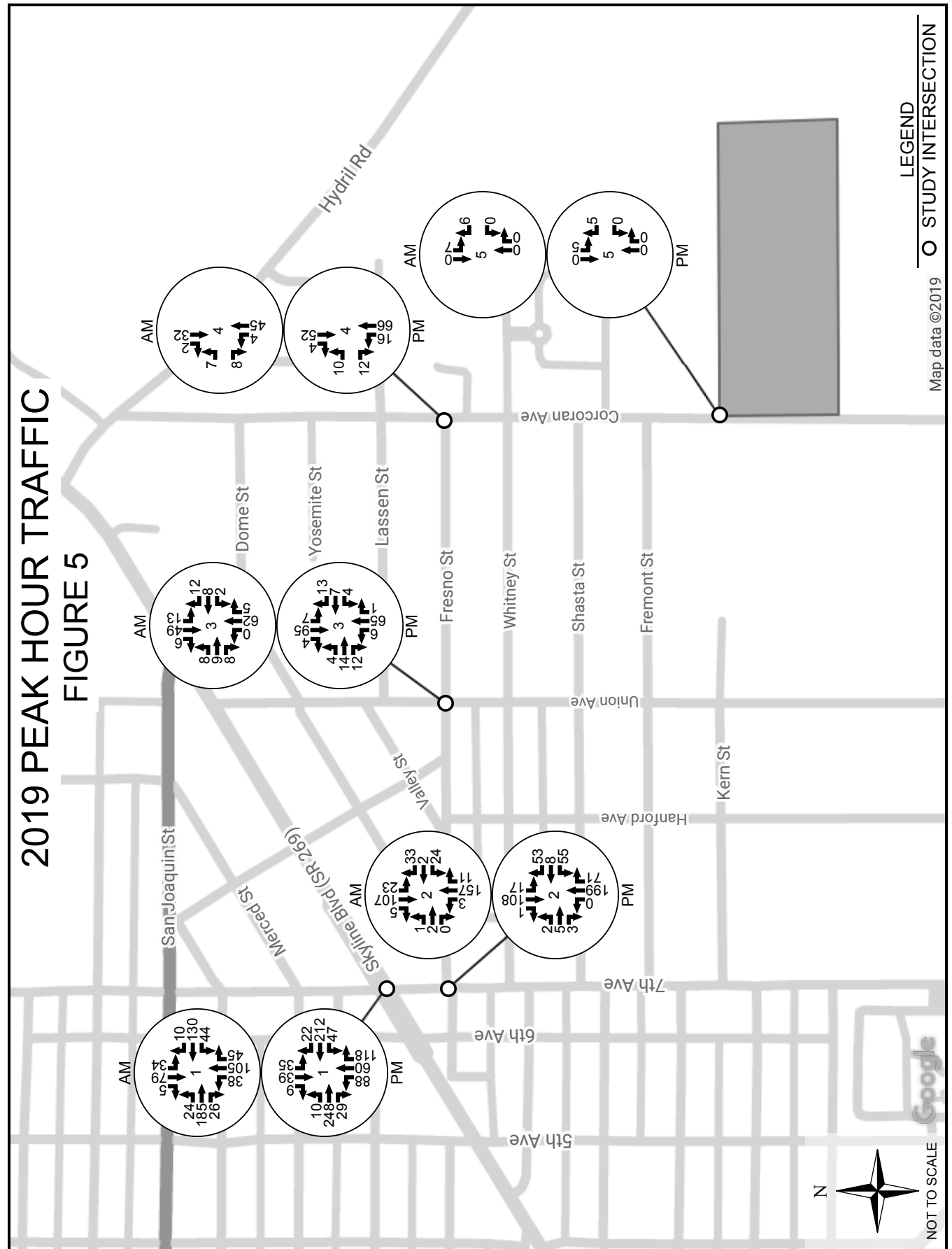
Direction	Percent
North	50%
South	5%
East	0%
West	45%

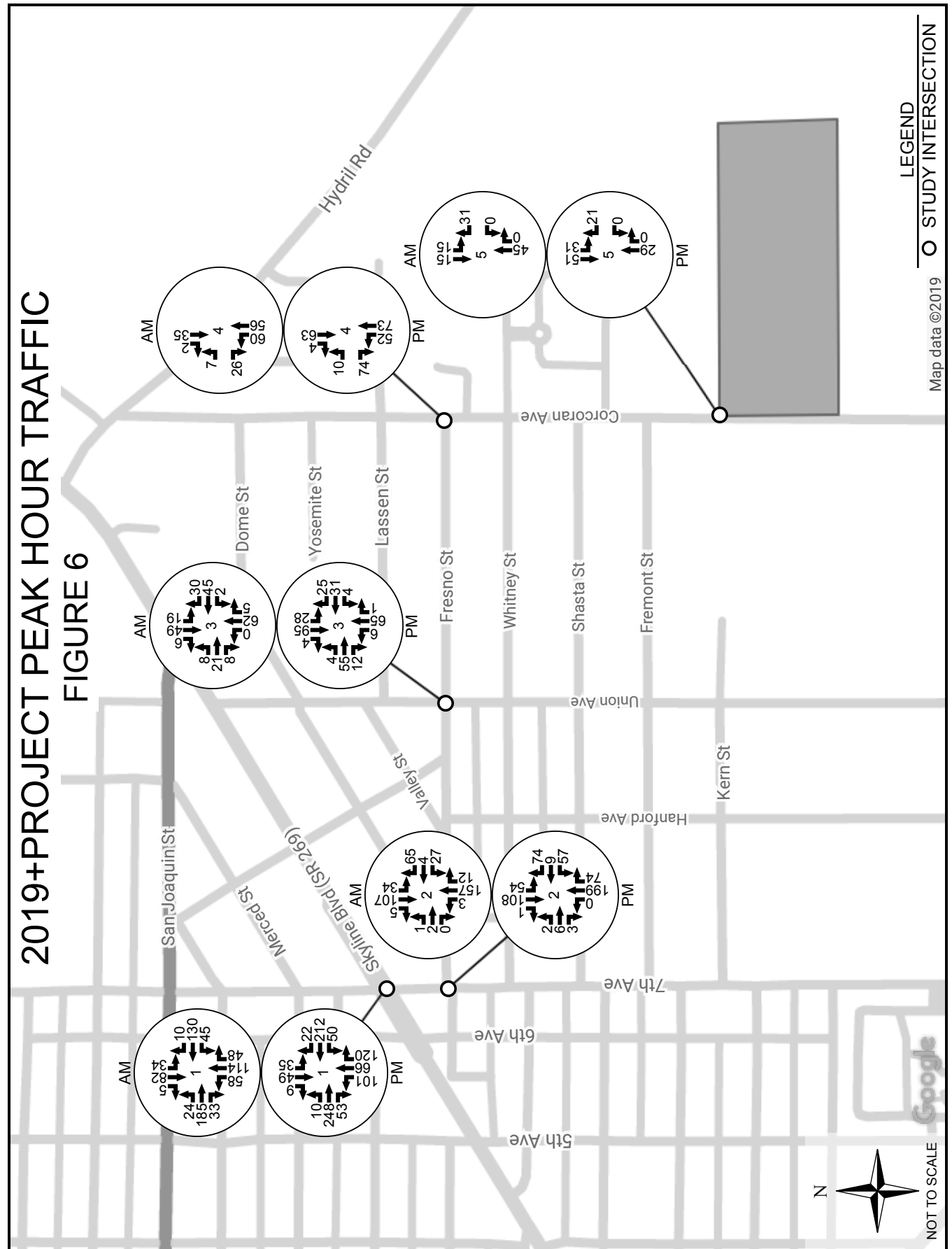
EXISTING AND FUTURE TRAFFIC

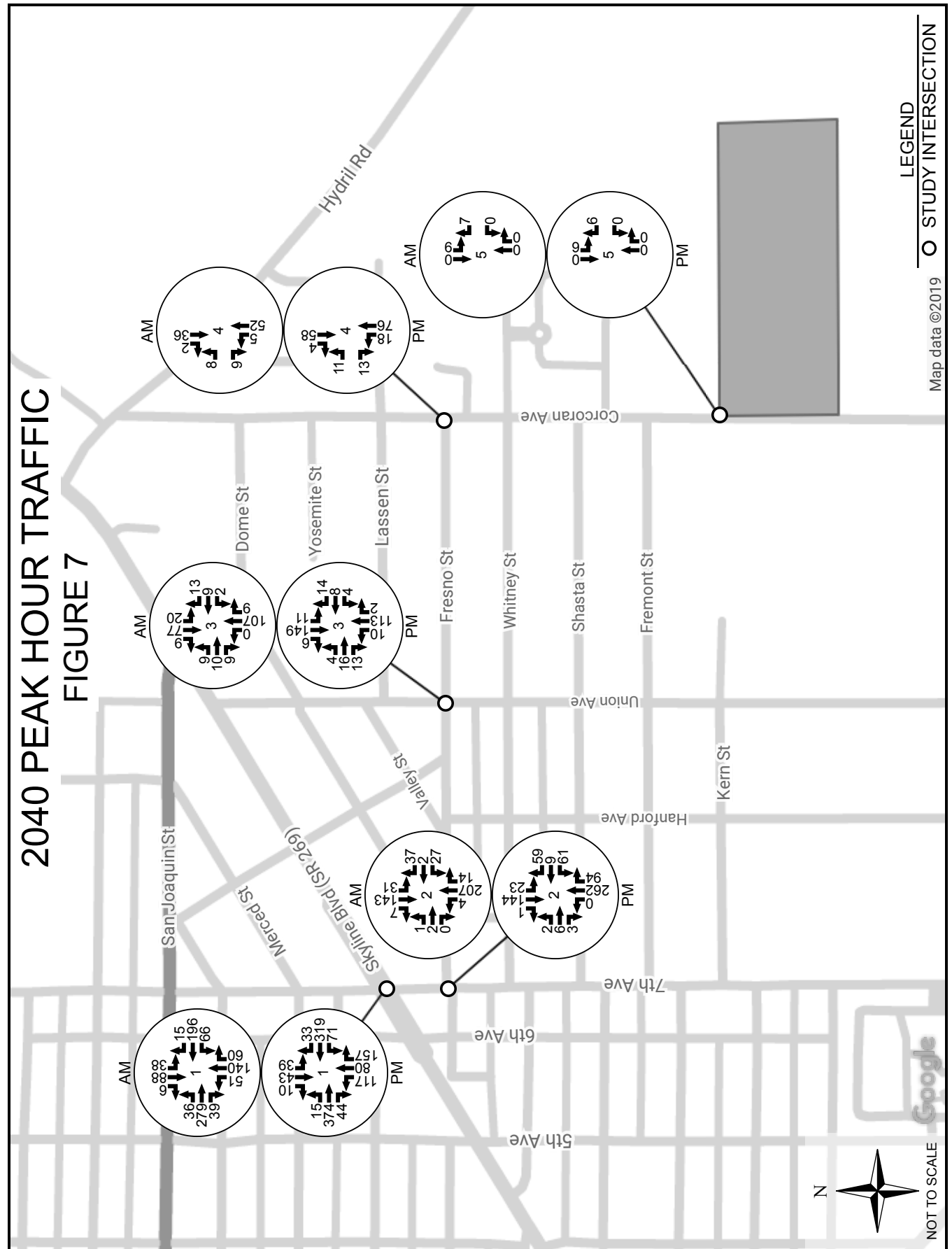
Existing peak hour turn movement volumes were field measured in November 2019 at the study intersections and are shown in Figure 5. Existing plus project peak hour volumes are shown in Figure 6.

Annual growth rates of 0.5% to 1.97% were applied to existing traffic volumes to estimate future traffic volumes for the year 2040. These growth rates were estimated based on a review of KCAG traffic model data. Future peak hour and future peak hour plus project volumes are shown in Figures 7 and 8, respectively.









INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro 9 software from Trafficware. This software utilizes the capacity analysis methodology in the Transportation Research Board's 2010 Highway Capacity Manual. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2019)
- Existing+Project (2019)
- Future Cumulative (2040)
- Future Cumulative+Project (2040)

Criteria for intersection level of service (LOS) are shown in the tables below.

LEVEL OF SERVICE CRITERIA UNSIGNALIZED INTERSECTION

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤ 10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

LEVEL OF SERVICE CRITERIA SIGNALIZED INTERSECTIONS

Volume/Capacity	Control Delay (sec/veh)	Level of Service
< 0.60	≤ 10	A
0.61 - 0.70	> 10 and ≤ 20	B
0.71 - 0.80	> 20 and ≤ 35	C
0.81 - 0.90	> 35 and ≤ 55	D
0.91 - 1.00	> 55 and ≤ 80	E
> 1.0	> 80	F

As stated in the City of Avenal Circulation Element, the peak hour level of service shall be no lower than LOS "D" for Collector and Arterial streets and LOS "C" for local streets, unless improvements necessary to achieve LOS "C" would create unsafe conditions for pedestrians, cyclists, people with

disabilities, and/or transit users. Levels of service for the study intersections are presented in Tables 3a and 3b. The intersection peak hour level of service goal for the study intersections is LOS C or better.

Table 3a
AM Intersection Level of Service

#	Intersection	Control Type	2019	2019+ Project	2040	2040+ Project
1	7 th Avenue & Skyline Boulevard (SR 269)	Signal	C	C	C	C
2	7 th Avenue & Fresno Street	EB WB	B B	B B	B B	B B
3	Union Avenue & Fresno Street	EB WB	A A	B B	B A	B B
4	Corcoran Avenue & Fresno Street	ASWC	A	A	A	A
5	Corcoran Avenue & Kern Street	WB	A	A	A	A

Table 3b
PM Intersection Level of Service

#	Intersection	Control Type	2019	2019+ Project	2040	2040+ Project
1	7 th Avenue & Skyline Boulevard (SR 269)	Signal	C	C	C	C
2	7 th Avenue & Fresno Street	EB WB	B B	B B	B C	B C
3	Union Avenue & Fresno Street	EB WB	B A	B B	B A	B B
4	Corcoran Avenue & Fresno Street	ASWC	A	A	A	A
5	Corcoran Avenue & Kern Street	WB	A	A	A	A

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for each of the unsignalized intersections within the study area based on the California Manual on Uniform Traffic Control Devices (MUTCD). Peak hour signal warrants assess delay to traffic on the minor street approaches when entering or crossing a major street. Signal warrant analysis results for AM and PM peak hours are shown in Tables 4a and 4b.

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service, or operate below an acceptable level of service and not meet signal warrant criteria.

Table 4a
AM Traffic Signal Warrant Analysis

#	Intersection	2019			2019+Project			2040			2040+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	7th Ave at Fresno St	306	59	NO	318	96	NO	406	66	NO	418	103	NO
3	Union Ave at Fresno St	135	25	NO	141	77	NO	222	28	NO	228	79	NO
4	Corcoran Ave at Fresno St	83	15	NO	153	33	NO	95	17	NO	165	35	NO
5	Corcoran Ave at Kern St	7	6	NO	75	31	NO	9	7	NO	77	32	NO

Table 4b
PM Traffic Signal Warrant Analysis

#	Intersection	2019			2019+Project			2040			2040+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	7th Ave at Fresno St	396	116	NO	436	140	NO	524	129	NO	564	153	NO
3	Union Ave at Fresno St	178	30	NO	199	71	NO	291	33	NO	312	74	NO
4	Corcoran Ave at Fresno St	138	22	NO	192	84	NO	156	24	NO	210	86	NO
5	Corcoran Ave at Kern St	5	5	NO	111	21	NO	6	6	NO	112	22	NO

ROADWAY ANALYSIS

A capacity analysis of the study roadways was conducted using HCS software from McTrans. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2019)
- Existing+Project (2019)
- Future Cumulative (2040)
- Future Cumulative+Project (2040)

Table 5
Roadway Level of Service

Street	2019 Directional LOS		2019+Project Directional LOS		2040 Directional LOS		2040+Project Directional LOS	
	N or E AM/PM	S or W AM/PM	N or E AM/PM	S or W AM/PM	N or E AM/PM	S or W AM/PM	N or E AM/PM	S or W AM/PM
Fresno St: 7th Ave to Union Ave	A/A	A/B	A/B	A/B	A/B	A/B	A/B	A/B
Fresno St: Union Ave to Corcoran Ave	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
7th Ave: Skyline Blvd (SR 269) to Fresno St	B/B	B/B	B/B	B/B	B/B	B/B	B/B	B/B
Corcoran Ave: Fresno St to Kern St	A/A	A/A	A/B	A/B	A/A	A/A	A/B	B/B

VEHICLE MILES TRAVELED (VMT) EVALUATION

An evaluation of vehicle miles traveled (VMT) for project traffic was conducted based on applicable California Environmental Quality Act (CEQA) guidelines. The analysis involved comparing an estimate of VMT attributable to the project to a baseline VMT for the Avenal area and assessing whether project VMT would result in a significant transportation impact.

Several factors were taken into consideration when estimating project VMT, including proposed land use and project trip type and distribution. Given the project's close proximity to the SR 269 and I-5, it is estimated that 30 percent of traffic generated by the project would be out-of-town (regional) trips. These trips would utilize SR 269 and/or I-5 to travel to neighboring cities. In-town (local) trips would comprise the remaining 70 percent of project traffic.

Based on the table below, it is anticipated that the project will result in a weighted average VMT of 4.36 miles per vehicle per day. An average daily VMT of 5.95 miles was obtained from the Kings County Association of Governments (KCAG) for use in this study. This baseline average VMT was developed based on household and employment populations in the Avenal area as well as local and regional travel patterns.

Table 6
VMT Analysis

Trip Type	Project ADT	Trip Length	Miles Traveled	Average VMT
Regional	375	26.65	9986	8.00
Local	874	1.03	903	0.72
Average				4.36

The average project VMT of 4.36 miles per vehicle per day is less than the baseline average VMT of 5.95 miles. Therefore, the project is not expected to result in a significant transportation impact.

SUMMARY

This study evaluated the potential traffic impacts of a single-family residential housing project on the southeast corner of South Corcoran Avenue and Kern Street in the City of Avenal.

Intersection Analysis

All intersections operate at an acceptable level of service during peak hours in the existing and future years. All intersections will operate at an acceptable level with the addition of project traffic in the existing and future year scenarios.

Roadway Analysis

All roadways within the project scope operate at acceptable levels of service in the existing and future years. All roadways will operate at an acceptable level with the addition of project traffic in the existing and future year scenarios.

Vehicle Miles Traveled Evaluation

The average project VMT is less than the baseline average for the Avenal area. Therefore, the project is not expected to result in a significant transportation impact.

Conclusion

Based on the City of Avenal's thresholds for determining whether project traffic will have a significant impact on the surrounding intersections and roadways, it is anticipated that the project will have a less-than-significant impact on the transportation network within the vicinity of the project site.

REFERENCES

1. Annual Traffic Census, Kings CAG
2. City of Avenal General Plan, 2018.
3. Highway Capacity Manual, Special Report 209, Transportation Research Board
4. California Manual on Uniform Traffic Control Devices for Streets and Highways, 2014 Edition, Federal Highway Administration (FHA)
5. Trip Generation, 10th Edition, Institute of Transportation Engineers (ITE)

APPENDIX