

# INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

FOR THE

## PARKWOOD SUBDIVISION PROJECT

JUNE 2020

*Prepared for:*

City of Hughson  
7018 Pine Street  
Hughson, CA 95326  
(209) 883-4054

*Prepared by:*

De Novo Planning Group  
1020 Suncast Lane, Suite 106  
El Dorado Hills, CA 95762  
(916) 949-3231



D e N o v o P l a n n i n g G r o u p

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A Land Use Planning, Design, and Environmental Firm





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## Proposed Mitigated Negative Declaration for the Parkwood Subdivision Project

**Lead Agency:**

City of Hughson  
7018 Pine Street  
Hughson, CA 95326

**Project Title:** Parkwood Subdivision

**Project Location:** The Parkwood Subdivision Project site (project site) includes approximately 56.04 acres located at the southeastern corner of the Santa Fe Avenue and Hatch Road intersection in the City of Hughson, Stanislaus County. The site is identified by the following Stanislaus County Assessor's Parcel Numbers (APNs): 018-017-002, -010, and -014. The site has previously been used for agricultural and single-family ranchette uses. Orchards are currently located throughout the project site, including mature and young walnut and almond trees. The project site is generally flat at an elevation of approximately 120 to 140 feet above sea level with slopes increasing to the north.

**Project Description:** The proposed project includes the subdivision of the site into 299 single-family residential lots with one single-family home per lot. The proposed project includes two distinct lot layouts for the residential component: "Park Home Lots", which would include traditional residential lots of approximately 5,005 square feet (sf) to 13,280 sf, and "Courtyard Home Lots", which would include lots of approximately 5,250 sf with a shared driveway (motor court) between a cluster of lots. The project would include 99 Park Homes and 200 Courtyard Homes. The project also includes development of 6.14 acres of park/dual use facilities. Additionally, the project would include development of circulation and utility infrastructure improvements.

The project includes two common space areas totaling 6.14 acres: one in the eastern portion of the subdivision, and one in the western portion of the subdivision. The proposed project will include a masonry wall and landscaping along Santa Fe Avenue (consistent with the existing subdivision to the south of the site), as well as a decorative entry monument. A masonry wall and landscaping will also be provided along the Hatch Road portion of the project area. Additionally, a paved bike and walking/jogging path (Class I Bike Trail) would be provided along the Turlock Irrigation District Ceres canal. The project would be served by existing City water, sewer, and storm drainage infrastructure. Street improvements primarily consist of the construction of internal local streets throughout the project site, as well as three access points.

The project site is currently designated Low Density Residential (LDR), Medium Density Residential (MDR), and Service Commercial (SC) by the City's General Plan land use map. The proposed project would require a General Plan Amendment to change the LDR and SC land uses to MDR. The project site is currently zoned Single-Family Residential (R-1), Medium Density Residential (R-2), and General Commercial (C-2) by the City's zoning map. The proposed project would require a rezone to change the R-1 and C-2 land uses to R-2. The project would also include a Planned Development overlay zone which would allow for reduced setbacks and design flexibility. See the Initial Study for a complete Project Description.

**Findings:**

In accordance with the California Environmental Quality Act, the City of Hughson has prepared an Initial Study to determine whether the proposed project may have a significant adverse effect on the environment. The Initial Study and Proposed Mitigated Negative Declaration reflect the independent judgment of City of Hughson staff. On the basis of the Initial Study, the City of Hughson hereby finds:

*Although the proposed project could have a significant adverse effect on the environment, there will not be a significant adverse effect in this case because the project has incorporated specific provisions to reduce impacts to a less than significant level and/or the mitigation measures described herein have been added to the project. A Mitigated Negative Declaration has thus been prepared.*

The Initial Study, which provides the basis and reasons for this determination, is attached and/or referenced herein and is hereby made a part of this document.

*Lea C. Simvoulakis*

Signature

06/12/2020

Date

## Proposed Mitigation Measures:

The following Mitigation Measures are extracted from the Initial Study. These measures are designed to avoid or minimize potentially significant impacts, and thereby reduce them to an insignificant level. A Mitigation Monitoring and Reporting Program (MMRP) is an integral part of project implementation to ensure that mitigation is properly implemented by the City and the implementing agencies. The MMRP will describe actions required to implement the appropriate mitigation for each CEQA category including identifying the responsible agency, program timing, and program monitoring requirements. Based on the analysis and conclusions of the Initial Study, the impacts of proposed project would be mitigated to less-than-significant levels with the implementation of the mitigation measures presented below.

### AGRICULTURAL RESOURCES

**Mitigation Measure AG-1:** *Prior to approval of the Tentative Map for the project, the project applicant shall comply with the City's Right to Farm Ordinance (Section 17.03.064 of the Municipal Code). In order to comply, the following deed restriction shall be recorded by the owners and run with the land:*

#### *"RIGHT TO FARM DEED RESTRICTION*

*Properly conducted agricultural operations are permitted within Stanislaus County, within the City of Hughson, and its Sphere of Influence. You are hereby notified that the property you are purchasing is in an agricultural area. You may be subject to inconvenience or discomfort from lawful agricultural or agricultural processing facilities operations. Discomfort and inconvenience may include, but are not limited to, noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents and/or the operations of machinery (including aircraft) during any 24 hour period. One or more of the inconveniences described may occur as a result of agricultural operations which are in compliance with existing laws and regulations and accepted customs and standards. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomfort as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. Lawful ground rig or aerial application of pesticides, herbicides and fertilizers occur in farming operations. Should you be concerned about spraying, you may contact the Stanislaus County Agricultural Commission.*

*The City of Hughson Right to Farm Ordinance does not exempt farmers, agricultural processors or others from compliance with law. Should a farmer, agricultural processor or other person not comply with appropriate State, federal or local laws, legal recourse is possible by, among other ways, contacting the appropriate agency. This Right to Farm Deed Restriction shall be included in all subsequent deeds and leases for this property until such time as the City Council shall determine that such a restriction is no longer necessary."*

*Additionally, every transferor of property subject to the notice recorded pursuant to subsection C of Section 17.03.064 shall provide to any transferee in writing the notice of right to farm recited below. The notice of right to farm shall be contained in each offer for sale, counter offer for sale, agreement of sale, lease, lease with an option to purchase, deposit receipt, exchange agreement, rental agreement, or any other form of agreement or contract for the transfer of property; provided, that the notice need be given only once in any transaction. The transferor shall acknowledge delivery of the notice and the transferee shall acknowledge receipt of the notice.*

*The form of notice of right to farm is as follows:*

#### *"NOTICE OF RIGHT TO FARM*

*Properly conducted agricultural operations are permitted within Stanislaus County and within the City of Hughson Sphere of Influence. You are hereby notified that the property you are purchasing/leasing/renting is in an agricultural area. You may be subject to inconvenience or discomfort from lawful agricultural or agricultural processing facilities operations. Discomfort and inconvenience may include, but are not limited to, noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents and/or the operation of machinery (including aircraft) during any 24 hour period. One or more of the inconveniences described may occur as a result of agricultural operations which are in compliance with existing laws and regulations and accepted customs and standards. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomfort as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. Lawful ground rig or aerial application of pesticides, herbicides and fertilizers occur in farming operations. Should you be concerned about spraying, you may contact the Stanislaus County Agricultural Commission.*

*The City of Hughson Right to Farm Ordinance does not exempt farmers, agricultural processors or others from compliance with law. Should a farmer, agricultural processor or other person not comply with appropriate state, federal or local laws, legal recourse is possible by, among other ways, contacting the appropriate agency. This notification is given in compliance with Hughson Municipal Code Section 17.03.064. By initialing below, you are acknowledging receipt of this notification.*

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*Transferor's Initials*

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*Transferee's Initials"*

#### AIR QUALITY

**Mitigation Measure AIR-1:** Prior to the commencement of construction activities for each phase of the project, the project proponent shall prepare and submit a Dust Control Plan that meets all of the applicable requirements of APCD Rule 8021, Section 6.3, for the review and approval of the APCD Air Pollution Control Officer.

**Mitigation Measure AIR-2:** During all construction activities, the project proponent shall implement dust control measures, as required by APCD Rules 8011-8081, to limit Visible Dust Emissions to 20% opacity or less. Dust control measures shall include application of water or chemical dust suppressants to unpaved roads and graded areas, covering or stabilization of transported bulk materials, prevention of carryout or trackout of soil materials to public roads, limiting the area subject to soil disturbance, construction of wind barriers, access restrictions to inactive sites as required by the applicable rules.

**Mitigation Measure AIR-3:** During all construction activities, the project proponent shall implement the following dust control practices identified in Tables 6-2 and 6-3 of the GAMAQI (San Joaquin Valley APCD, 2002).

- a. All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
- b. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- c. All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall control fugitive dust emissions by application of water or by presoaking.
- d. When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least six inches of freeboard space from the top of the container shall be maintained.
- e. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- f. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- g. Limit traffic speeds on unpaved roads to 5 mph; and
- h. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

**Mitigation Measure AIR-4:** Architectural coatings applied to all structures in the project site shall meet or exceed volatile organic compound (VOC) standards set in APCD Rule 4601. The project applicant shall submit to the APCD a list of architectural coatings to be used and shall indicate how the coatings meet or exceed VOC standards. If the APCD determines that any architectural coatings do not meet VOC standards, the project applicant shall replace the identified coatings with those that meet standards.

**Mitigation Measure AIR-5:** Asphalt paving shall be applied in accordance with APCD Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

**Mitigation Measure AIR-6:** Prior to final approval of improvement plans for each phase of the project, the project proponent shall submit an Air Impact Assessment (AIA) application to the San Joaquin Valley Air Pollution Control District for District Rule 9510 Indirect Source Review (ISR) to obtain AIA approval from the District for the phase or project component that is to be constructed. Prior to the issuance of a building permit of each individual phase or project component, the project proponent shall incorporate mitigation measures into the proposed project and demonstrate compliance with District Rule 9510 including payment of all fees.

#### BIOLOGICAL RESOURCES

**Mitigation Measure BIO-1:** The project proponent shall implement the following measures to avoid or minimize impacts on Swainson's hawk:

- No more than 30 days before the commencement of construction, a qualified avian biologist shall perform preconstruction surveys for nesting Swainson's hawk and other raptors during the nesting season (February 1 through August 31).
- Appropriate buffers shall be established and maintained around active nest sites during construction activities to avoid nest failure as a result of project activities. The appropriate size and shape of the buffers shall be determined by a qualified avian biologist, in coordination with CDFW, and may vary depending on the nest location, nest stage, and construction activity. The buffers may be adjusted if a qualified avian biologist determines it would not be likely to adversely affect the nest. Monitoring shall be conducted to confirm that project activity is not resulting in detectable adverse effects on nesting birds or their young. No project activity shall commence within the buffer areas until a qualified avian biologist has determined that the young have fledged or the nest site is otherwise no longer in use.
- Before the commencement of construction, the project proponent shall provide compensatory mitigation for the permanent loss of Swainson's hawk foraging habitat. Mitigation shall be at the CDFW specified ratios, which are based on distance to nests. The Plan Area's distance to the closest nest falls within the range of "within 5 miles of an active nest tree but greater than 1 mile from the nest tree." As such, the Project shall be responsible for 0.75 acres of each acre of urban development authorized (0.75:1 ratio). The project proponent shall either provide lands protected through fee title acquisition or conservation easement (acceptable to the CDFW) on agricultural lands or other suitable habitats which provide foraging habitat for Swainson's hawk.

**Mitigation Measure BIO-2:** The project proponent shall implement the following measure to avoid or minimize impacts on other protected bird species that may occur on the site:

- Preconstruction surveys for active nests of special-status birds shall be conducted by a qualified avian biologist in all areas of suitable habitat within 500 feet of project disturbance. Surveys shall be conducted within 14 days before commencement of any construction activities that occur during the nesting season (February 15 to August 31) in a given area.
- If any active nests, or behaviors indicating that active nests are present, are observed, appropriate buffers around the nest sites shall be determined by a qualified avian biologist to avoid nest failure resulting from project activities. The size of the buffer shall depend on the species, nest location, nest stage, and specific construction activities to be performed while the nest is active. The buffers may be adjusted if a qualified avian biologist determines it would not be likely to adversely affect the nest. If buffers are adjusted, monitoring will be conducted to confirm that project activity is not resulting in detectable adverse effects on nesting birds or their young. No project activity shall commence within the buffer areas until a qualified avian biologist has determined that the young have fledged or the nest site is otherwise no longer in use.

**Mitigation Measure BIO-3:** Prior to approval of any street improvements, the project applicant shall pay to the City the total costs of all the trees, pursuant to Section 12.30.060 of the Municipal Code. The City shall plant the trees at the proper time. Watering and care of the trees thereafter shall be the responsibilities of the applicant or the purchasers of the property. Additionally, pursuant to Section 17.03.092 of the Municipal Code, the project applicant shall not plant trees or shrubs in any street tree area or other public place without permission of the planning officer.

Further, the project applicant shall submit a tree survey to the City, pursuant to Section 17.03.092(E). The location, size, accurate driplines and species of existing trees shall be shown on the tree survey in the same scale as development plans submitted for development review. All trees proposed for removal shall be identified. If there is disturbance proposed within the dripline of a significant tree, a certified arborist's assessment and protection measures shall be provided. If significant trees are proposed for removal, the applicant shall replace them with trees whose size, number, and planting location shall be determined by the planning officer before final occupancy is granted to any new residents. The size and

age of the tree shall be used to determine how many new trees shall be substituted for the removed tree but, at a minimum, three new trees shall replace one tree removed. The ratio may be increased at the discretion of the planning officer.

Where orchard trees are to be cut down, removed, or relocated as part of new development, the planning commission or planning officer shall require the retention of selected orchard trees within the proposed subdivision that are representative of the land's agricultural heritage. For orchards in productive use for at least five years prior to the new development, a minimum of 10 percent of the existing orchard trees shall be preserved. This shall be determined by the planning officer.

#### CULTURAL RESOURCES

**Mitigation Measure CUL-1:** If cultural resources (i.e., prehistoric sites, historic sites, isolated artifacts/features, and paleontological sites) are discovered, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Hughson shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology (or a qualified paleontologist in the event paleontological resources are found) shall be retained to determine the significance of the discovery. The City of Hughson shall consider recommendations presented by the professional for any unanticipated discoveries and shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Specific measures are developed based on the significance of the find.

**Mitigation Measure CUL-2:** If any human remains are found during grading and construction activities, all work shall be halted immediately within 50 meters (165 feet) of the discovery and the County Coroner must be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner shall notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed. Additionally, if the Native American resources are identified, a Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, may also be required and, if required, shall be retained at the applicant's expense.

#### GEOLOGY AND SOILS

**Mitigation Measure GEO-1:** Prior to issuance of any building permits, the developer shall be required to submit building plans to the City of Hughson for review and approval. The building plans shall also comply with all applicable requirements of the most recent California Building Standards Code. All on-site soil engineering activities shall be conducted under the supervision of a licensed geotechnical engineer or certified engineering geologist.

**Mitigation Measure GEO-2:** The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City of Hughson and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB.

#### HYDROLOGY AND WATER QUALITY

**Mitigation Measure HYDRO-1:** The Stormwater Management Plan shall be designed and engineered to ensure that post-project runoff is equal to or less than pre-project runoff. The Plan shall be consistent with Section 7 of the City's Improvement Standards, which establish minimum storm water management requirements and controls. According to the standards, storm drain discharges must include stormwater quality control measures, and stormwater generated must be adequately treated before discharge. The applicant shall provide the City Engineer with all stormwater runoff calculations with the improvement plan submittal.

#### NOISE

**Mitigation Measure NOI-1:** To reduce potential construction noise impacts during project construction, the following multi-part mitigation measure shall be implemented for the project:

- All construction equipment powered by internal combustion engines shall be properly muffled and maintained.

- Quiet construction equipment, particularly air compressors, shall be selected whenever possible.
- All stationery noise-generating construction equipment such as tree grinders and air compressors shall be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- Unnecessary idling of internal combustion engines is prohibited.
- The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- Construction shall be limited to 7 AM to 7 PM on weekdays and 8 AM to 4 PM on Saturdays with no work allowed on Sundays unless otherwise authorized by the City in writing.

*This requirement shall be noted in the improvement plans prior to approval by the City's Public Works Department.*

**Condition of Approval NOI-1:** A 10-foot tall masonry sound wall shall be constructed along the Santa Fe Avenue frontage, adjacent to the proposed residential uses, in order to achieve the City's exterior noise standards. The noise barrier could be constructed with an eight-foot tall sound wall with a two-foot tall earthen berm combination, or a nine-foot tall sound wall with a one-foot tall earthen berm combination, if preferred. Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. Figure 16 of the IS/MND shows the recommended sound wall location.

**Condition of Approval NOI-2:** For the first two rows of lots adjacent to the Santa Fe Avenue right of way, second floor exterior facades facing parallel or perpendicular to Santa Fe Avenue shall be constructed of minimum one-coat stucco with 5/8" interior gypsum hung on a resilient channel and glazing having a minimum sound transmission class (STC) rating of 45 at bedrooms and STC 40 for other rooms. First floor facades of the same two rows of lots adjacent to the Santa Fe Avenue shall be required to have minimum one-coat stucco with STC 33 glazing. Facades facing away from Santa Fe Avenue would likely not require these measures. Due to the high level of exterior noise exposure, and the variability of materials having similar STC ratings, the applicant shall provide a detailed analysis of interior noise control measures once building plans become available. The analysis shall be prepared by a qualified noise control engineer and shall outline the specific measures required to meet the City's 45 dBA  $L_{dn}$  interior noise level standard, as well as the City's maximum ( $L_{max}$ ) noise standard of 50 dB in bedroom and 55 dB in other rooms. The interior noise control analysis shall be reviewed by City staff and the recommendations shall be incorporated into the project building plans.

*Mechanical ventilation shall be provided for all units to allow occupants to keep doors and windows closed for acoustic isolation. Figure 16 shows the recommended interior noise control measures.*

*These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. The detailed analysis shall be submitted to the City's Public Works Department for review and approval.*

**Mitigation Measure NOI-2:** Any compaction required less than 26 feet from the adjacent residential structures shall be accomplished by using static drum rollers, which use weight instead of vibrations to achieve soil compaction. As an alternative to this requirement, pre-construction crack documentation and construction vibration monitoring shall be conducted to ensure that construction vibrations do not cause damage to any adjacent structures. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department.

#### TRIBAL CULTURAL RESOURCES

**Mitigation Measure TRIBAL-1:** If cultural resources are discovered during project-related construction activities, all ground disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery. The archaeologist shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts. If the find is determined by the lead agency in consultation with the Native American tribe traditionally and culturally affiliated with the geographic area of the project site to be a tribal cultural resource and the discovered archaeological resource cannot be avoided, then applicable mitigation measures for the resource shall be discussed with the geographically affiliated tribe. Applicable mitigation measures that also take into account the cultural values and meaning of the

*discovered tribal cultural resource, including confidentiality if requested by the tribe, shall be completed (e.g., preservation in place, data recovery program pursuant to PRC §21083.2[i]). During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project site.*

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## INITIAL STUDY CHECKLIST

### PROJECT TITLE

Parkwood Subdivision

### LEAD AGENCY NAME AND ADDRESS

City of Hughson  
7018 Pine Street (physical)  
P.O. Box 9 (mailing)  
Hughson, CA 95326

### CONTACT PERSON AND PHONE NUMBER

Lea Simvoulakis, Community Development Director  
7018 Pine Street (physical)  
P.O. Box 9 (mailing)  
Hughson, CA 95326  
(209) 883-4054

### PROJECT SPONSOR

DASCO Development  
1117 L Street  
Modesto, CA 95354

### PURPOSE OF THE INITIAL STUDY

An Initial Study (IS) is a preliminary analysis which is prepared to determine the relative environmental impacts associated with a proposed project. It is designed as a measuring mechanism to determine if a project will have a significant adverse effect on the environment, thereby triggering the need to prepare an Environmental Impact Report (EIR). It also functions as an evidentiary document containing information which supports conclusions that the project will not have a significant environmental impact or that the impacts can be mitigated to a "Less Than Significant" or "No Impact" level. If there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, the lead agency shall prepare a Negative Declaration (ND). If the IS identifies potentially significant effects, but: (1) revisions in the project plans or proposals would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and (2) there is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment, then a Mitigated Negative Declaration (MND) shall be prepared.

This IS has been prepared consistent with CEQA Guidelines Section 15063, to determine if the proposed project may have a significant effect upon the environment. Based upon the findings and mitigation measures contained within this report, a MND will be prepared.

### PROJECT BACKGROUND

On August 14, 2006, the City of Hughson City Council adopted a Negative Declaration for the annexation and rezoning of the project area. At the time, no development was proposed within the proposed rezoning and annexation area.

## PROJECT LOCATION AND SETTING

The Parkwood Subdivision Project site (project site) includes approximately 56.04 acres located at the southeastern corner of the Santa Fe Avenue and Hatch Road intersection in the City of Hughson, Stanislaus County. The site is identified by the following Stanislaus County Assessor's Parcel Numbers (APNs): 018-017-002, -010, and -014. The site has previously been used for agricultural and single-family ranchette uses. Orchards are currently located throughout the project site, including mature and young walnut and almond trees. The project site is generally flat at an elevation of approximately 120 to 140 feet above sea level with slopes increasing to the north. See Figures 1 and 2 for the regional location and the project vicinity.

Surrounding uses include a Turlock Irrigation District (TID) Ceres canal, Hatch Road, and agricultural land located in Stanislaus County to the north, single-family residential uses to the east, single-family residential uses to the south, and Santa Fe Avenue, railroad tracks, and agricultural land located in Stanislaus County to the west. See Figure 3 for an aerial view of the project area. As shown in Figure 3, the project site includes two areas adjacent to the project site that are not a part of the site: a Jehovah's Witness Kingdom Hall located to the northwest of the site, and two existing single-family homes with associated garages and buildings located to the north of the site, south of the TID Ceres canal.

## PROJECT DESCRIPTION

The proposed project includes the subdivision of the approximately 56.04-acre site into 299 single-family residential lots with one single-family home per lot. The lots would range in size from 5,005 to 13,280 square feet (sf). The project also includes development of 6.14 acres of park/dual use facilities. Additionally, the project would include development of circulation and utility infrastructure improvements. The project site plan is shown on Figure 4. Each project component is discussed in detail below.

### *RESIDENTIAL*

The proposed project includes two distinct lot layouts for the residential component: "Park Home Lots", which would include traditional residential lots of approximately 5,005 sf to 13,280 sf, and "Courtyard Home Lots", which would include lots of approximately 5,250 sf with a shared driveway (motor court) between a cluster of lots. The project would include 99 Park Homes and 200 Courtyard Homes. Exterior design features for the proposed homes would include porches, shutters, roof articulations, and other architectural detailing. Each home would include driveways and a two-car garage.

### *PARKS AND LANDSCAPING*

The project includes two common space areas totaling 6.14 acres: one in the eastern portion of the subdivision, and one in the western portion of the subdivision. The eastern park area will include street, signature, accent, and shade trees, a neighborhood connecting path, children's play equipment, turn mounding and seat walls, terraced grass seating with barbecue tables, and open turf social space. The western park area will include street, accent, and shade trees, a neighborhood connecting path, children's playground equipment, a tennis court, a basketball court, a pickleball court, a gazebo, and open turf social space.

The proposed project will include a masonry wall and landscaping along Santa Fe Avenue (consistent with the existing subdivision to the south of the site), as well as a decorative entry monument. A masonry wall and landscaping will also be provided along the Hatch Road portion

of the project area. Additionally, a paved bike and walking/jogging path (Class I Bike Trail) would be provided along the TID Ceres canal.

#### *INFRASTRUCTURE AND ACCESS*

The project would be served by existing City water, sewer, and storm drainage infrastructure. The existing City laterals and lines currently located in Hatch Road and Santa Fe Avenue would be extended into the project site. As discussed above, the project includes two park/dual use areas: one in the eastern portion of the subdivision (1.33 acres), and one in the western portion of the subdivision (3.20 acres). These two park areas would also grass retention basin areas for storm drain purposes.

Street improvements primarily consist of the construction of internal local streets throughout the project site, as well as three access points. The three proposed entry monuments include: one off of Santa Fe Avenue on the western site boundary (primary), one off of Flora Vista Drive on the southern site boundary (secondary), and one off of Estancia Drive on the southern site boundary (secondary). Each entry monument would include signage, landscaped medians, and landscape trees. Additionally, the project would provide a total of 1,674 parking spaces, including 1,219 off-street parking spaces and 455 on-street parking spaces.

#### *GENERAL PLAN AND ZONING DESIGNATIONS*

The existing and proposed General Plan and zoning designations for the site are discussed in detail below.

**General Plan:** The project site is currently designated Low Density Residential (LDR) (approximately 19.28 acres), Medium Density Residential (MDR) (approximately 17.73 acres), and Service Commercial (SC) (approximately 19.00 acres) by the City's General Plan land use map. The proposed project would require a General Plan Amendment to change the LDR and SC land uses to MDR. The MDR designation promotes a mixture of single-family houses, duplexes, triplexes, fourplexes and townhouses within the same neighborhood. This category is designed to provide a transition between higher density multi-family and commercial development and low density, single family neighborhoods. The designation also ensures that there will be a variety of housing types in Hughson, which is consistent with the traditional character of the community. Allowable densities range from 5.1 to 14.0 dwelling units per gross acre. The maximum density may be increased by up to 25 percent under the Planned Development process, as part of legally-required affordable density bonuses. With 299 units on 56.04 acres, the proposed density would be 5.34 dwelling units per acre, which is within the allowed density range.

**Zoning:** The project site is currently zoned Single-Family Residential (R-1) (approximately 19.28 acres), Medium Density Residential (R-2) (approximately 17.73 acres), and General Commercial (C-2) (approximately 19.00 acres) by the City's zoning map. The proposed project would require a rezone to change the R-1 and C-2 land uses to R-2. The purpose of the R-2 medium density residential zone is to provide living areas where a compatible mixture of single-family, duplex, triplex, fourplex and townhouse housing will provide a suitable environment for family living; to ensure adequate light, air, privacy and open space for each dwelling; to provide space for community facilities needed to complement urban residential areas and for institutions which require a residential environment.

The project would also include a Planned Development overlay zone which would allow for reduced setbacks and design flexibility. The Planned Development overlay zone would be subject to a Conditional Use Permit.

The existing General Plan and zoning designations are shown on Figure 5. The proposed General Plan and zoning designations are shown on Figure 6.

### **REQUESTED ENTITLEMENTS AND OTHER APPROVALS**

The City of Hughson is the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

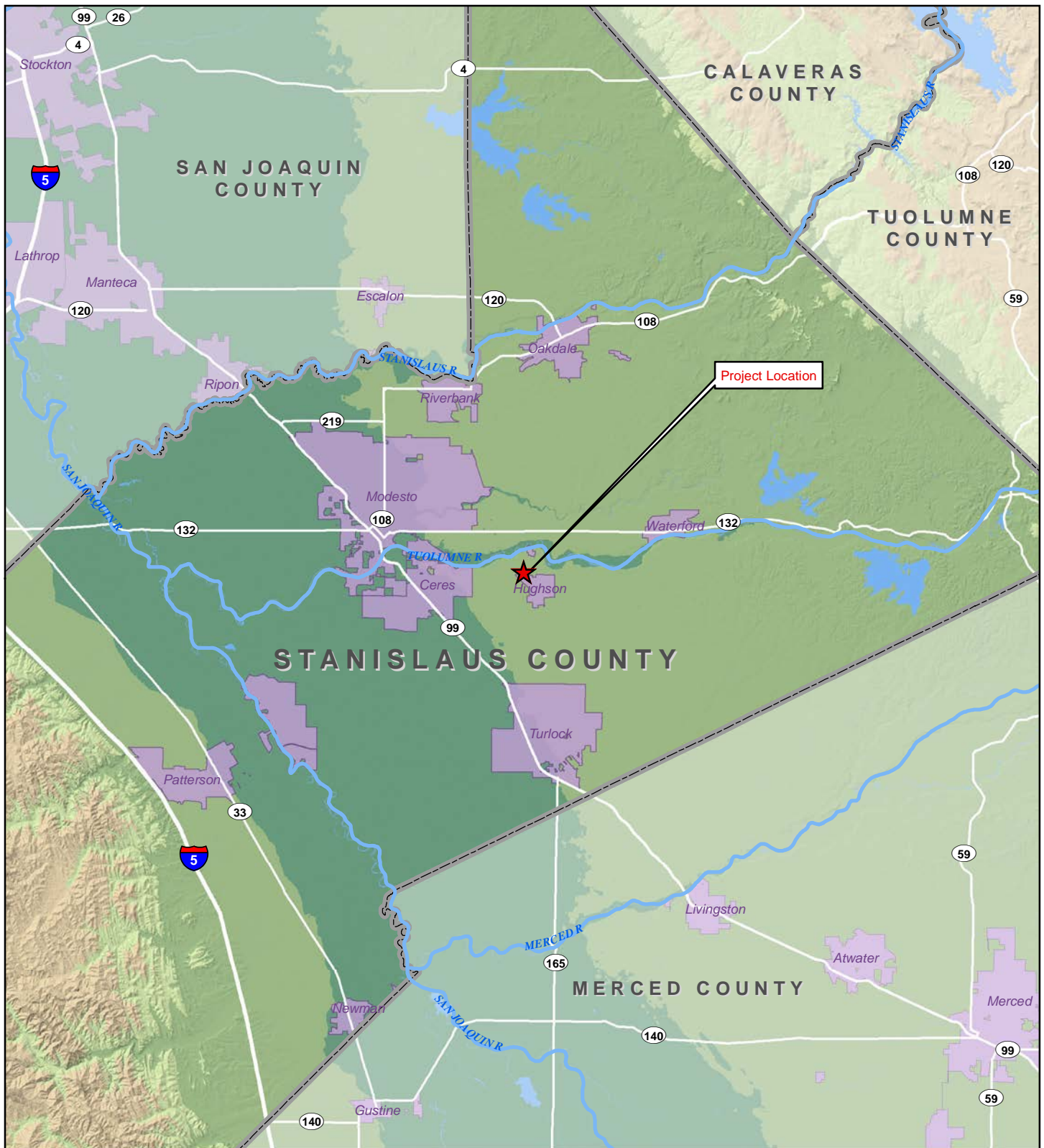
This document will be used by the City of Hughson to take the following actions:

- Adoption of the Mitigated Negative Declaration (MND);
- Adoption of the Mitigation Monitoring and Reporting Program (MMRP);
- Approval of a General Plan Amendment from LDR and SC to MDR;
- Approval of a zone change from R-1 and C-2 to R-2;
- Approval of a Conditional Use Permit to create a Planned Development Overlay Zone to allow for reduced setbacks and design flexibility;
- Approval of a Tentative Subdivision Map to subdivide approximately 56.04 acres into 299 single-family residential lots;
- Design Review of the proposed structures.

The following agencies may be required to issue permits or approve certain aspects of the proposed project:

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- RWQCB – The Storm Water Pollution Prevention Plan (SWPPP) would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) – Approval of construction-related air quality permits.





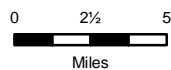
### Legend



Project Location



County Boundary



**CITY OF HUGHSON  
PARKWOOD SUBDIVISION**

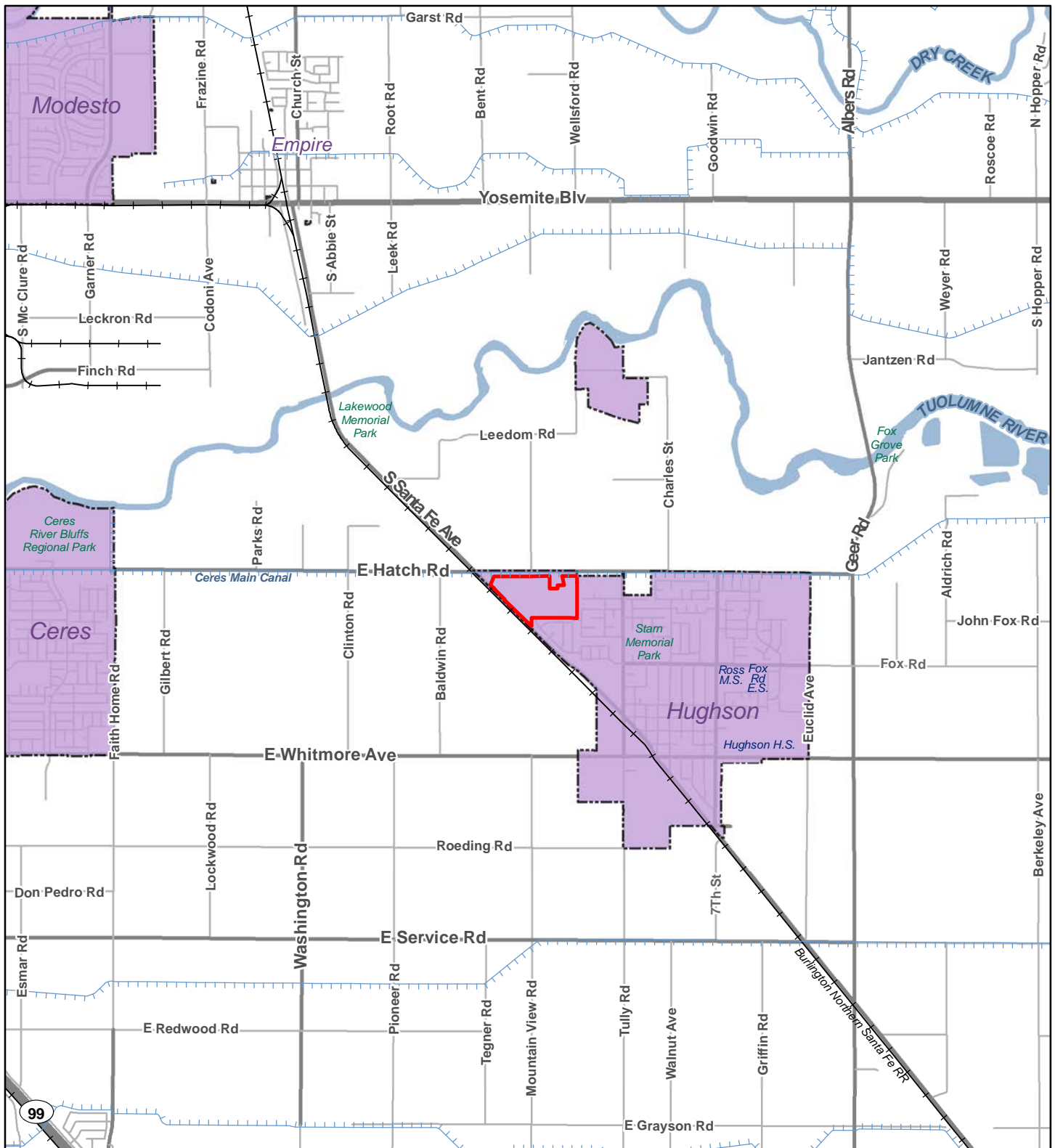
**Figure 1. Regional Location Map**

Sources: CalAtlas; San Joaquin, Stanislaus, Madera  
Counties; CalAtlas. Map date: March 27, 2019.

De Novo Planning Group  
A Land Use Planning, Design, and Environmental Firm

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**Legend**

- Project Boundary
- City Area
- Canal
- River
- Railroad

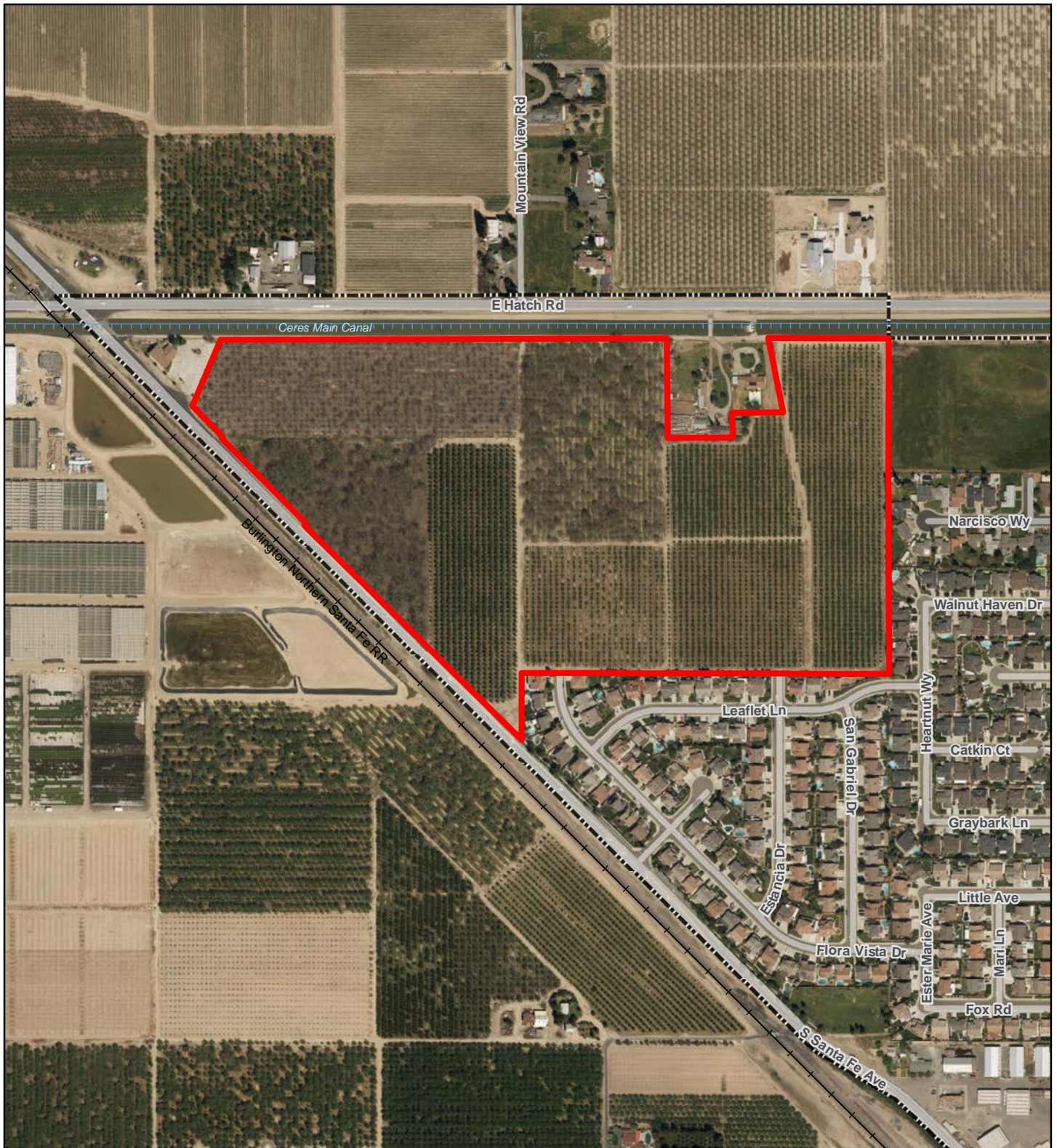


**CITY OF HUGHSON  
PARKWOOD SUBDIVISION**

**Figure 2. Project Vicinity**

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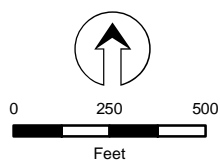




### Legend

- Project Boundary
- Hughson City Boundary
- ||||| Canal
- +—+—+— Railroad

Sources: Stanislaus County; CalAtlas; ArcGIS Online  
World Imagery Map Service. Map date: March 27, 2019.



### CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 3. Aerial View of Project Site

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## LAND USE DATA

Lot Count : 299 Single Family Residential (SFR) Lots

*Park Home Lot Size: 5,005 - 13,280 sf*  
*Courtyard Home Lot Size: 5,250 sf min.*

Project Acreage: 56.04 Gross Acres

Park/Dual Use Facilities: 6.14 Acres

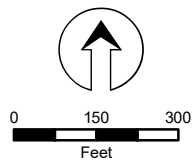
Density Calculation

299 SFR lots / 56.04 Gross Acres = 5.33 D.U./Acres

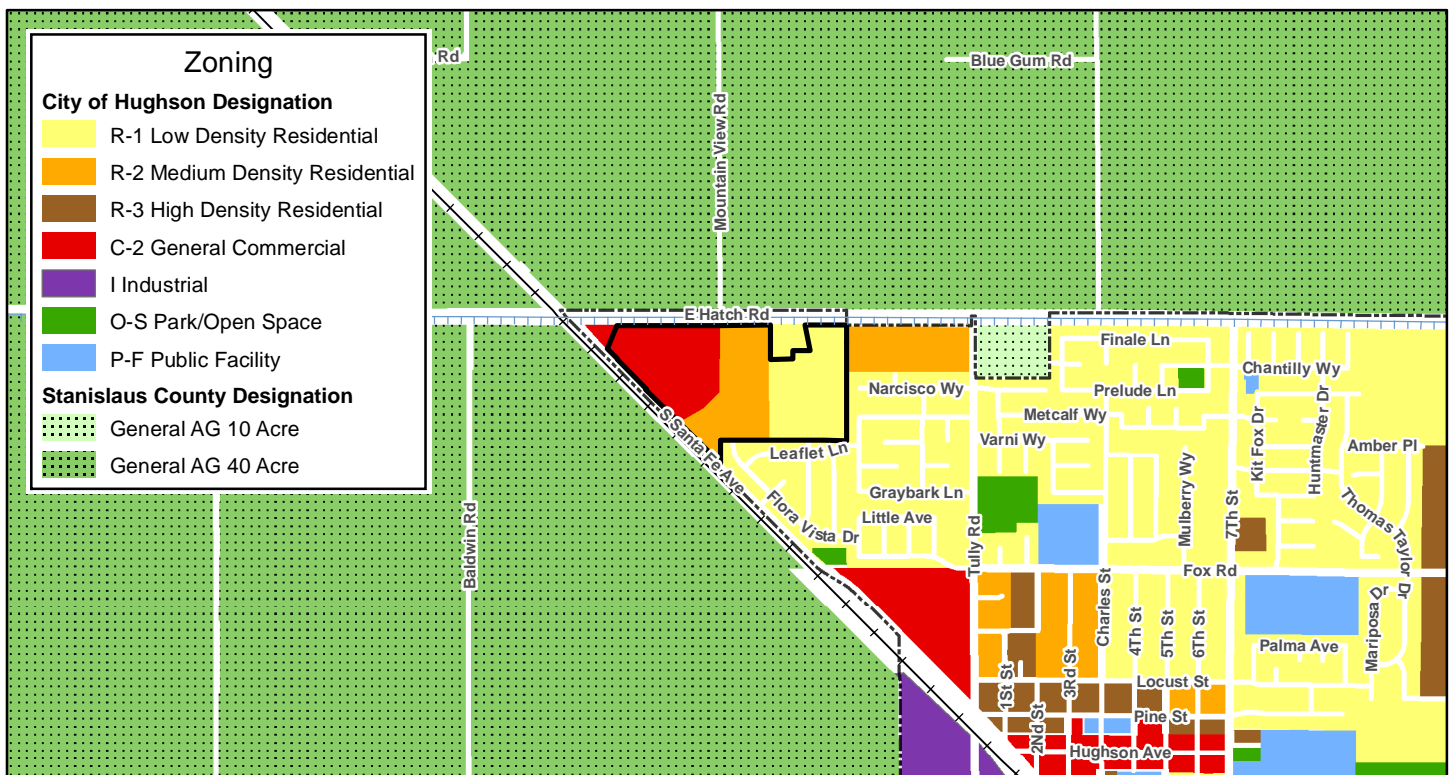
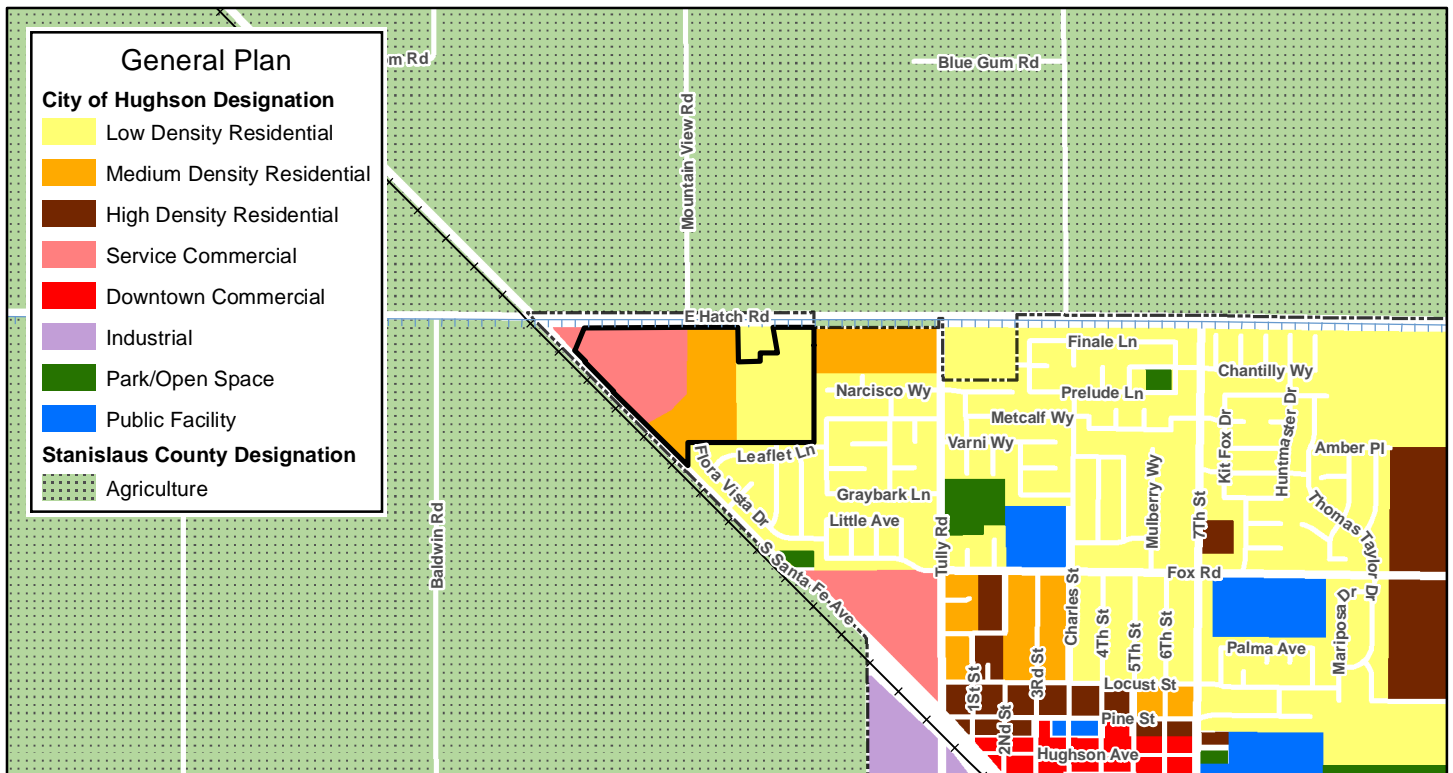


CITY OF HUGHSON  
 PARKWOOD SUBDIVISION

Figure 4. Site Plan

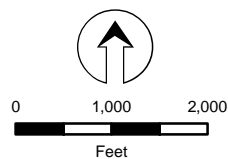


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#### Legend

- Project Boundary
- Hughson City Boundary
- Canal
- Railroad

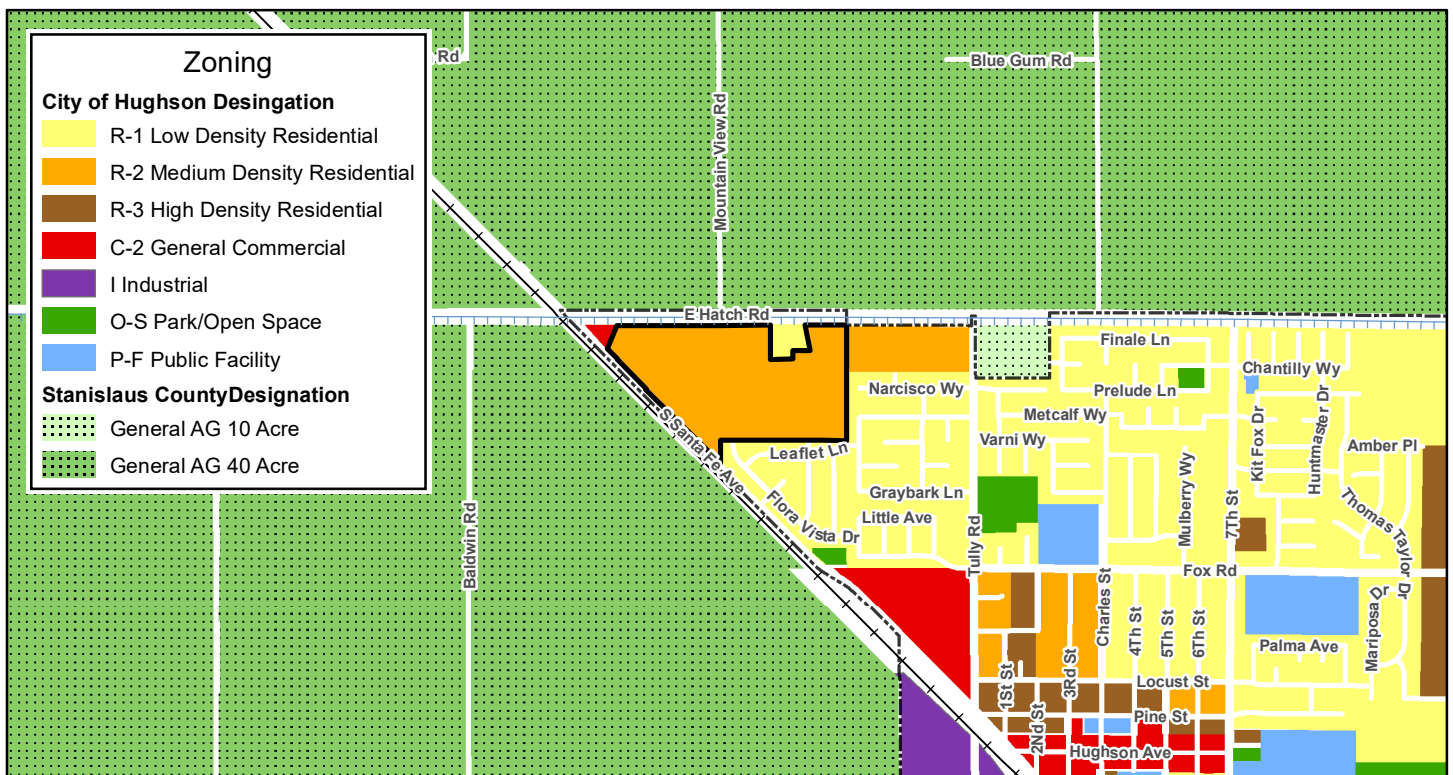
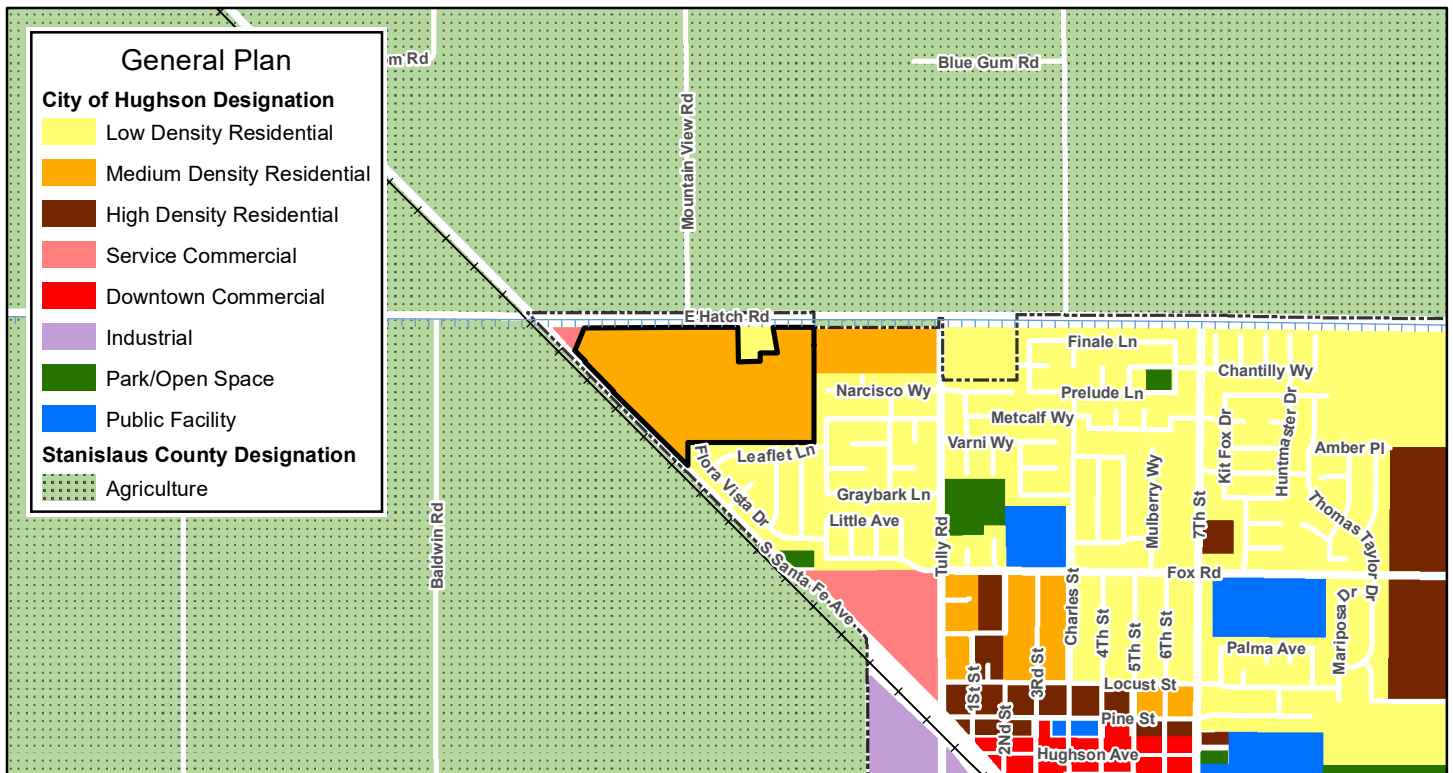


#### CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 5. Existing General Plan and Zoning Maps

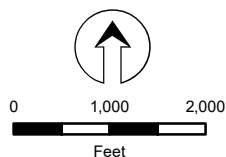
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#### Legend

- Project Boundary
- Hughson City Boundary
- Canal
- Railroad



#### CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 6. Proposed General Plan  
and Zoning Designations

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## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

None of the environmental factors listed below would have potentially significant impacts as a result of development of this project, as described on the following pages.

	Aesthetics		Agriculture and Forestry Resources		Air Quality
	Biological Resources		Cultural Resources		Energy
	Geology and Soils		Greenhouse Gasses		Hazards and Hazardous Materials
	Hydrology and Water Quality		Land Use and Planning		Mineral Resources
	Noise		Population and Housing		Public Services
	Recreation		Transportation		Tribal Cultural Resources
	Utilities and Service Systems		Wildfire		Mandatory Findings of Significance

## DETERMINATION

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (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

## EVALUATION INSTRUCTIONS

- 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 Section XVII, "Earlier Analyses," 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 significant.

## EVALUATION OF ENVIRONMENTAL IMPACTS

In each area of potential impact listed in this section, there are one or more questions which assess the degree of potential environmental effect. A response is provided to each question using one of the four impact evaluation criteria described below. A discussion of the response is also included.

- **Potentially Significant Impact.** This response is appropriate when there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries, upon completion of the Initial Study, an EIR is required.
- **Less than Significant With Mitigation Incorporated.** This response applies when 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.
- **Less than Significant Impact.** A less than significant impact is one which is deemed to have little or no adverse effect on the environment. Mitigation measures are, therefore, not necessary, although they may be recommended to further reduce a minor impact.
- **No Impact.** These issues were either identified as having no impact on the environment, or they are not relevant to the project.

## ENVIRONMENTAL CHECKLIST

This section of the Initial Study incorporates the most current Appendix "G" Environmental Checklist Form contained in the CEQA Guidelines. Impact questions and responses are included in both tabular and narrative formats for each of the 21 environmental topic areas.

### I. AESTHETICS

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

#### *Responses to Checklist Questions*

**Responses a), c):** The City of Hughson General Plan does not specifically designate any scenic viewsheds within the city.

For analysis purposes, a scenic vista can be discussed in terms of a foreground, middleground, and background viewshed. The middleground and background viewshed is often referred to as the broad viewshed. Examples of scenic vistas can include mountain ranges, valleys, ridgelines, or water bodies from a focal point of the forefront of the broad viewshed, such as visually important trees, rocks, or historic buildings. An impact would generally occur if a project would change the view to the middle ground or background elements of the broad viewshed, or remove the visually important trees, rocks, or historic buildings in the foreground.

The proposed project will not significantly disrupt middleground or background views from public viewpoints. The proposed project would result in changes to the foreground views from the public viewpoint by adding single-family residential buildings to a site that is undeveloped.

Upon build-out, the project would be of similar visual character to nearby and adjacent developments. For motorists travelling along nearby roadways, such as Santa Fe Avenue and E. Hatch Road, the project would appear to be a continuation of adjacent residential land uses and would not present unexpected or otherwise unpleasant aesthetic values within the general project vicinity.

The greatest visual change would apply to neighbors that have a direct view of the area, including residences along E. Hatch Road, Flora Vista Drive, Leaflet Lane, Narisco Way, Walnut Haven Drive, and Heartnut Way. Views of the project site are generally visible from immediately adjacent residences, but are obscured by existing fencing and landscaping. Upon development of the project, landscaping would be provided throughout the project site. The proposed landscaping includes a variety of plants and support materials at varying heights that would provide some shielding from existing residences in the vicinity.

The change in character of the project site, once developed, is anticipated by the General Plan and would be visually compatible with surrounding existing residential uses to the west and south. Setbacks, fencing, and landscaping around the perimeter of the site will buffer the foreground viewshed from residents in the immediate vicinity. Therefore, implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** The project site is not located within view of a state scenic highway. Only one highway section in Stanislaus County is listed as a Designated Scenic Highway by the Caltrans Scenic Highway Mapping System; the segment of Interstate 5 (I-5) from the San Joaquin to Merced County lines. Views from this route are primarily agricultural with distant views of the Coast Range. The City of Hughson and the project site are not visible from this roadway segment. Therefore, the proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Implementation of the proposed project would have ***no impact*** relative to this topic.

**Response d):** The project site is undeveloped and contains orchards throughout the site. The site does not contain existing lighting. Adjacent lighting includes street lighting along E. Hatch Road, Santa Fe Avenue, and the adjacent residential streets to the west and south, as well as parking lighting at the Jehovah's Witness Kingdom Hall. There is a potential for the proposed project to create new sources of light and glare. Examples of lighting would include construction lighting, street lighting, security lighting along sidewalks, exterior building lighting, interior building lighting, and automobile lighting. Examples of glare would include reflective building materials and automobiles.

There is a potential for the implementation of the proposed project to introduce new sources of light and glare into the project area. Contributors to light and glare impacts would include construction lighting and street lighting that would create ongoing light impacts to the area. Nighttime construction activities are not anticipated to be required as part of on-site roadway construction. Operational light sources from street lighting may be required to provide for safe travel. All street lighting would have to comply with the City of Hughson outdoor lighting standards. Section 17.03.056 of the Hughson Municipal Code identifies general lighting standards for light shielding, illumination levels, energy-saving, and nuisance prevention. Therefore, implementation of the proposed project would have a ***less than significant*** impact relative to this topic.



## II. AGRICULTURE AND FORESTRY RESOURCES

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			X	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526)?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?		X		

### *Responses to Checklist Questions*

**Response a):** As shown in Figure 7, the majority of the project site is designated Prime Farmland as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. A portion of the site along the northern boundary is designated Urban and Built-Up Land. The proposed project would result in the conversion of this designated Prime Farmland land to a non-agricultural use.

The proposed project will convert Prime Farmland to single-family residential uses. However, the project site is designated as LDR, MDR, and SC by the Hughson General Plan Land Use Map. The Hughson General Plan EIR anticipated development of the project site as part of the overall evaluation of the build out of the City. The General Plan EIR addressed the conversion and loss of agricultural land that would result from the build out of the General Plan (General Plan 2023 Draft EIR, pp. 4.2-1 through 4.2-15). The General Plan EIR determined that even with the implementation of the General Plan goals, policies, and actions (including, but not limited to, Goal COS-1, Actions LU-1.2, COS-1.2, and COS-1.3, and Policies COS-1.1, COS-1.3, COS-1.6, COS-1.7), the impact would be significant and unavoidable. The City subsequently adopted a Statement of Overriding Consideration and certified the General Plan EIR. The proposed project is generally consistent with the General Plan.

Because conversion of the project site from agricultural to urban uses was previously analyzed in the City's General Plan EIR, implementation of the proposed project would have a ***less than significant*** impact relative to this issue.

**Response b):** The project site is not zoned for agricultural use nor is it under a Williamson Act contract. The proposed project would not conflict with existing zoning for agricultural use, or a



Williamson Act contract. Implementation of the proposed project would have **no impact** relative to this issue.

**Response c):** The project site is not forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526). The proposed project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland. Implementation of the proposed project would have **no impact** relative to this issue.

**Response d):** The project site is not forest land. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. Implementation of the proposed project would have **no impact** relative to this issue.

**Response e):** The project site is currently undeveloped and contains orchard uses. The site does not contain forest land, and forest land is not located in the vicinity of the site. The site has previously been used for agricultural purposes. The lands adjacent to the site contain religious uses and residential uses. The agricultural land located west of the site, opposite Santa Fe Avenue, is designated mainly Vacant or Disturbed Land, with some Prime Farmland located west of the southwestern corner of the site (see Figure 7). The land to the east is designated for Agriculture by the Stanislaus County General Plan land use map. In order to ensure that development of the site does not result in conversion of the portion of Prime Farmland located west of the southwestern corner of the site to non-agricultural use, the project would be subject to the City's Right to Farm Ordinance. Section 17.03.064 of the Hughson Municipal Code outlines the Right to Farm Ordinance, including nuisances, deed restrictions, and notification to buyers.

The project will comply with the City's Right to Farm Ordinance (as required by Mitigation Measure AG-1). Because conversion of the project site from agricultural to urban uses was analyzed in the City's General Plan EIR, and because the project will be subject to the Right to Farm Ordinance, implementation of the proposed project would have a **less than significant** impact relative to this issue.

#### *Mitigation Measure(s)*

**Mitigation Measure AG-1:** *Prior to approval of the Tentative Map for the project, the project applicant shall comply with the City's Right to Farm Ordinance (Section 17.03.064 of the Municipal Code). In order to comply, the following deed restriction shall be recorded by the owners and run with the land:*

#### *"RIGHT TO FARM DEED RESTRICTION*

*Properly conducted agricultural operations are permitted within Stanislaus County, within the City of Hughson, and its Sphere of Influence. You are hereby notified that the property you are purchasing is in an agricultural area. You may be subject to inconvenience or discomfort from lawful agricultural or agricultural processing facilities operations. Discomfort and inconvenience may include, but are not limited to, noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents and/or the operations of machinery (including aircraft) during any 24 hour period. One or more of the inconveniences described may occur as a result of agricultural operations which are in compliance with existing laws and regulations and accepted customs and standards. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomfort as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. Lawful ground rig or aerial application of pesticides, herbicides and fertilizers occur in farming operations. Should you be concerned about spraying, you may contact the Stanislaus County Agricultural Commission.*

*The City of Hughson Right to Farm Ordinance does not exempt farmers, agricultural processors or others from compliance with law. Should a farmer, agricultural processor or other person not comply with appropriate State, federal or local laws, legal recourse is possible by, among other ways, contacting the appropriate agency. This Right to Farm Deed Restriction shall be included in all subsequent deeds and leases for this property until such time as the City Council shall determine that such a restriction is no longer necessary."*

*Additionally, every transferor of property subject to the notice recorded pursuant to subsection C of Section 17.03.064 shall provide to any transferee in writing the notice of right to farm recited below. The notice of right to farm shall be contained in each offer for sale, counter offer for sale, agreement of sale, lease, lease with an option to purchase, deposit receipt, exchange agreement, rental agreement, or any other form of agreement or contract for the transfer of property; provided, that the notice need be given only once in any transaction. The transferor shall acknowledge delivery of the notice and the transferee shall acknowledge receipt of the notice.*

*The form of notice of right to farm is as follows:*

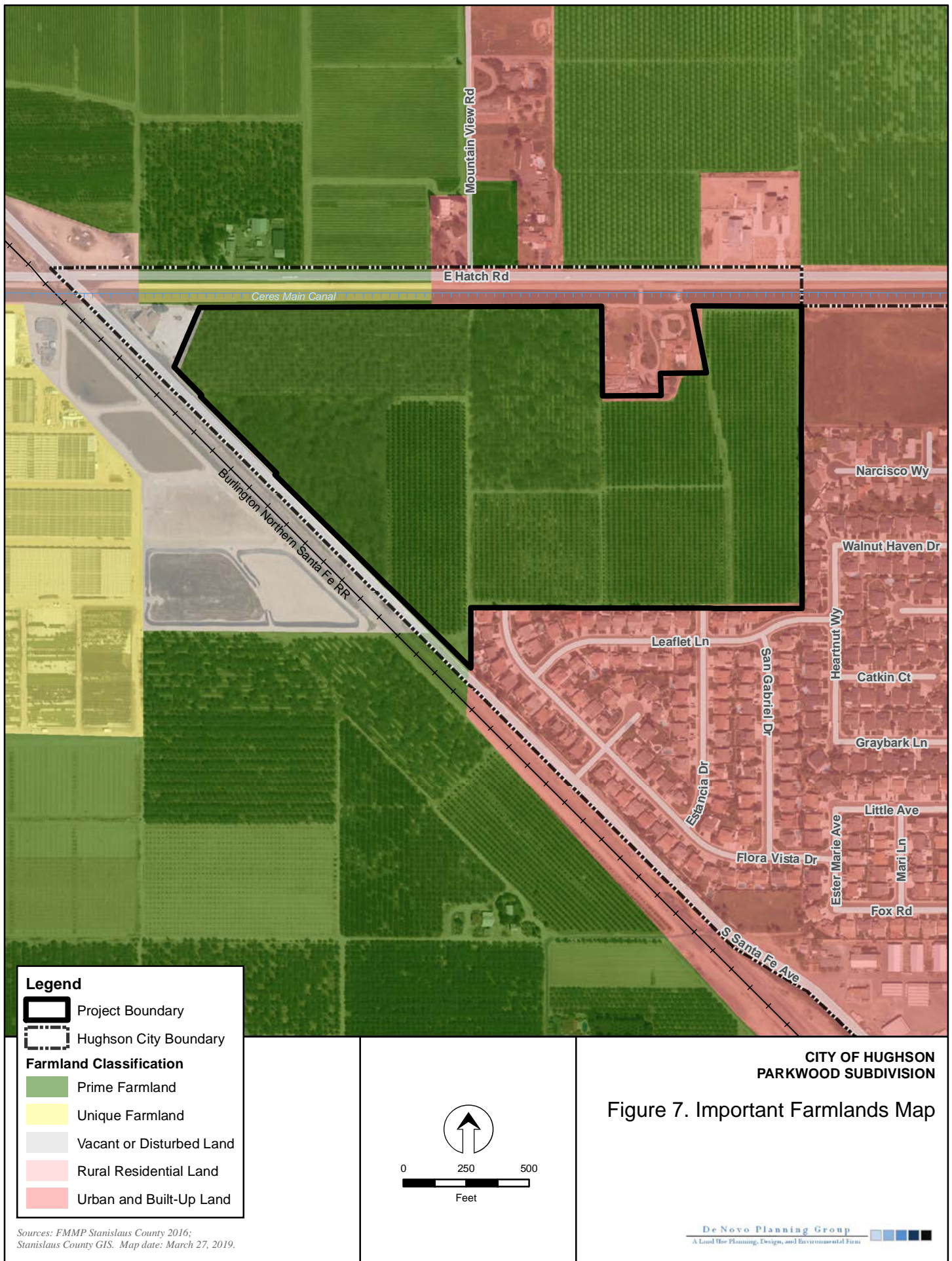
**"NOTICE OF RIGHT TO FARM**

*Properly conducted agricultural operations are permitted within Stanislaus County and within the City of Hughson Sphere of Influence. You are hereby notified that the property you are purchasing/leasing/renting is in an agricultural area. You may be subject to inconvenience or discomfort from lawful agricultural or agricultural processing facilities operations. Discomfort and inconvenience may include, but are not limited to, noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents and/or the operation of machinery (including aircraft) during any 24 hour period. One or more of the inconveniences described may occur as a result of agricultural operations which are in compliance with existing laws and regulations and accepted customs and standards. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomfort as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. Lawful ground rig or aerial application of pesticides, herbicides and fertilizers occur in farming operations. Should you be concerned about spraying, you may contact the Stanislaus County Agricultural Commission.*

*The City of Hughson Right to Farm Ordinance does not exempt farmers, agricultural processors or others from compliance with law. Should a farmer, agricultural processor or other person not comply with appropriate state, federal or local laws, legal recourse is possible by, among other ways, contacting the appropriate agency. This notification is given in compliance with Hughson Municipal Code Section 17.03.064. By initialing below, you are acknowledging receipt of this notification.*

\_\_\_\_\_  
*Transferor's Initials*

\_\_\_\_\_  
*Transferee's Initials"*



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### III. AIR QUALITY

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Conflict with or obstruct implementation of the applicable air quality plan?		X		
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?		X		
c) Expose sensitive receptors to substantial pollutant concentrations?			X	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

#### *Existing Setting*

The project site is located within the San Joaquin Valley Air Pollution Control District (SJVAPCD). This agency is responsible for monitoring air pollution levels and ensuring compliance with federal and state air quality regulations within the San Joaquin Valley Air Basin (SJVAB) and has jurisdiction over most air quality matters within its borders.

The SJVAPCD has primary responsibility for compliance with both the federal and state standards and for ensuring that air quality conditions are maintained. They do this through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

The SJVAPCD has prepared the *2007 Ozone Plan* to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone. The *2007 Ozone Plan* provides a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the SJVAB. The *2007 Ozone Plan* calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution. The *2007 Ozone Plan* calls for a 75-percent reduction in ozone-forming oxides of nitrogen emissions.

The SJVAPCD has also prepared the *2007 PM<sub>10</sub> Maintenance Plan and Request for Redesignation* (2007 PM<sub>10</sub> Plan). On April 24, 2006, the SJVAPCD submitted a Request for Determination of PM<sub>10</sub> Attainment for the Basin to the California Air Resources Board (CARB). CARB concurred with the request and submitted the request to the U.S. Environmental Protection Agency (EPA) on May 8, 2006. On October 30, 2006, the EPA issued a Final Rule determining that the Basin had attained the National Ambient Air Quality Standards (NAAQS) for PM<sub>10</sub>. However, the EPA noted that the

Final Rule did not constitute a redesignation to attainment until all of the Federal Clean Air Act requirements under Section 107(d)(3) were met.

The SJVAPCD has prepared the *2008 PM<sub>2.5</sub> Plan* to achieve Federal and State standards for improved air quality in the San Joaquin Valley Air Basin. The *2008 PM<sub>2.5</sub> Plan* provides a comprehensive list of regulatory and incentive-based measures to reduce PM<sub>2.5</sub>.

In addition to the *2007 Ozone Plan*, the *2008 PM<sub>2.5</sub> Plan*, and the *2007 PM<sub>10</sub> Plan*, the SJVAPCD prepared the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI). The GAMAQI is an advisory document that provides Lead Agencies, consultants, and project applicants with analysis guidance and uniform procedures for addressing air quality impacts in environmental documents. Local jurisdictions are not required to utilize the methodology outlined therein. This document describes the criteria that SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts. An update of the GAMAQI was approved on March 19, 2015, and is used as a guidance document for this analysis.

### *Responses to Checklist Questions*

#### **Responses a), b):**

#### **Air Quality Plan Consistency**

As discussed below, annual construction emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> will not exceed the SJVAPCD thresholds of significance in any given year. Additionally, annual operational emissions of ROG, PM<sub>2.5</sub>, and PM<sub>10</sub> would not exceed the SJVAPCD thresholds of significance. However, annual operational emissions of NO<sub>x</sub> would exceed the SJVAPCD thresholds of significance.

The SJVAPCD's various air quality plans (i.e., 2007 Ozone Plan, 2007 PM<sub>10</sub> Plan, and 2008 PM<sub>2.5</sub> Plan) includes growth assumptions generated by the Stanislaus Council of Governments (StanCOG). These growth assumptions are generated based, in part, on the development projections from individual land use authorities (i.e. incorporated cities and unincorporated counties) that are located within their region. It is noted that the consistency with the StanCOG population projection is growth that would generate population that is at, or below, the projections established by StanCOG. Any growth above the StanCOG population projection, would be growth that is inconsistent with the StanCOG projections. Any growth that is at, or below, the StanCOG projections would be consistent with the SJCO StanCOG G projections.

The City of Hughson General Plan designates the project site for LDR, MDR, and SC uses. The proposed project is generally consistent with the General Plan and zoning designations for the project site. The City's General Plan designates the project area as LDR (19.28 acres), MDR (17.73 acres), and SC (19.00 acres). Allowable densities in the MDR designation range from 5.1 to 14.0 dwelling units per gross acre. Allowable densities in the LDR designation range from 0.0 to 5.0 dwelling units per gross acre. The maximum allowed intensity of use for the SC designation is a FAR of 0.5. Therefore, the City's General Plan anticipated up to 344 residential units (with an associated population of 1,190 persons) and 413,730 square feet of SC within the project area. The analysis included in the City's General Plan EIR assumed that the site would be developed with LDR, MDR, and SC uses. The project would not increase development beyond the level assumed for the site in the City's General Plan EIR. Therefore, the project is generally consistent

with the General Plan and development will remain within (i.e. will not exceed) the StanCOG projections.

Because the proposed project does not exceed the StanCOG projections it is considered to be consistent with the population projections. Therefore, the proposed project would be consistent with the regional air quality plan (i.e., SJVAPCD's 2007 Ozone Plan, 2007 PM<sub>10</sub> Plan, and 2008 PM<sub>2.5</sub> Plan).

### **Cumulative Air Quality Impacts**

As discussed above, the SJVAPCD is an agency responsible for ensuring that air quality conditions are attained, and where non-attainment is determined, this agency develops strategies to achieve attainment in the future. This effort to achieve attainment is documented in the SJVAPCD's various air quality plans (i.e., 2007 Ozone Plan, 2007 PM<sub>10</sub> Plan, and 2008 PM<sub>2.5</sub> Plan), which are updated periodically to accommodate changes. While the scope of the SJVAPCD's strategies to achieve attainment is wide ranging, the agency has established thresholds of significance for individual new projects and if a project exceeds the threshold of significance, then it would also be a significant contribution to a cumulative impact.

The SJVAPCD's air quality significance thresholds represent the maximum emissions from a project that are not expected to conflict with the SJVAPCD's air quality plans, and is not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard. These are developed based on the ambient concentrations of the pollutant for each source. Because the project would not exceed the majority of the air quality significance thresholds on the project-level during construction or operation (as discussed below), and would not otherwise conflict with the SJVAPCD's air quality plans, the cumulative emissions would not be a significant contribution to a cumulative impact.

### **Construction Emissions**

Construction-generated emissions are temporary and short term but have the potential to represent a significant air quality impact. The construction and development of the proposed project would result in the temporary generation of emissions. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities.

The SJVAPCD has adopted guidelines for determining potential adverse impacts to air quality in the region. The SJVAPCD guidelines state that construction activities are considered a potentially significant adverse impact if: the feasible control measures for construction in compliance with Regulation VIII as listed in the SJVAPCD guidelines are not incorporated or implemented; if the project generates emissions of reactive organic gases (ROG) or oxides of nitrogen (NO<sub>x</sub>) that exceeds 10 tons per year; or if the project generates emissions of respirable particulate matter (PM<sub>10</sub>) or fine particulate matter (PM<sub>2.5</sub>) that exceeds 15 tons per year.

Construction Activities/Schedule: CalEEMod default values were used for the construction schedule and off-road equipment. Construction activities will consist of multiple phases over approximately five years. These construction activities can be described as site improvements (grading, underground infrastructure, and topside improvements) and vertical construction (building construction and architectural coatings). For purposes of this analysis, it is assumed that the entire project is built-out from 2020 through 2025. This construction schedule is considered a worst-case scenario.

**Site Improvements:** The exact construction schedule of the entire project is largely dependent on market demands. For purposes of this analysis it is assumed that site improvements are installed in one phase. This approach will present a more conservative and worst-case scenario.

The site improvement phase of construction will begin with site preparation. The site preparation step will include the use of dozers, backhoes, and loaders to strip (clear and grub) all organic materials and the upper half-inch to inch of soil from the project site. This task will generally take less than two months to complete and will include vehicle trips from construction workers. This step would take approximately 40 days.

After the site is striped of organic materials grading will begin. This activity will involve the use of excavators, graders, dozers, scrapers, loaders, and backhoes to move soil around the project site to create specific engineered grade elevations and soil compaction levels. Grading the project site would take approximately 110 days and will include vehicle trips from construction workers. *(Note: It would be possible to grade the site under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment.)*

The last task is to install the topside improvements, which includes pouring concrete curbs, gutters, sidewalks, and access aprons and then paving of all streets and parking lots. This task will involve the use of pavers, paving equipment, and rollers and will take approximately 75 days and will include vehicle trips from construction workers. *(Note: It would be possible to install the topside improvements under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment.)*

**Building Construction/Architectural Coatings:** Building construction involves the vertical construction of structures and landscaping around the structures. This task will involve the use of cranes, forklifts, generator sets, welders, and tractors/loaders/backhoes. The exact construction schedule of the entire project is largely dependent on market demands. For purposes of this analysis it is assumed that the building construction for the entire project is constructed in approximately five years. The actual building construction phase may be much shorter or much longer. Architectural coatings involve the interior and exterior painting associated with the structures. This task will generally begin after construction begins on the structure and will generally be completed with the completion of the individual buildings.

**Construction Emissions:** Using project type and size, 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 is referred to as the SJVAPCD's Small Project Analysis Level (SPAL). The SPAL is broken into two categories – vehicle trips and project type. For residential housing projects, the SPAL by vehicle trips is 1,453 trips per day. For single family housing projects, the SPAL by project type is 390 units. Although the project meets the SPAL by project type (i.e., the project includes fewer than 390 units), the project does not meet the SPAL by vehicle trips (i.e., the project would generate greater than 1,453 trips per day); therefore, a quantification of the emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> that will be emitted by project construction has been performed. CalEEMod™ (v.2016.3.2) was used to estimate construction emissions for the proposed project. Below is a list of model assumptions used in the construction screens of CalEEMod. The CalEEMod assumptions and outputs are included in Appendix A.

Table 1 presents the estimated construction phase schedule, which shows the duration of each construction phase. Table 2 shows the off-road construction equipment used during construction



for each phase. Following these tables are a list of default factors that were used in the model. Table 3 shows the construction emissions for the construction years 2019 through 2025.

**Table 1: Construction Phase**

Phase Number	Phase Name	Start Date	End Date	# Days/Week	# Days
1	Site Preparation	5/16/2020	7/10/2020	5	40
2	Grading	7/11/2020	12/11/2020	5	110
3	Building Construction	12/12/2020	3/14/2025	5	1,110
4	Paving	3/15/2025	6/27/2025	5	75
5	Architectural Coating	6/28/2025	10/10/2025	5	75

SOURCE: CALEEMOD (v. 2016.3.2)

**Table 2: Off-Road Equipment**

Equipment Type	Unit Amount	Hours/Day	Horsepower	Load Factor
<b>Site Preparation</b>				
Rubber Tired Dozers	3	8.00	247	0.40
Tractors/Loaders/Backhoes	4	8.00	97	0.37
<b>Grading</b>				
Excavators	2	8.00	158	0.38
Graders	1	8.00	187	0.41
Rubber Tired Dozers	1	8.00	247	0.40
Scrapers	2	8.00	367	0.48
Tractors/Loaders/Backhoes	2	8.00	97	0.37
<b>Building Construction</b>				
Cranes	1	7.00	231	0.29
Forklifts	3	8.00	89	0.20
Generator Sets	1	8.00	84	0.74
Tractors/Loaders/Backhoes	3	7.00	97	0.37
Welders	1	8.00	46	0.45
<b>Paving</b>				
Pavers	2	8.00	130	0.42
Paving Equipment	2	8.00	131	0.36
Rollers	2	8.00	80	0.38
<b>Architectural Coatings</b>				
Air Compressors	1	6.00	78	0.48

SOURCE: CALEEMOD (v. 2016.3.2)

The SJVAPCD has established construction related emissions thresholds of significance as follows: 10 tons per year of ROG, 10 tons per year of NO<sub>x</sub>, or 15 tons per year of PM<sub>10</sub> or P<sub>2.5</sub>. If the proposed project's emissions will exceed the SJVAPCD's threshold of significance for construction-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions. As shown in Table 3 above, annual emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> will not exceed the SJVAPCD thresholds of significance in any given year. Nevertheless, regardless of emission quantities, the SJVAPCD requires construction related mitigation in accordance with their rules and regulations. Implementation of the following mitigation measures will ensure that the proposed project would reduce construction related emissions to the extent possible. With implementation of the following mitigation measures, the proposed project would have a **less than significant** impact related to construction emissions.

**Table 3: Construction Emissions (Unmitigated)**

<b>Thresholds</b>	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
	<b>≤ 10 tons/year</b>	<b>≤ 10 tons/year</b>	<b>≤ 15 tons/year</b>	<b>≤ 15 tons/year</b>
2020	0.3514	3.7771	1.0292	0.5596
2021	0.3164	2.7713	0.2675	0.1575
2022	0.2849	2.4965	0.2469	0.1385
2023	0.2601	2.2342	0.2319	0.1244
2024	0.2455	2.1225	0.2223	0.1146
2025	5.1426	0.7695	0.0715	0.0404
<b>Maximum</b>	<b>5.1426</b>	<b>3.7771</b>	<b>1.0292</b>	<b>0.5596</b>
<b>Threshold Exceeded in Any Year?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

NOTE: THE AIR DISTRICT IS ATTAINMENT FOR CO AND SO<sub>2</sub>.

SOURCE: CALCEMOD (v. 2016.3.2)

### Mitigation Measure(s)

**Mitigation Measure AIR-1:** Prior to the commencement of construction activities for each phase of the project, the project proponent shall prepare and submit a Dust Control Plan that meets all of the applicable requirements of APCD Rule 8021, Section 6.3, for the review and approval of the APCD Air Pollution Control Officer.

**Mitigation Measure AIR-2:** During all construction activities, the project proponent shall implement dust control measures, as required by APCD Rules 8011-8081, to limit Visible Dust Emissions to 20% opacity or less. Dust control measures shall include application of water or chemical dust suppressants to unpaved roads and graded areas, covering or stabilization of transported bulk materials, prevention of carryout or trackout of soil materials to public roads, limiting the area subject to soil disturbance, construction of wind barriers, access restrictions to inactive sites as required by the applicable rules.

**Mitigation Measure AIR-3:** During all construction activities, the project proponent shall implement the following dust control practices identified in Tables 6-2 and 6-3 of the GAMAQI (San Joaquin Valley APCD, 2002).

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall control fugitive dust emissions by application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. The use

*of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.*

- f. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.*
- g. Limit traffic speeds on unpaved roads to 5 mph; and*
- h. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.*

**Mitigation Measure AIR-4:** Architectural coatings applied to all structures in the project site shall meet or exceed volatile organic compound (VOC) standards set in APCD Rule 4601. The project applicant shall submit to the APCD a list of architectural coatings to be used and shall indicate how the coatings meet or exceed VOC standards. If the APCD determines that any architectural coatings do not meet VOC standards, the project applicant shall replace the identified coatings with those that meet standards.

**Mitigation Measure AIR-5:** Asphalt paving shall be applied in accordance with APCD Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

### **Operational Emissions**

The SJVAPCD is tasked with implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. In that capacity, the SJVAPCD has prepared plans to attain Federal and State ambient air quality standards. To achieve attainment with the standards, the SJVAPCD has established thresholds of significance for criteria pollutant emissions in their *SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts* (2015). Projects with emissions below the thresholds of significance for criteria pollutants would be determined to “Not conflict or obstruct implementation of the District’s air quality plan”.

The proposed project would be a direct and indirect source of air pollution, in that it would generate and attract vehicle trips in the region (mobile source emissions) and it would increase area source emissions and energy consumption. The mobile source emissions would be entirely from vehicles, while the area source emissions would be primarily from the use of natural gas fuel combustion, landscape fuel combustion, consumer products, and architectural coatings.

CalEEMod™ (v.2016.3.2) was used to estimate emissions for buildout of the proposed project. Table 4 shows the emissions, which include mobile, area source, and energy emissions of criteria pollutants that would result from operations of the proposed project.

The CalEEMod assumptions and outputs are included in Appendix A.

**Table 4: Operational Buildout Generated Emissions**

<b>Thresholds</b>	<b>ROG (tons/year)</b>		<b>NO<sub>x</sub> (tons/year)</b>		<b>PM<sub>10</sub> (tons/year)</b>		<b>PM<sub>2.5</sub> (tons/year)</b>	
	<b>≤ 10 tons/year</b>		<b>≤ 10 tons/year</b>		<b>≤ 15 tons/year</b>		<b>≤ 15 tons/year</b>	
<b>Category</b>	<b>UM</b>	<b>M</b>	<b>UM</b>	<b>M</b>	<b>UM</b>	<b>M</b>	<b>UM</b>	<b>M</b>
<b>Area</b>	2.6876	2.6876	0.1375	0.1375	0.0213	0.0213	0.0213	0.0213
<b>Energy</b>	0.0422	0.0422	0.3602	0.3602	0.0291	0.0291	0.0291	0.0291
<b>Mobile</b>	1.0640	1.0339	11.4878	11.1213	3.1673	2.9491	0.8843	0.8236
<b>Total</b>	<b>3.7937</b>	<b>3.7636</b>	<b>11.9855</b>	<b>11.6190</b>	<b>3.2177</b>	<b>2.9996</b>	<b>0.9347</b>	<b>0.8741</b>
<b>Threshold Exceeded?</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
<b>% Reduction</b>	<b>0.79</b>		<b>3.06</b>		<b>6.78</b>		<b>6.49</b>	

NOTES: UM = UNMITIGATED, M = MITIGATED; THE AIR DISTRICT IS IN ATTAINMENT FOR CO, AND SO<sub>2</sub>.

SOURCE: CALHEMOD (v.2016.3.2).

The long-term operational emissions estimate for buildout of the proposed project incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation. The modeling included the following mitigation inputs:

#### Traffic Mitigation

- Project Setting: Low Density Suburban
- Increase Density: 299 du/56.04 ac = 5.34 du/ac
- Increase Destination Accessibility: Distance to Downtown/Job Center is 0.95 miles (from project site to downtown Hughson)
- Increase Transit Accessibility: Distance to Transit is 0.78 miles (Stanislaus Regional Transit [StaRT] Stop 110 at 3rd and Hughson)
- Improve Pedestrian Network: Project Site and Connecting Off-Site (project includes connections from the site to the adjacent residential subdivisions to the south and a multi-se path along the TID canal)

#### Area Mitigation

- Only Natural Gas Hearth (Per SJVAPCD Rule 4901: Wood-Burning Fireplaces and Wood-Burning Heaters, open-hearth fireplaces are not allowed in new construction projects which would result in more than two homes per acre. The proposed project includes more than two homes per acre.)

The SJVAPCD has established their thresholds of significance by which the project emissions are compared against to determine the level of significance. The SJVAPCD has established operations related emissions thresholds of significance as follows: 10 tons per year of NO<sub>x</sub>, 10 tons per year of ROG, 15 tons per year of PM<sub>10</sub>, and 15 tons per year of PM<sub>2.5</sub>. If the proposed project's emissions will exceed the SJVAPCD's threshold of significance for operational-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions to the extent feasible. As shown in Table 4 above, annual emissions of ROG, PM<sub>2.5</sub>, and PM<sub>10</sub> would not exceed the SJVAPCD thresholds of significance. Annual emissions of NO<sub>x</sub> would exceed the SJVAPCD thresholds of significance.

CalHEMOD™ (v.2016.3.2) mitigation assumptions described above were incorporated into the model. With mitigation inputs, annual emissions of NO<sub>x</sub> can be reduced; however, the emissions

would not be reduced to below the thresholds of significance. The NO<sub>x</sub> emissions would exceed the SJVAPCD thresholds of significance for operations even with mitigation. The proposed project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule), which could result in substantial mitigation of emissions beyond what is reflected in the modeling outputs. The reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Rule fee for any required reductions that have not been accomplished through project mitigation commitments. The current fees are \$9,350 per ton of NO<sub>x</sub>, although these are subject to adjustments by the SJVAPCD. The actual calculations will be accomplished by the SJVAPCD and project applicants as the project (i.e., or portions of the project) are brought forward for approval under Rule 9510. However, even with the application of the ISR and the mitigation measures described above, direct emissions levels remain above the defined thresholds of significance for the project as a whole. It is anticipated that with the payment of fees through the ISR, that the SJVAPCD will offset the emissions by implementing projects/programs that reduce emissions.

Although the operational NO<sub>x</sub> emissions would be above the SJVAPCD threshold, the project site was analyzed for LDR, MDR, and SC development as part of the City's General Plan EIR process. The rules for tiering are set forth in CEQA Guidelines Section 15152. "[T]iering is a process by which agencies can adopt programs, plans, policies, or ordinances with EIRs focusing on 'the big picture,' and can then use streamlined CEQA review for individual projects that are consistent with such...[first tier decisions] and are...consistent with local agencies' governing general plans and zoning.'" (*Koster v. County of San Joaquin* (1996) 47 Cal.App.4th 29, 36.) Section 15152 provides that, where a first-tier EIR has "adequately addressed" the subject of cumulative impacts, such impacts need not be revisited in second- and third-tier documents. Furthermore, second- and third-tier documents may limit the examination of impacts to those that "were not examined as significant effects" in the prior EIR or "[a]re susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means." In general, significant environmental effects have been "adequately addressed" if the lead agency determines that:

- a) they have been mitigated or avoided as a result of the prior environmental impact report and findings adopted in connection with that prior environmental impact report; or
- b) they have been examined at a sufficient level of detail in the prior environmental impact report to enable those effects to be mitigated or avoided by site specific revisions, the imposition of conditions, or by other means in connection with the approval of the later project.

Because the City's General Plan EIR addressed the effects of developing the project site with urban uses, environmental review can also be streamlined pursuant to Public Resources Code Section 21083.3 and CEQA Guidelines Section 15183.

The proposed project is generally consistent with the General Plan and zoning designations for the project site. The City's General Plan designates the project area as LDR (19.28 acres), MDR (17.73 acres), and SC (19.00 acres). Allowable densities in the MDR designation range from 5.1 to 14.0 dwelling units per gross acre. Allowable densities in the LDR designation range from 0.0 to 5.0 dwelling units per gross acre. The maximum allowed intensity of use for the SC designation is a FAR of 0.5. Therefore, the City's General Plan anticipated up to 344 residential units (with an associated population of 1,190 persons) and 413,730 square feet of SC within the project area. The analysis included in the City's General Plan EIR assumed that the site would be developed with LDR, MDR, and SC uses. The project would not increase development beyond the level assumed for the site in the City's General Plan EIR.

The Hughson General Plan Draft EIR concludes that implementation of the General Plan would result in a significant and unavoidable impact related to consistency with applicable air quality plans of the SJVAPCD, since population growth that could occur under the 2005 General Plan would exceed that projected by the Stanislaus Council of Governments (StanCOG) and used in projections for air quality planning. The projected growth would lead to an increase in the region's VMT, beyond that anticipated in the SJVAPCD's clean air planning efforts. The increase in VMT that would occur under the General Plan, relative to that projected by StanCOG, is less than one percent. It is noted that the project's operational NO<sub>x</sub> emissions are the highest in the mobile category. The City of Hughson certified the Hughson General Plan Draft EIR, adopted a statement of overriding considerations relative to this significant and unavoidable impact, and approved the General Plan. As such, the operational NO<sub>x</sub> emission resulting from operation of the proposed project were previously considered by the City as part of the General Plan and General Plan EIR planning efforts.

As noted above, design elements and compliance with District rules and regulations may not be sufficient to reduce project related impacts on air quality to a less than significant level. In such situations, the *SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts* (February 2015) indicates that the project proponents may enter into a Voluntary Emission Reduction Agreement (VERA) with the SJVAPCD. A VERA is a method by which the project proponent provides pound-for-pound mitigation of air emissions increases through a process that develops, funds, and implements emission reduction projects, with the District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. To implement a VERA, the project proponent and the District enter into a contractual agreement in which the project proponent agrees to mitigate project specific emissions by providing funds for the District's Emission Reduction Incentive Program (ERIP). The funds are disbursed by ERIP in the form of grants for projects that achieve emission reductions. Thus, project specific impacts on air quality are offset. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors.

In implementing a VERA, the SJVAPCD verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. The initial agreement is generally based on the projected maximum emissions increases as calculated by a SJVAPCD approved air quality impact assessment, and contains the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the SJVAPCD has designed flexibility into the VERA such that the final mitigation is based on actual emissions related to the project as determined by actual equipment used, hours of operation, etc. After the project is mitigated, the SJVAPCD certifies to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project specific emissions have been mitigated.

By its definition, the VERA is a voluntary program initiated by the SJVAPCD to help reduce project-related emissions. The mitigation measure also requires consideration of the benefits of improved air quality with the costs of implementation in the decision making process. Because a VERA is a voluntary program that requires the applicant and the SJVAPCD to agree on a negotiated contractual agreement, a VERA is not considered an enforceable mitigation measures as it provides no specific details or measures that can be mandated at this time. The project applicant retains the option to implement a VERA as a way of reducing emissions in addition to Rule 9510.



## Conclusion

Annual construction emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> will not exceed the SJVAPCD thresholds of significance in any given year. The operational NO<sub>x</sub> emissions would exceed the SJVAPCD thresholds of significance for operations even with mitigation. The proposed project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule), which could result in a substantial reduction of emissions beyond what is reflected in the modeling outputs. Compliance with Rule 9510 is required by Mitigation Measure AIR-6.

Additionally, the project would not increase development beyond the level assumed for the site in the City's General Plan EIR. As such, the operational NO<sub>x</sub> emission resulting from operation of the proposed project were previously considered by the City as part of the General Plan and General Plan EIR planning efforts. With implementation of the mitigation measures included in this section, this impact would be ***less than significant***.

### *Mitigation Measure(s)*

***Mitigation Measure AIR-6:*** Prior to final approval of improvement plans for each phase of the project, the project proponent shall submit an Air Impact Assessment (AIA) application to the San Joaquin Valley Air Pollution Control District for District Rule 9510 Indirect Source Review (ISR) to obtain AIA approval from the District for the phase or project component that is to be constructed. Prior to the issuance of a building permit of each individual phase or project component, the project proponent shall incorporate mitigation measures into the proposed project and demonstrate compliance with District Rule 9510 including payment of all fees.

## Response c):

### Carbon Monoxide Hotspots

Project traffic would increase concentrations of carbon monoxide along streets providing access to the project site. Carbon monoxide is a local pollutant (i.e., high concentrations are normally only found very near sources). The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations (i.e. hotspots), therefore, are usually only found near areas of high traffic volume and congestion.

The SJVAPCD recommends utilizing a screening approach for analyzing CO concentrations to determine if dispersion modeling is warranted. The methodology provides lead agencies with a conservative indication of whether project-generated vehicle trips will result in the generation of CO emissions that contribute to an exceedance of the thresholds of significance. The recommended screening criteria are divided into two tiers, as described below.

First Tier: The proposed project will result in a less-than-significant impact to air quality for local CO if:

- Traffic generated by the proposed project will not result in deterioration of intersection level of service (LOS) to LOS E or F; and
- The project will not contribute additional traffic to an intersection that already operates at LOS of E or F.

For the proposed project, the first tier is not met because the addition of project trips would degrade operations at some of the study intersections, and the project would contribute traffic to an intersection that is projected to operate at LOS E or F. See Section XVII, Transportation, for more information.

The screening approach requires that if the first tier of screening criteria is not met then the second tier of screening criteria shall be examined.

**Second Tier:** If all of the following criteria are met, the proposed project will result in a less-than-significant impact to air quality for local CO.

- The project will not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- The project will not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air will be substantially limited; and
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average (as identified by the EMFAC or CalEEMod models).

The proposed project screens out under the second tier because it meets all three criteria. First, the intersections that will operate at LOS E or F (discussed in Section XVII), will experience traffic below 31,600 vehicles per day, and much less in the peak hour. The maximum of daily trips is significantly below the 31,600 vehicles per hour threshold. Secondly, these intersections do not include a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway, or other locations where horizontal or vertical mixing of air will be substantially limited. Lastly, the mix of vehicle types at these intersections is not anticipated to be substantially different from the County average. As such, the proposed project screens out satisfactorily under tier 2. Therefore, implementation of the proposed project would have a *less than significant* impact relative to this topic.

### Toxic Air Contaminants

A Toxic Air Contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

The 2007 EPA rule requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an Federal Highway Administration (FHWA) analysis using EPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050. California maintains stricter standards for



clean fuels and emissions compared to the national standards, therefore it is expected that MSAT trends in California will decrease consistent with or more than the U.S. EPA's national projections.

CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (2007) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The CARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 5 provides the CARB minimum separation recommendations on siting sensitive land uses. The proposed project does not include any of the source categories identified in the CARB minimum separation standards.

**Table 5: CARB Minimum Separation Recommendations on Siting Sensitive Land Uses**

<b>Source Category</b>	<b>Advisory Recommendations</b>
Freeways and High-Traffic Roads	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.</li> </ul>
Distribution Centers	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week).</li> <li>• Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.</li> </ul>
Rail Yards	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard.</li> <li>• Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.</li> </ul>
Ports	<ul style="list-style-type: none"> <li>• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the CARB on the status of pending analyses of health risks.</li> </ul>
Refineries	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.</li> </ul>
Chrome Platers	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.</li> </ul>
Dry Cleaners Using Perchloroethylene	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district.</li> <li>• Do not site new sensitive land uses in the same building with perc dry cleaning operations.</li> </ul>
Gasoline Dispensing Facilities	<ul style="list-style-type: none"> <li>• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.</li> </ul>

SOURCE: AIR QUALITY AND LAND USE HANDBOOK: A COMMUNITY HEALTH PERSPECTIVE (CARB 2005).

The proposed project does not include the long-term operation of any other major onsite stationary sources of TACs. In addition, no major stationary sources of TACs have been identified in the immediate vicinity of the project site. Additionally, the project site is not located adjacent to a freeway or high traffic road that is considered a significant source of mobile source air toxics.

Implementation of the proposed project would not be anticipated to result in an increased exposure of sensitive receptors to localized concentrations of TACs that would exceed the relevant standards or thresholds. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Response d):** The proposed project would not generate objectionable odors. People in the immediate vicinity of construction activities may be subject to temporary odors typically associated with construction activities (diesel exhaust, hot asphalt, etc.). However, any odors generated by construction activities would be minor and would be short and temporary in duration.

Examples of facilities that are known producers of operational odors include: Wastewater Treatment Facilities, Chemical Manufacturing, Sanitary Landfill, Fiberglass Manufacturing, Transfer Station, Painting/Coating Operations (e.g. auto body shops), Composting Facility, Food Processing Facility, Petroleum Refinery, Feed Lot/Dairy, Asphalt Batch Plant, and Rendering Plant. If a project would locate receptors and known odor sources in proximity to each other further analysis may be warranted; however, if a project would not locate receptors and known odor sources in proximity to each other, then further analysis is not warranted.

The project does not include any of the aforementioned uses. As such, implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

#### IV. BIOLOGICAL RESOURCES

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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 Game or U.S. Fish and Wildlife Service?		X		
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 Game or US Fish and Wildlife Service?			X	
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?			X	
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?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
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?				X

#### *Regional Setting*

The City of Hughson is located in the western portion of the Great Valley Geomorphic Province of California. The Great Valley Province is a broad structural trough bounded by the tilted block of the Sierra Nevada on the east and the complexly folded and faulted Coast Ranges on the west. The San Joaquin River is located just south and west of the City. This major river drains the Great Valley Province into the San Joaquin Delta to the north, ultimately discharging into the San Francisco Bay to the northwest.

The City of Hughson is located within the San Joaquin Valley Bioregion, which is comprised of Kings County, most of Fresno, Kern, Merced, and Stanislaus counties, and portions of Madera, San Luis Obispo, and Tulare counties. The San Joaquin Valley Bioregion is the third most populous out of ten bioregions in the state, with an estimated 2 million people. The largest cities are Fresno, Bakersfield, Modesto, and Stockton. Interstate 5 and State Route (SR) 99 are the major north-south roads that run the entire length of the bioregion. Habitat in the bioregion includes vernal pools, valley sink scrub and saltbush, freshwater marsh, grasslands, arid plains, orchards, and oak savannah. Historically, millions of acres of wetlands flourished in the bioregion, but stream diversions for irrigation dried all but about five percent. Remnants of the wetland habitats are

protected in this bioregion in publicly owned parks, reserves, and wildlife areas. The bioregion is considered the state's top agricultural producing region with the abundance of fertile soil.

The region has a Mediterranean climate that is subject to cool, wet winters (often blanketed with fog) and hot, dry summers. The average annual precipitation is approximately 13.81 inches. Precipitation occurs as rain most of which falls between the months of November through April, peaking in January at 2.85 inches. The average temperatures range from December lows of 37.5 F to July highs of 94.3 F.

The project site is generally flat at an elevation of approximately 120 to 140 feet above sea level with slopes increasing to the north. Topographic features within the project site include level orchards, the TID Ceres canal, and irrigation ditches/catch basins. There are no rivers, streams, or other natural aquatic habitats on the project site. The orchards are actively maintained during the growing season.

Vegetation on the project site consists of agricultural, ruderal, and landscaping. Because of the active agricultural use, there is very limited natural vegetation on the project site with the exception of the perimeter of the orchard. Common plant species observed in these areas include: wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), softchess (*Bromus hordeaceus*) alfalfa (*Medicago sativa*), Russian thistle (*Salsola tragus*), Italian thistle (*Carduus pycnocephalus*), rough pigweed (*Amaranthus retroflexus*), sunflower (*Helianthus annuus*), tarragon (*Artemisia dracunculus*), coyote brush (*Baccharis pilularis*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), sow thistle (*Sonchus asper*), telegraph weed (*Heterotheca grandiflora*), barley (*Hordeum* sp.), mustard (*Brassica niger*), and heliotrope (*Heliotropium curassavicum*).

Agricultural and ruderal vegetation found on the project site provides habitat for both common and a few special-status wildlife populations. For example, some commonly observed wildlife species in the region include: California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), American killdeer (*Charadrius vociferus*), gopher snake (*Pituophis melanoleucus*), garter snake (*Thamnophis species*), and western fence lizard (*Sceloporus occidentalis*), as well as many native insect species. There are also several bat species in the region. Bats often feed on insects as they fly over agricultural and natural areas.

Locally common and abundant wildlife species are important components of the ecosystem. Due to habitat loss, many of these species must continually adapt to using agricultural, ruderal, and ornamental vegetation for cover, foraging, dispersal, and nesting.

### *Responses to Checklist Questions*

**Response a):** The following discussion is based on a background search of special-status species that are documented in the California Natural Diversity Database (CNDDB), the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants, and the U.S. Fish and Wildlife Service's (USFWS) records of listed endangered and threatened species from the IPAC database. The background search was regional in scope and focused on the documented occurrences within the 12-quadrangle region for the project site (approximately a 15-mile radius). Table 6 provides a list of special-status plants and Table 7 provides a list of special-status animals.

**Table 6: Special-Status Plant Species Which May Occur in Project Area**

<b>Species</b>	<b>Status (Fed./CA/ CNPS)</b>	<b>Habitat and Blooming Period</b>
alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	-/--/1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 0-170 m. March-June.
beaked clarkia <i>Clarkia rostrata</i>	--/--/1B.4	Mesic soils, cismontane woodland, meadows and seeps. April-June.
California alkali grass <i>Puccinellia simplex</i>	--/--/1B.2	Meadows and seeps, chenopod scrub, valley and foothill grasslands, vernal pools. Alkaline, vernal mesic. Sinks, flats, and lake margins. 1-915 m. March-May.
Colusa grass <i>Neostapfia colusana</i>	T/E/1B.1	Vernal pool (adobe, large). May-August.
Delta button-celery <i>Eryngium racemosum</i>	--/E/1B.1	Riparian scrub, seasonally inundated depressions along floodplains on clay soils; below 75 m. June-August.
Greene's tuctoria <i>Tuctoria greenei</i>	E/R/1B.1	Vernal pool. May-July.
hairy Orcutt grass <i>Orcuttia pilosa</i>	E/E/1B.1	Vernal pools. 25-125 m. May-September.
heartscale <i>Atriplex cordulata</i> var. <i>cordulata</i>	--/--/1B.2	Saline or alkaline soils, chenopod scrub, meadows and seeps, valley and foothill grassland (sandy). April-October.
Hoover's calycadenia <i>Calycadenia hooveri</i>	--/--/1B.3	Cismontane woodland, valley and foothill grassland. On exposed, rocky, barren soil. 60-260 m. July-September.
Hoover's spurge <i>Euphorbia hooveri</i>	T/--/1B.2	Vernal pools. Vernal pools on volcanic mudflow or clay substrate. 25-130 m. July-September (October).
lesser saltscale <i>Atriplex minuscula</i>	--/--/1B.1	Chenopod scrub, playas, valley and foothill grassland. In alkali sink and grassland in sandy, alkaline soils. 0-225 m. May-October.
Merced monardella <i>Monardella leucocephala</i>	--/--/1A	Valley and foothill grassland. Known from riverbeds, moist sandy depressions; requires moist subalkaline sands associated with low elevation grassland. 35-100 m. May-August.
prairie wedge grass <i>Sphenopholis obtusata</i>	--/--/2B.2	Mesic soils, cismontane woodland, meadows and seeps. April-June.
San Joaquin Valley Orcutt grass <i>Orcuttia inaequalis</i>	T/E/1B.1	Vernal pool. April-September.
subtle orache <i>Atriplex subtilis</i>	--/--/1B.2	Valley and foothill grassland. June, August-October.
succulent owl's-clover <i>Castilleja campestris</i> var. <i>succulenta</i>	T/E/1B.2	Vernal pools. Moist places, often in acidic soils. 20-705 m. (March) April-May.
vernal pool smallscale <i>Atriplex persistens</i>	--/--/1B.2	Vernal pools. Alkaline vernal pools. 3-115 m. June, August, September, October.

NOTES: CNPS = CALIFORNIA NATIVE PLANT SOCIETY

**FEDERAL**

E = ENDANGERED UNDER THE FEDERAL ENDANGERED SPECIES ACT.

T = THREATENED UNDER THE FEDERAL ENDANGERED SPECIES ACT.

**STATE**

E = ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT.

R = RARE UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

**CALIFORNIA NATIVE PLANT SOCIETY**

1B = RARE, THREATENED, OR ENDANGERED IN CALIFORNIA AND ELSEWHERE.

2 = RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE.

3 = A REVIEW LIST – PLANTS ABOUT WHICH MORE INFORMATION IS NEEDED.

4 = PLANTS OF LIMITED DISTRIBUTION – A WATCH LIST

.1 = SERIOUSLY ENDANGERED IN CALIFORNIA (OVER 80% OF OCCURRENCES THREATENED-HIGH DEGREE AND IMMEDIACY OF THREAT).

.2 = FAIRLY ENDANGERED IN CALIFORNIA (20-80% OCCURRENCES THREATENED).

.3 = NOT VERY ENDANGERED IN CALIFORNIA (&lt;20% OF OCCURRENCES THREATENED).

## Special Status Plant Species

As shown in Table 6, there are 17 special status plants identified as having the potential to occur on the project site based on known occurrences in the region.

Field surveys and habitat evaluations were performed in March 2019, which generally does not coincide with the blooming period; however, the site was essentially void of natural vegetation based on the orchard operations on the project site and there is no possibility for presence of these species.

**Table 7: Special-Status Wildlife and Fish Species Which May Occur in Project Area**

<i>Species</i>	<i>Status (Fed/CA)</i>	<i>Habitat Requirements</i>
<b><i>Invertebrates</i></b>		
California linderiella <i>Linderiella occidentalis</i>	--/--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids.
Crotch bumble bee <i>Bombus crotchii</i>	--/--	Occur in the United States and Baja California in Mexico. Occur primarily in California, Western Desert, and adjacent foothills. Distributed throughout most of southwestern North America. Found within open grasslands and scrub habitats.
molestan blister beetle <i>Lytta molesta</i>	--/--	Distribution of this species is poorly known. Annual grasslands, foothill woodlands or saltbush scrub.
obscure bumble bee <i>Bombus caliginosus</i>	--/--	Occur in Mediterranean California and the Pacific Coast. Found within open grassy prairies and coastal meadows.
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T/--	Stream side habitats below 3,000 feet throughout the Central Valley Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T/--	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County Common in vernal pools; they are also found in sandstone rock outcrop pools.
vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E/--	Shasta County south to Merced County Vernal pools and ephemeral stock ponds.
<b><i>Amphibians</i></b>		
California tiger salamander <i>Ambystoma californiense</i> ( <i>A. tigrinum c.</i> )	T/SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County. Small ponds, lakes, or vernal pools in grass-lands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.
western spadefoot <i>Spea hammondi</i>	--/SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.
<b><i>Birds</i></b>		
burrowing owl <i>Athene cunicularia</i>	BCC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows



<i>Species</i>	<i>Status (Fed/CA)</i>	<i>Habitat Requirements</i>
cackling (=Aleutian Canada) goose <i>Branta canadensis leucopareia</i>	D/--	The entire population winters in Butte Sink, then moves to Los Banos, Modesto, the Delta, and East Bay reservoirs; stages near Crescent City during spring before migrating to breeding grounds. Roosts in large marshes, flooded fields, stock ponds, and reservoirs; forages in pastures, meadows, and harvested grainfields; corn is especially preferred
great blue heron <i>Ardea herodias</i>	MBTA/--	Found throughout much of North America and into Central and South America. Common throughout California. Rookeries occur in tall trees near a variety of wetland habitat types. Isolated areas that discourage predation and human disturbance are preferred.
least Bell's vireo <i>Vireo bellii pusillus</i>	E/E	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, <i>Baccharis</i> , mesquite.
snowy egret <i>Egretta thula</i>	MBTA/--	Found mostly throughout North, Central, and South America. Breeds in coastal and inland wetlands. Their range has been limited over time due to habitat destruction and hunting. A migratory species that relocates from the United States and Canada to Mexico, Central America, South America, and the West Indies. Prefer shallow water inlets for feeding such as salt-marsh pools, tidal channels, and bays. Mostly along coastal areas and islands. During winter time they migrate and roost in the mangroves of the Caribbean.
Swainson's hawk <i>Buteo swainsoni</i>	BCC/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County. Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields
tricolored blackbird <i>Agelaius tricolor</i>	MBTA/CE	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties. Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony
<b>Fish</b>		
hardhead <i>Mylopharodon conocephalus</i>	--/SSC	Tributary streams in the San Joaquin drainage; large tributary streams in the Sacramento River and the main stem. Resides in low to mid-elevation streams and prefer clear, deep pools and runs with slow velocities. They also occur in reservoirs.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	--/SSC	This distinct population segment, or DPS, includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries. Free of heavy sedimentation with adequate flow and cool, clear water. Gravel that is between 0.5 to 6.0 inches in diameter, dominated by 2 to 3-inch gravel. Escape cover such as logs, undercut banks, and deep pools for spawning adults.
steelhead - Central Valley DPS <i>Oncorhynchus mykiss irideus pop. 11</i>	T/--	Populations in the Sacramento and San Joaquin rivers and their tributaries.



<i>Species</i>	<i>Status (Fed/CA)</i>	<i>Habitat Requirements</i>
<b>Mammals</b>		
hoary bat <i>Lasiurus cinereus</i>	--/--	Occur in all 50 states. Rare in the eastern United States and northern Rockies. Found mainly in the Pacific Northwest and California, Arizona, and New Mexico. Prefer older large leaf trees such as cottonwoods, willows, and fruit/nut trees for daytime roosts. Often found in association with riparian corridors. Need open spaces to forage.
Merced kangaroo rat <i>Dipodomys heermanni dixonii</i>	--/--	Grassland and savanna communities in eastern Merced & Stanislaus counties. Needs fine, deep, well-drained soil for burrowing. Granivorous, but also eats forbs & green grasses.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	--/--	Coastal regions from Del Norte County south to Santa Barbara County. Roosts in caves, tunnels, mines, and dark attics of abandoned buildings. Very sensitive to disturbances and may abandon a roost after one onsite visit
<b>Reptiles</b>		
northern California legless lizard <i>Anniella pulchra</i>	--/SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.
western pond turtle <i>Emys marmorata</i>	--/SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada. Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests

## STATUS EXPLANATIONS:

**FEDERAL**

E = ENDANGERED UNDER THE FEDERAL ENDANGERED SPECIES ACT.

T = THREATENED UNDER THE FEDERAL ENDANGERED SPECIES ACT.

D = DELISTED FROM FEDERAL LISTING STATUS.

BCC = BIRD OF CONSERVATION CONCERN

**STATE**

E = ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT.

T = THREATENED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT.

CE = CANDIDATE ENDANGERED SPECIES FOR LISTING UNDER THE STATE ENDANGERED SPECIES ACT.

SSC = SPECIES OF SPECIAL CONCERN IN CALIFORNIA.

**Special Status Wildlife Species**

**Invertebrates:** There are seven special-status invertebrates that are documented within a 10-mile radius of the project site according to the CNDDDB including: California linderiella (*Linderiella occidentalis*), Crotch bumble bee (*Bombus crotchii*), molestan blister beetle (*Lytta molesta*), obscure bumble bee (*Bombus caliginosus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardii*).

California linderiella is found in seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids. California linderiella is not anticipated to be directly affected by any individual phase or component of the proposed project because there is not appropriate aquatic habitat on the project site.

Vernal pool fairy shrimp is a federal threatened invertebrate found in the Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. They are commonly found in vernal pools and in sandstone rock outcrop pools. Vernal pool fairy shrimp is not anticipated to be directly affected by any individual phase or component of the proposed project because there is not appropriate vernal pool habitat on the project site.

Vernal pool tadpole shrimp is a federal endangered invertebrate found in vernal pools and stock ponds from Shasta county south to Merced county. Vernal pool tadpole shrimp is not anticipated to be directly affected by any individual phase or component of the proposed project because there is not appropriate vernal pool habitat on the project site.

Valley elderberry longhorn beetle is a federal threatened insect, proposed for delisting. Elderberry (*Sambucus* sp.), which is a primary host species for Valley elderberry longhorn beetle. Valley elderberry longhorn beetle is not anticipated to be directly affected by the proposed project.

Essential habitat for Crotch bumble bee, molestan blister beetle, and obscure bumble bee is not present on the project site.

No special-status invertebrate species are expected to be affected by the proposed project. Therefore, impacts to special-status invertebrates would be less-than-significant.

Fish species: There are three special-status fish that are documented within a 10-mile radius of the project site according to the CNDDDB including: hardhead (*Mylopharodon conocephalus*), Sacramento splittail (*Pogonichthys macrolepidotus*), and steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus* pop. 11). There is no essential habitat for any of these three species within the project.

No special-status fish species are expected to be affected by the proposed project. Therefore, impacts to special-status fish would be less-than-significant.

Reptile and amphibian species: There are four special-status amphibian and/or reptile that are documented within a 10-mile radius of the project site according to the CNDDDB including: California tiger salamander (*Ambystoma californiense*), western spadefoot (*Spea hammondi*), northern California legless lizard (*Anniella pulchra*), and western pond turtle (*Emys marmorata*). There is no essential habitat for any of these four species within the project.

No special-status amphibian and/or reptile species are expected to be affected by the proposed project. Therefore, impacts to special-status amphibian and/or reptile would be less-than-significant.

Birds: Special-status birds that are documented in the CNDDDB within a 10-mile radius of the project site include: burrowing owl (*Athene cunicularia*), cackling (=Aleutian Canada) goose (*Branta canadensis leucopareia*), great blue heron (*Ardea Herodias*), least Bell's vireo (*Vireo bellii pusillus*), snowy egret (*Egretta thula*), Swainson's hawk (*Buteo swainsoni*), and tricolored blackbird (*Agelaius tricolor*). The project site may provide suitable foraging habitat for a variety of potentially occurring special-status birds, including those listed above. Potential nesting habitat is present in a variety of trees located within the project site and in the vicinity. There is also the potential for other special-status birds that do not nest in this region and represent migrants or winter visitants to forage on the project site.

Year-round birds: Special-status birds that can be present in the region throughout the year include: Great blue heron (*Ardea Herodias*), bald eagle (*Haliaeetus leucocephalus*), black rail (*Laterallus jamaicensis*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), Nuttalls woodpecker (*Picoides nuttallii*), oak titmouse (*Baeolophus inornatus*), song sparrow (Modesto population) (*Melospiza melodia*), tricolored blackbird (*Agelaius tricolor*), Williamson's sapsucker (*Sphyrapicus thyroideus*), yellow-billed magpie (*Pica nuttalli*), among others. Some of these species are migratory, but also reside year-round in California.

*Summering Birds:* Special-status birds that are only present in the region in the spring and summer months include: Aleutian goose (*Branta canadensis leucopareia*), least bittern (*Ixobrychus exilis*), Swainson's hawk (*Buteo swainsoni*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and yellow-billed magpie (*Pica nuttalli*).

*Overwintering Birds:* Special-status birds that are only present in the region in the fall and winter months include: Snowy egret (*Egretta thula*), Yellow-breasted chat (*Icteria virens*), ox sparrow (*Passerella iliaca*), lesser yellowlegs (*Tringa flavipes*), Lewis's woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), merlin (*Falco columbarius*), mountain plover (*Charadrius montanus*), peregrine falcon (*Falco peregrinus*), short-eared owl (*Asio flammeus*), and western grebe (*Aechmophorus occidentalis*).

*Nesting Raptors (Birds of Prey):* All raptors (owls, hawks, eagles, falcons), including species and their nests, are protected from take pursuant to the Fish and Game Code of California Section 3503.5, and the federal Migratory Bird Treaty Act, among other federal and State regulations. Special-status raptors that are known to occur in the region include: bald eagle (*Haliaeetus leucocephalus*), burrowing owl (*Athene cunicularia*), Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo rega*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), and white-tailed kite (*Elanus leucurus*), among others.

*Analysis:* The on-site orchards are not suitable nesting habitat for the ground-nesting birds because disturbance is frequent. While the project site contains very limited nesting habitat, there are powerlines and trees located in the region that represent potentially suitable nesting habitat for a variety of special-status birds. In general, most nesting occurs from late February and early March through late July and early August, depending on various environmental conditions. In addition, common raptors such as among others, may nest in or adjacent to the project site.

New sources of noise and light during the construction and operational phases of the project could adversely affect nesters if they located adjacent to the project site in any given year. Additionally, the proposed project would eliminate the agricultural areas on the project site, which serve as potential foraging habitat for birds (including burrowing owl and Swainson's hawk) throughout the year.

**Mammals:** Special-status mammals that are documented within a 10-mile radius of the project site include: hoary bat (*Lasiurus cinereus*), Merced kangaroo rat (*Dipodomys heermanni dixonii*), and Townsend's big-eared bat (*Corynorhinus townsendii*). These species are not federal or state listed; however, they are tracked by the CNDDDB. The project site does not contain suitable habitat for Merced kangaroo rat. The project site also does not contain suitable habitat for hoary bat or Townsend's big-eared bat. Hoary bat requires open spaces to forage, and Townsend's big-eared bat are very sensitive to disturbances. The site is frequently disturbed as a result of the orchard operations, and open space is not found on-site.

No special-status mammal species are expected to be affected by the proposed project. Therefore, impacts to special-status mammals would be less-than-significant.

## Conclusion

No special-status fish, amphibian, reptile, or mammal species are expected to be affected by the proposed project. While the project site contains very limited nesting habitat, there are

powerlines and trees located in the region that represent potentially suitable nesting habitat for a variety of special-status birds. In addition, common raptors such as among others, may nest in or adjacent to the project site. Mitigation Measure BIO-1 requires measures to avoid or minimize impacts on Swainson's hawk, and Mitigation Measure BIO-2 requires and measures to avoid or minimize impacts on other protected bird species which may be found on-site. With these mitigation measures, the proposed project would have a ***less than significant*** impact relative to this topic.

#### *Mitigation Measure(s)*

***Mitigation Measure BIO-1:*** *The project proponent shall implement the following measures to avoid or minimize impacts on Swainson's hawk:*

- *No more than 30 days before the commencement of construction, a qualified avian biologist shall perform preconstruction surveys for nesting Swainson's hawk and other raptors during the nesting season (February 1 through August 31).*
- *Appropriate buffers shall be established and maintained around active nest sites during construction activities to avoid nest failure as a result of project activities. The appropriate size and shape of the buffers shall be determined by a qualified avian biologist, in coordination with CDFW, and may vary depending on the nest location, nest stage, and construction activity. The buffers may be adjusted if a qualified avian biologist determines it would not be likely to adversely affect the nest. Monitoring shall be conducted to confirm that project activity is not resulting in detectable adverse effects on nesting birds or their young. No project activity shall commence within the buffer areas until a qualified avian biologist has determined that the young have fledged or the nest site is otherwise no longer in use.*
- *Before the commencement of construction, the project proponent shall provide compensatory mitigation for the permanent loss of Swainson's hawk foraging habitat. Mitigation shall be at the CDFW specified ratios, which are based on distance to nests. The Plan Area's distance to the closest nest falls within the range of "within 5 miles of an active nest tree but greater than 1 mile from the nest tree." As such, the Project shall be responsible for 0.75 acres of each acre of urban development authorized (0-75:1 ratio). The project proponent shall either provide lands protected through fee title acquisition or conservation easement (acceptable to the CDFW) on agricultural lands or other suitable habitats which provide foraging habitat for Swainson's hawk.*

***Mitigation Measure BIO-2:*** *The project proponent shall implement the following measure to avoid or minimize impacts on other protected bird species that may occur on the site:*

- *Preconstruction surveys for active nests of special-status birds shall be conducted by a qualified avian biologist in all areas of suitable habitat within 500 feet of project disturbance. Surveys shall be conducted within 14 days before commencement of any construction activities that occur during the nesting season (February 15 to August 31) in a given area.*
- *If any active nests, or behaviors indicating that active nests are present, are observed, appropriate buffers around the nest sites shall be determined by a qualified avian biologist to avoid nest failure resulting from project activities. The size of the buffer shall depend on the species, nest location, nest stage, and specific construction activities to be performed while the nest is active. The buffers may be adjusted if a qualified avian biologist determines it would not be likely to adversely affect the nest. If buffers are adjusted, monitoring will be conducted to confirm that project activity is not resulting in detectable adverse effects on*

*nesting birds or their young. No project activity shall commence within the buffer areas until a qualified avian biologist has determined that the young have fledged or the nest site is otherwise no longer in use.*

**Responses b):** There is no riparian habitat on the project site. The CNDDDB record search revealed documented occurrences of one sensitive habitat within 15 miles of the project site including: Northern Hardpan Vernal Pool. This sensitive natural community does not occur within the project site. Implementation of the proposed project would have a ***less than significant*** impact on riparian habitats or natural communities.

**Response c):** The project site does not contain protected wetlands or other jurisdictional areas and there is no need for permitting associated with the federal or state Clean Water Acts. The TID canal along the northern site boundary is a man-made facility with the sole purpose of agricultural irrigation. These ditches are exempt from permitting. Absent any wetlands or jurisdictional waters, implementation of the proposed project would have ***less than significant*** impact relative to this topic.

**Response d):** The CNDDDB record search did not reveal any documented wildlife corridors or wildlife nursery sites on or adjacent to the project site. Special status fish species documented within the region include: hardhead (*Mylopharodon conocephalus*), Sacramento splittail (*Pogonichthys macrolepidotus*), and steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus* pop. 11). The closest major natural movement corridor for native fish that are documented in the region is the Tuolumne River, located to the north of the project site. The land uses within the project site would not have any direct disturbance to the Tuolumne River or its tributaries, and therefore, would not have any direct disturbance to the movement corridor or habitat.

The ongoing operational phase of the proposed project requires discharge of stormwater into the City storm drainage system, which ultimately discharges into the TID Canals. The discharge of stormwater could result in indirect impacts to special status fish and wildlife if stormwater was not appropriately treated through best management practices (BMPs) prior to its discharge to the canals. Section 7 of the City's Improvement Standards establish minimum storm water management requirements and controls. According to the standards, storm drain discharges must include stormwater quality control measures, and stormwater generated must be adequately treated before discharge. Structural and non-structural stormwater management systems and BMPs are required. Additionally, new developments are required to prepare and submit a Stormwater Management Plan for the City's review, which include design calculations to ensure 10-year, 24-hour, and 100-year duration storms can be accommodated. The City's Improvement Standards also include requirements for detention basins, pipeline sizing and drain inlets, and other related topics.

Storm water drainage is managed through the implementation of BMPs to the extent they are technologically achievable to prevent and reduce pollutants. The management of water quality through BMPs is intended to ensure that water quality does not degrade to levels that would interfere or impede fish or wildlife. Implementation of these required measures would ensure that this potential impact is reduced to a ***less than significant*** level.

**Response e):** The Land Use and Conservation and Open Space Elements of the General Plan establishes numerous policies related to biological resources (listed below). Additionally, Chapter 12.30, Street Trees, of the Hughson Municipal Code outlines the planting of trees in new subdivisions within the City. Further, Chapter 17.03, Citywide Regulations and Special



Provisions, outlines requirements for street tree planting and new subdivisions Consistency with these policies and ordinances are discussed below.

### Land Use Element Policies

Policy LU-3.10: While the City recognizes that there will be a loss of orchard trees as development occurs, new development will be encouraged to design landscaping with mature trees to create a feeling similar to that of an active orchard.

**Consistent:** *The project's preliminary landscape plan indicates that shrubs, accent trees, and signature trees will be planted throughout the site. Signature trees would generally be planted along the perimeter of the site boundary, as well as within the proposed park areas. Accent trees would be planted along the proposed internal roadways and parks. Additionally, a tree survey would be completed and submitted to the City for development review. Selected orchard trees that are representative of the land's agricultural heritage would be retained, as determined by the City's Planning Commission or planning officer. These requirements are included in Mitigation Measure BIO-3.*

Policy LU-3.11: Until the City adopts a Master Tree Plan, new residential and commercial developments should:

- Use landscaping to differentiate between gateways, major intersections, and primary and secondary arterials, where appropriate.
- Develop a palette of appropriate trees for the project, taking into account, soils, rooting characteristics and ongoing maintenance of trees.
- Provide adequate shading along roadways, sidewalks and in parking lots.

**Consistent:** *As noted above, the project's preliminary landscape plan indicates that shrubs, accent trees, and signature trees will be planted throughout the site. The landscape plan includes a variety of trees and shrubs. The proposed landscaping would provide shading along the proposed roadways and sidewalks. The landscape plan has been designed to differentiate between proposed internal roadways, adjacent arterial roadways, and gateways to the project.*

### Conservation and Open Space Element Policies

Policy COS-3.1: New developments shall preserve, protect and incorporate established native trees into the site design.

**Consistent:** *The project site contains orchard trees, throughout the site. Native trees are not found on-site.*

Policy COS-3.2: New development shall meet all federal, State and regional regulations for habitat and species protection.

**Consistent:** *As discussed throughout this section, the proposed project would be subject to any applicable federal, State, or regional regulations pertaining to potential impacts to habitat and species protection.*

Policy COS-3.5: New development shall ensure that active nests for special-status bird species shall be avoided during construction through pre-construction surveys, and if active nests are encountered, through restrictions on construction activities until any young have fledged. This shall include both ground nesting burrowing owl and tree nesting special-status birds

**Consistent:** *Should active tree nests be found on-site during the preconstruction surveys required by Mitigation Measures BIO-1 and BIO-2, avoidance measures would be implemented. No project activity would commence within the buffer areas until a qualified avian biologist has determined that the young have fledged or the nest site is otherwise no longer in use.*

Policy COS-3.6: New development shall ensure that any jurisdictional waters are avoided to the maximum extent practicable, any required authorization is obtained from jurisdictional agencies, and adequate mitigation is provided for unavoidable impact.

**Consistent:** *The project does not include any jurisdictional waters.*

## Municipal Code

Chapter 12.30, Street Trees, of the Hughson Municipal Code outlines the planting of trees in new subdivisions within the City. Section 12.30.050 notes the following regarding the City's official street tree plan:

*The planning commission shall prepare and maintain an official street tree plan for the city. The director or her or his duly authorized representative shall require that all new planting of street trees shall be in accordance with the official street tree plan of Hughson. If existing street trees are removed, they shall be replaced with trees which conform to the official street tree plan. (Ord. 91-05 § 3, 1991)*

Additionally, Section 12.30.060 notes the following regarding planting trees in new subdivisions:

*Before any street improvements in any new subdivision of real property in the city are accepted by the city council, the subdivider shall pay to the city the total costs of all the subdivision or shall have the street trees planted to conform to the provisions of the official street tree plan. If payment for planting the street trees is made by the subdivider to the city, the city shall plant the trees at the proper time and to conform to the official street tree plan. Watering and care of the trees thereafter shall be the responsibilities of the subdivider or the purchasers of the property. (Ord. 91-05 § 3, 1991)*

The City has not prepared an official street tree plan.<sup>1</sup> The project's preliminary landscape plan indicates that shrubs, accent trees, and signature trees will be planted throughout the site. Signature trees would generally be planted along the perimeter of the site boundary, as well as within the proposed park areas. Accent trees would be planted along the proposed internal roadways and parks. The applicant would be required to pay the total costs of all the trees to the City, and the City would plant the trees at the proper time. The watering and care of the trees would be the responsibility of the subdivider or purchasers of the property. The project would be subject to the requirements of Section 12.30.060. These requirements are included in Mitigation Measure BIO-3.

Section 17.03.092, Trees, establishes basic standards and measures for the preservation, removal, and replacement of trees. Section 17.03.092(D) notes the following requirements regarding street tree planting:

1. *Permission to Plant Required. No trees or shrubs shall be planted in any street tree area or other public place without permission of the planning officer.*

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<sup>1</sup> Personal communication with Lea Simvoulakis, Community Development Director, City of Hughson. June 19, 2019.



2. *Planting of Street Trees in New Development. Before any street improvements in any new subdivision of real property in the city are accepted by the city council, the subdivider shall pay to the city the total cost of planting all the required street trees or shall have the street trees planted to conform to the provisions of the official street tree plan. If payment for planting the street trees is made by the subdivider to the city, the city shall plant the trees at the proper time and conform to the official street tree plan. Watering and care of the trees thereafter shall be the responsibilities of the subdivider or the purchasers of the property.*

These requirements are nearly identical to those outlined above in Section 12.30.060 of the Code. Section 17.03.092(E) notes the following requirements regarding street tree planting:

1. *Preservation of Existing Trees. The location, size, accurate driplines and species of existing trees shall be shown on a tree survey in the same scale as development plans submitted for development review. All trees proposed for removal shall be identified. If there is disturbance proposed within the dripline of a significant tree, a certified arborist's assessment and protection measures must be provided with the development application. If significant trees are proposed for removal on development plans, the applicant shall replace them with trees whose size, number, and planting location shall be determined by the planning officer before final occupancy is granted to any new residents. The size and age of the tree will determine how many new trees may be substituted for the removed tree but, at a minimum, three new trees will replace one tree removed. The ratio may be increased at the discretion of the planning officer.*
2. *Preservation of Orchard Trees. Where orchard trees are to be cut down, removed or relocated as part of new development, the planning commission or planning officer shall require the retention of selected orchard trees within the new development or subdivision that are representative of the land's agricultural heritage. For orchards in productive use for at least five years prior to the new development, a minimum of 10 percent of the existing orchard trees shall be preserved.*

According to Section 17.01.090, Definitions, of the Code, a "significant tree" means any tree which measures three inches or more in diameter at breast height (DBH) (four and one-half feet above natural grade) or immediately below the lowest branch, whichever is lower. The project site is currently planted with orchard trees over nearly the entire project site. The trees have been productive for at least five years prior to the proposed project development. Aerial photographs of the project site show that the site has been used for orchard and/or agricultural uses since at least August 1998. The existing orchard trees vary in age and size. The orchard trees west of the existing on-site residence appear to be "significant trees" due to their DBH. The orchard trees south and east of the existing on-site residence and adjacent north of the subdivision south of the site appear to be younger and smaller than the aforementioned trees, although a tree survey would be required in order to determine the exact DBH for these younger trees. Nevertheless, the project site does contain some "significant trees".

A tree survey would be completed and submitted to the City for development review. Additionally, selected orchard trees that are representative of the land's agricultural heritage would be retained, as determined by the City's Planning Commission or planning officer. The project would be subject to the requirements of Section 17.03.092(E). These requirements are included in Mitigation Measure BIO-3.

## Conclusion

The proposed project is consistent with the General Plan policies protecting biological resources. With implementation of Mitigation Measure BIO-3, the project would also be consistent with the local ordinances which protect biological resources. The following mitigation measure would require compliance with the Hughson Municipal Code, which requires payment of the costs of all trees, watering and care of the trees, and submittal of a tree survey and certified arborist's assessment with protection measures. With the implementation of the following mitigation measure, the proposed project would have a ***less than significant*** impact relative to this topic.

### *Mitigation Measure(s)*

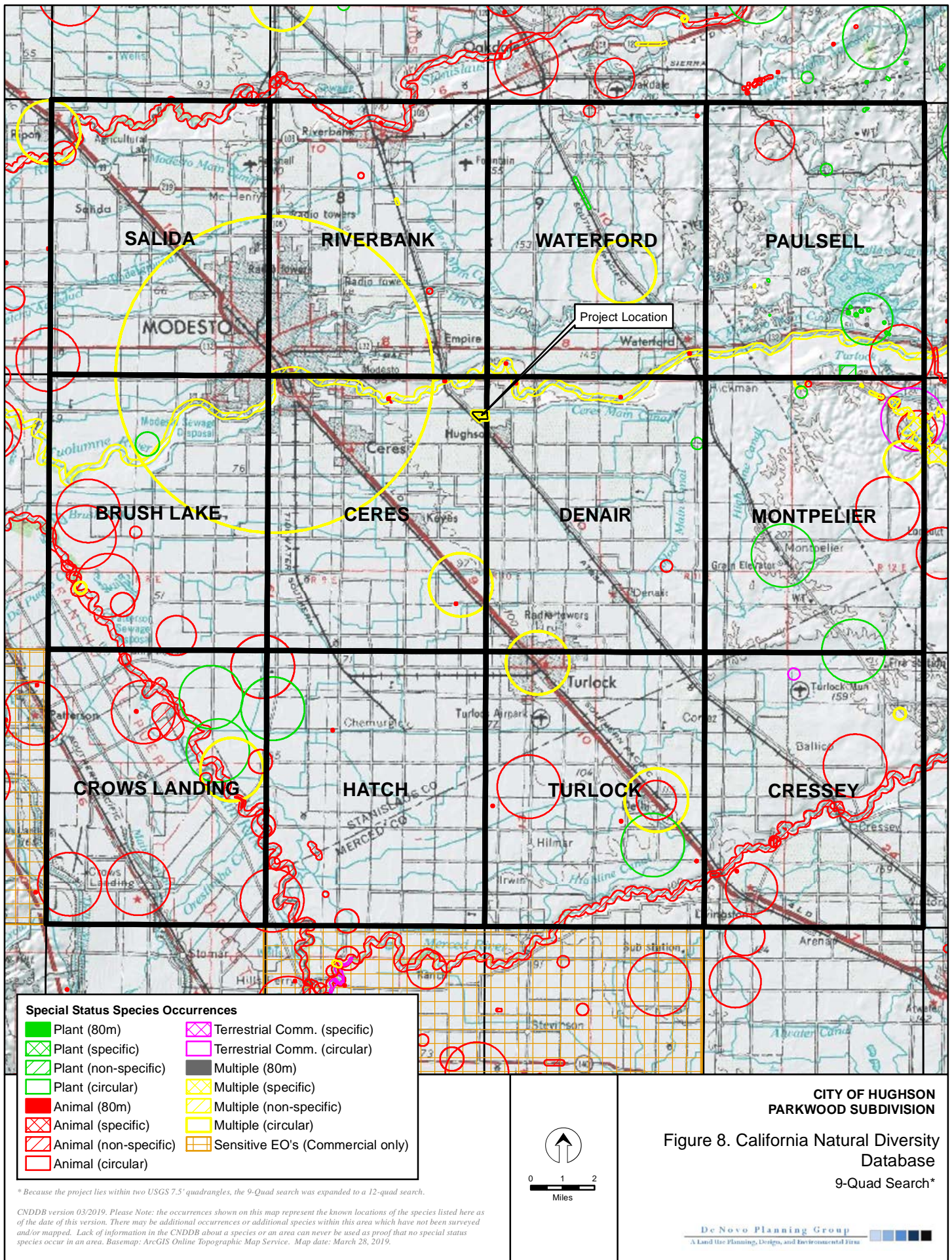
**Mitigation Measure BIO-3:** *Prior to approval of any street improvements, the project applicant shall pay to the City the total costs of all the trees, pursuant to Section 12.30.060 of the Municipal Code. The City shall plant the trees at the proper time. Watering and care of the trees thereafter shall be the responsibilities of the applicant or the purchasers of the property. Additionally, pursuant to Section 17.03.092 of the Municipal Code, the project applicant shall not plant trees or shrubs in any street tree area or other public place without permission of the planning officer.*

*Further, the project applicant shall submit a tree survey to the City, pursuant to Section 17.03.092(E). The location, size, accurate driplines and species of existing trees shall be shown on the tree survey in the same scale as development plans submitted for development review. All trees proposed for removal shall be identified. If there is disturbance proposed within the dripline of a significant tree, a certified arborist's assessment and protection measures shall be provided. If significant trees are proposed for removal, the applicant shall replace them with trees whose size, number, and planting location shall be determined by the planning officer before final occupancy is granted to any new residents. The size and age of the tree shall be used to determine how many new trees shall be substituted for the removed tree but, at a minimum, three new trees shall replace one tree removed. The ratio may be increased at the discretion of the planning officer.*

*Where orchard trees are to be cut down, removed, or relocated as part of new development, the planning commission or planning officer shall require the retention of selected orchard trees within the proposed subdivision that are representative of the land's agricultural heritage. For orchards in productive use for at least five years prior to the new development, a minimum of 10 percent of the existing orchard trees shall be preserved. This shall be determined by the planning officer.*

**Response f):** The project site is not subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, the proposed project would have ***no impact*** relative to this topic.





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## V. CULTURAL RESOURCES

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

### *Responses to Checklist Questions*

**Responses a), b):** Records of previously recorded cultural resources and cultural resource investigations were examined by the Central California Information Center (CCIC) of the California Historical Resources Information System (CHRIS) on for the project area (CCIC File # 10995N). No prehistoric or historic period cultural resources have been recorded within the project area. Two linear historic period resources are located adjacent to the project area: the Atchison, Topeka and Santa Fe/Burlington Northern and Santa Fe (ATSF/BNSF) railroad line and the TID Canal, both previously recorded in part, and have been assigned primary numbers in the state system. The features appear on the topographic maps, and have been evaluated elsewhere as not significant resources. Additionally, the 1916 Ceres topographic map indicates one building in the western portion of the project site. This building is no longer present on the 1939 topographic map.

The project site was surveyed on April 27, 2019 by Peak & Associates. The site was investigated by walking linear transects across the entire property, providing complete coverage. As noted above, two historic period resources are located adjacent to or close to the site, including the TID Canal and the ATSF/BNSF railroad tracks. Neither of these resources are within the project site, nor do they encroach in any way into the site. The two existing single-family homes with associated garages and buildings located to the north of the site were not surveyed. At least one of the structures may be older than 50 years.

The soils of the project area are mostly homogeneous loamy sand, light tan to medium brown, with little native gravels. Soil directly around the trees or irrigation lines tends to have more organic inclusions. Native stone gravels appeared as metamorphic, and not suitable for prehistoric tool use. The visibility of the soil at time of survey was very good, mostly due to weed and vegetation abatement, but also aided by access roads and occasional rodent disturbance.

No evidence of a historic building could be found at the location indicated on the 1916 or 1939 topographic maps. No evidence was found of any prehistoric or historical resources.

The record search indicates that: the project site does not contain any recorded prehistoric or historic archaeological resources or historic buildings. Additionally, with the regular disturbance associated with the agricultural operations it is anticipated that any buried resources would have been found over time. Nevertheless, there is some possibility that a buried site may exist in the area and be obscured by vegetation, fill, or other historic activities, leaving no surface evidence. Should artifacts or unusual amounts of stone, bone, or shell be uncovered during construction activities, an archeologist would be consulted for an evaluation. Implementation of the following mitigation measure would require investigations and avoidance methods in the event that a

previously undiscovered cultural resource is encountered during construction activities. With implementation of the following mitigation measure, development of the proposed project would have a **less than significant** impact on historical and archaeological resources.

*Mitigation Measure(s)*

**Mitigation Measure CUL-1:** *If cultural resources (i.e., prehistoric sites, historic sites, isolated artifacts/features, and paleontological sites) are discovered, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Hughson shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology (or a qualified paleontologist in the event paleontological resources are found) shall be retained to determine the significance of the discovery. The City of Hughson shall consider recommendations presented by the professional for any unanticipated discoveries and shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Specific measures are developed based on the significance of the find.*

**Response c):** Indications are that humans have occupied the Central Valley for at least 10,000 years and it is not always possible to predict where human remains may occur outside of formal burials. Therefore, excavation and construction activities, regardless of depth, may yield human remains that may not be interred in marked, formal burials. Under CEQA, human remains are protected under the definition of archaeological materials as being “any evidence of human activity.” Additionally, Public Resources Code Section 5097 has specific stop-work and notification procedures to follow in the event that human remains are inadvertently discovered during construction. Implementation of the following mitigation measure would reduce this potential impact to a **less than significant** level.

*Mitigation Measure(s)*

**Mitigation Measure CUL-2:** *If any human remains are found during grading and construction activities, all work shall be halted immediately within 50 meters (165 feet) of the discovery and the County Coroner must be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner shall notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed. Additionally, if the Native American resources are identified, a Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, may also be required and, if required, shall be retained at the applicant's expense.*



## VI. ENERGY

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

### *Responses to Checklist Questions*

**Responses a), b):** Appendix F of the State CEQA Guidelines requires consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce “wasteful, inefficient and unnecessary” energy usage (Public Resources Code Section 21100, subdivision [b][3]). According to Appendix F of the CEQA Guidelines, the means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed project would be considered “wasteful, inefficient, and unnecessary” if it were to violate state and federal energy standards and/or result in significant adverse impacts related to project energy requirements, energy inefficiencies, energy intensiveness of materials, cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, fail to comply with existing energy standards, otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

The proposed project includes the construction of 299 single-family residential units. The amount of energy used at the project site would directly correlate to the size of the proposed units, the energy consumption of associated unit appliances, and outdoor lighting. Other major sources of proposed project energy consumption include fuel used by vehicle trips generated during project construction and operation, and fuel used by off-road construction vehicles during construction.

The following discussion provides calculated levels of energy use expected for the proposed project, based on commonly used modelling software (i.e. CalEEMod v.2016.3.2 and the California Air Resource Board’s EMFAC2014). It should be noted that many of the assumptions provided by CalEEMod are conservative relative to the proposed project. Therefore, this discussion provides a conservative estimate of proposed project emissions.

### **Electricity and Natural Gas**

Electricity and natural gas used by the proposed project would be used primarily to power on-site buildings. Total annual unmitigated and mitigated electricity (kWh) and natural gas (kBtu) usage associated with the operation of the proposed project are shown in Tables 8 and 9, below (as provided by CalEEMod). The proposed project incorporates feasible mitigation to reduce the proposed project’s operational electricity and natural gas consumption.

According to Calico’s Appendix A: Calculation Details for CalEEMod, CalEEMod uses the California Commercial End Use Survey (CEUS) database to develop energy intensity value for non-residential buildings. The energy use from residential land uses is calculated based on the

Residential Appliance Saturation Survey (RASS). Similar to CEUS, this is a comprehensive energy use assessment that includes the end use for various climate zones in California.

**Table 8: Project Operational Natural Gas and Electricity Usage (Unmitigated Scenario)**

<i>Emissions<sup>(a)</sup></i>	<i>Natural Gas (kBtu/year)</i>	<i>Electricity (kWh/year)</i>
Residential – Single Family Housing	7,817,430	2,619,460

NOTE: <sup>(a)</sup> NUMBERS PROVIDED HERE MAY NOT ADD UP EXACTLY TO TOTAL DUE TO ROUNDING.

SOURCE: CALCEMOD (v.2016.3.2).

**Table 9: Project Operational Natural Gas and Electricity Usage (Mitigated Scenario)**

<i>Emissions<sup>(a)</sup></i>	<i>Natural Gas (kBtu/year)</i>	<i>Electricity (kWh/year)</i>
Residential – Single Family Housing	7,817,430	2,569,200

NOTE: <sup>(a)</sup> NUMBERS PROVIDED HERE MAY NOT ADD UP EXACTLY TO TOTAL DUE TO ROUNDING.

SOURCE: CALCEMOD (v.2016.3.2).

As shown in Tables 8 and 9, project operational energy usage would be reduced with implementation of project components considered mitigation by CalCEMOD (note: given the limited mitigation options available in the current version of CalCEMOD, the reduction attributable to mitigation represents a conservative analysis). As described in Section III, Air Quality, the proposed project incorporates feasible mitigation that would reduce the proposed project's energy consumption, as compared to the unmitigated scenario. The mitigation measures included in Section III would require further mitigation that would reduce proposed project operational electricity and natural gas emissions. These reductions in overall proposed project energy usage also reflect a reduction in the project's energy intensity.

### On-Road Vehicles (Operation)

The proposed project would generate vehicle trips during its operational phase. According to the Transportation Impact Analysis Report prepared for the proposed project (Fehr & Peers, 2019), the project would generate approximately 2,823 new daily vehicles trips. In order to calculate operational on-road vehicle energy usage and emissions, default trip lengths generated by CalCEMOD were used, which are based on the project location and urbanization level parameters De Novo (the Initial Study consultant) selected within CalCEMOD (i.e. "San Joaquin Valley Air Pollution Control District" project location and "Urban" setting, respectively). These values are provided by the individual districts or use a default average for the state, depending on the location of the proposed project (CAPCOA, 2017). Based on default factors provided by CalCEMOD, the average distance per trip was conservatively calculated to be approximately 8.97 miles. Therefore, the proposed project would generate at total of approximately 25,313 average daily vehicle miles travelled (Average Daily VMT). Using fleet mix data provide by CalCEMOD (v2016.3.2), and Year 2021 gasoline and diesel MPG (miles per gallon) factors for individual vehicle classes as provided by EMFAC2014, De Novo derived weighted MPG factors for operational on-road vehicles of approximately 25.0 MPG for gasoline and 7.6 MPG for diesel vehicles. With this information, De Novo calculated as a conservative estimate that the unmitigated proposed project would generate vehicle trips that would use a total of approximately 850 gallons of gasoline and 533 gallons of diesel fuel per day, on average, or 310,240 gallons of gasoline and 194,715 annual gallons of diesel fuel per year.

### On-Road Vehicles (Construction)

The proposed project would also generate on-road vehicle trips during project construction (from construction workers and vendors). Estimates of vehicle fuel consumed were derived

based on the assumed construction schedule, vehicle trip lengths and number of workers per construction phase as provided by CalEEMod, and Year 2021 gasoline MPG factors provided by EMFAC2014. For the purposes of simplicity, it was assumed that all vehicles used gasoline as a fuel source (as opposed to diesel fuel or alternative sources). Table 10, below, describes gasoline and diesel fuel used by on-road mobile sources during each phase of the construction schedule. As shown, the vast majority of on-road mobile vehicle fuel used during the construction of the proposed project would occur during the building construction phase. See Appendix A for a detailed calculation.

**Table 10: On-Road Mobile Fuel Generated by Project Construction Activities – By Phase**

<b>Construction Phase</b>	<b># of Days</b>	<b>Total Daily Worker Trips<sup>(a)</sup></b>	<b>Total Daily Vendor Trips<sup>(a)</sup></b>	<b>Gallons of Gasoline Fuel<sup>(b)</sup></b>	<b>Gallons of Diesel Fuel<sup>(b)</sup></b>
Site Preparation	40	18	-	317	-
Grading	110	20	-	969	-
Building Construction	1,110	108	32	52,780	38,132
Paving	75	15	-	495	-
Architectural Coating	75	22	-	726	-
<b>Total</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>55,287</b>	<b>38,132</b>

NOTE: <sup>(a)</sup> PROVIDED BY CALEEMOD. <sup>(b)</sup> SEE APPENDIX A FOR FURTHER DETAIL

SOURCE: CALEEMOD (v.2016.3.2); EMFAC2014.

### Off-Road Vehicles (Construction)

Off-road construction vehicles would use diesel fuel during the construction phase of the proposed project. A non-exhaustive list of off-road constructive vehicles expected to be used during the construction phase of the proposed project includes: cranes, forklifts, generator sets, tractors, excavators, and dozers. Based on the total amount of CO<sub>2</sub> emissions expected to be generated by the proposed project (as provided by the CalEEMod output), and a CO<sub>2</sub> to diesel fuel conversion factor (provided by the U.S. Energy Information Administration), the proposed project would use a total of approximately 36,398 gallons of diesel fuel for off-road construction vehicles (during the site preparation and grading phases of the proposed project). Detailed calculations are provided in Appendix A.

### Other

Proposed project landscape maintenance activities would generally require the use fossil fuel (i.e. gasoline) energy. For example, lawn mowers require the use of fuel for power. As an approximation, it is estimated that landscape care maintenance would require approximately eight individuals one full day per week, or 3,354 hours per year (or 833.6 hours per year per landscaper). Assuming an average of approximately 0.5 gallons of gasoline used per person-hour, the proposed project would require the use of approximately 1,678 gallons of gasoline per year to power landscape maintenance equipment. The energy used to power landscape maintenance equipment would not differ substantially from the energy required for landscape maintenance for similar project.

The proposed project could also use other sources of energy not identified here. Examples of other energy sources include alternative and/or renewable energy (such as solar PV) and/or on-site stationary sources (such as on-site diesel generators) for electricity generation. The

proposed project would be solar-ready, which could reduce the need for fossil fuel-based energy (for proposed project buildings), including for electricity.

### Conclusion

The proposed project would use energy resources for the operation of project buildings (electricity and natural gas), for on-road vehicle trips (e.g. gasoline and diesel fuel) generated by the proposed project, and from off-road construction activities associated with the proposed project (e.g. diesel fuel). Each of these activities would require the use of energy resources. The proposed project would be responsible for conserving energy, to the extent feasible, and relies heavily on reducing per capita energy consumption to achieve this goal, including through Statewide and local measures.

The proposed project would be in compliance with all applicable Federal, State, and local regulations regulating energy usage. For example, PG&E is responsible for the mix of energy resources used to provide electricity for its customers, and it is in the process of implementing the Statewide Renewable Portfolio Standard (RPS) to increase the proportion of renewable energy (e.g. solar and wind) within its energy portfolio. PG&E is expected to achieve at least a 33 percent mix of renewable energy resources by 2020, and 50 percent by 2030. Additionally, energy-saving regulations, including the latest State Title 24 building energy efficiency standards ("part 6"), would be applicable to the proposed project. Other Statewide measures, including those intended to improve the energy efficiency of the statewide passenger and heavy-duty truck vehicle fleet (e.g. the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel. These energy savings would continue to accrue over time. Furthermore, as described previously, the incorporation of the mitigation measures described previously in this section would further reduce project energy consumption.

As a result, the proposed project would not result in any significant adverse impacts related to project energy requirements, energy use inefficiencies, and/or the energy intensiveness of materials by amount and fuel type for each stage of the project including construction, operations, maintenance, and/or removal. PG&E, the electricity and natural gas provider to the site, maintains sufficient capacity to serve the proposed project. The proposed project would comply with all existing energy standards, including those established by the City of Hughson, and would not result in significant adverse impacts on energy resources. Furthermore, existing connections exist between the project site and nearby pedestrian and bicycle pathways, and public transit access exists nearby, reducing the need for local motor vehicle travel. Although improvements to the City's pedestrian, bicycle, and public transit systems would provide further opportunities for alternative transit, the proposed project would be linked closely with existing networks that, in large part, are sufficient for most residents of the proposed project and the City of Hughson as a whole. For these reasons, the proposed project would not be expected cause an inefficient, wasteful, or unnecessary use of energy resources nor cause a significant impact on any of the threshold as described by Appendix F of the CEQA Guidelines. This is a *less than significant* impact.

## VII. GEOLOGY AND SOILS

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
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.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?		X		
iv) Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?		X		
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?		X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	

### Responses to Checklist Questions

**Responses a.i), a.ii):** Figure 9 shows the earthquake faults in the vicinity of the project site. As shown in the figure, the site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone, and known surface expression of active faults does not exist within the site. However, the site is located within a seismically active region. The U.S. Geological Survey identifies faults within 23 miles of the project site, including one unnamed fault and the San Joaquin Fault. The nearest Alquist-Priolo Fault Zone, the Ortigalita fault, is approximately 35 miles southwest of the project site.

## **Geologic Hazards**

Potential seismic hazards resulting from a nearby moderate to major earthquake could generally be classified as primary and secondary. The primary seismic hazard is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking and ground lurching.

### **Ground Rupture**

Because the property does not have known active faults crossing the site, and the site is not located within an Earthquake Fault Special Study Zone, ground rupture is unlikely at the subject property.

### **Ground Shaking**

According to the California Geological Survey's Probabilistic Seismic Hazard Assessment Program, Hughson is considered to be within an area that is predicted to have a 10 percent probability that a seismic event would produce horizontal ground shaking of 10 to 20 percent within a 50-year period. There will always be a potential for groundshaking caused by seismic activity anywhere in California, including the project site.

In order to minimize potential damage to the buildings and site improvements, all construction in California is required to be designed in accordance with the latest seismic design standards of the California Building Code. The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design and Chapter 18 addresses soils and foundations. Collectively, these state requirements, which have been adopted by the City of Hughson, include design standards and requirements that are intended to minimize impacts to structures in seismically active areas of California. Section 1613 specifically provides structural design standards for earthquake loads. Section 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Design in accordance with these standards and policies would reduce any potential impact to a less than significant level.

### **Landslides**

The proposed project site is not susceptible to landslides because the area is essentially flat. This is a less than significant impact.

### **Conclusion**

In order to minimize potential damage to the buildings and site improvements, all construction in California is required to be designed in accordance with the latest seismic design standards of the California Building Code. The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design and Chapter 18 addresses soils and foundations. Collectively, these state requirements, which have been adopted by the City of Hughson, include design standards and requirements that are intended to minimize impacts to structures in seismically active areas of California. Section 1613 specifically provides structural design standards for earthquake loads. Section 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Additionally, the City of Hughson has adopted a Building Code Regulations ordinance and incorporated numerous policies relative to seismicity to ensure the health and safety of all people. Design in accordance with these standards and policies would reduce any potential



impact to a less than significant level. Because all development in the project site must be designed in conformance with these state and local standards and policies, any potential impact would be considered *less than significant*.

**Responses a.iii), c), d):** Liquefaction normally occurs when sites underlain by saturated, loose to medium dense, granular soils are subjected to relatively high ground shaking. During an earthquake, ground shaking may cause certain types of soil deposits to lose shear strength, resulting in ground settlement, oscillation, loss of bearing capacity, landsliding, and the buoyant rise of buried structures. The majority of liquefaction hazards are associated with sandy soils, silty soils of low plasticity, and some gravelly soils. Cohesive soils are generally not considered to be susceptible to liquefaction. In general, liquefaction hazards are most severe within the upper 50 feet of the surface, except where slope faces or deep foundations are present.

Figure 10 shows the project site soils. The site soils include Hanford sandy loam (5.3 acres of the total project site), Hanford sandy loam, moderately deep over silt (34.2 acres of the total project site), and Hanford deep over silt (16.5 acres of the total project site). The sandy on-site soils could be subject to liquefaction.

As noted above, Hughson is considered to be within an area that is predicted to have a 10 percent probability that a seismic event would produce horizontal ground shaking of 10 to 20 percent within a 50-year period. There will always be a potential for groundshaking caused by seismic activity anywhere in California, including the project site. Significant liquefaction induced settlement is not generally anticipated at the site. However, based on the anticipated site conditions, some seismic settlement is generally anticipated.

Expansive soils are those that undergo volume changes as moisture content fluctuates; swelling substantially when wet or shrinking when dry. Soil expansion can damage structures by cracking foundations, causing settlement and distorting structural elements. Expansion is a typical characteristic of clay-type soils. Expansive soils shrink and swell in volume during changes in moisture content, such as a result of seasonal rain events, and can cause damage to foundations, concrete slabs, roadway improvements, and pavement sections.

Soil expansion is dependent on many factors. The more clayey, critically expansive surface soil and fill materials will be subjected to volume changes during seasonal fluctuations in moisture content. Figure 11 shows the expansive soil potential within the project site. As shown in the figure, the potential for soil expansion to occur at the project site is low.

Future development of the project could expose people or structures to adverse effects associated with liquefaction and/or soil expansion. Construction of the project would be required to comply with the City's General Plan policies related to geologic and seismic hazards. For example, Policy S-1.1 requires that new development would be subject to adequate professional geologic and engineering studies, and Policy S-1.2 requires the City to enforce building codes adopted by the State of California for all new construction and renovations.

With implementation of the following mitigation measure, this potential impact would be *less than significant*.

*Mitigation Measure(s)*

**Mitigation Measure GEO-1:** Prior to issuance of any building permits, the developer shall be required to submit building plans to the City of Hughson for review and approval. The building plans shall also comply with all applicable requirements of the most recent California Building Standards

*Code. All on-site soil engineering activities shall be conducted under the supervision of a licensed geotechnical engineer or certified engineering geologist.*

**Response b):** The project site currently contains orchard uses. According to the project site plans prepared for the proposed project, development of the proposed project would result in the creation of new impervious surface areas throughout the project site. The development of the project site would also cause ground disturbance of top soil. The ground disturbance would be limited to the areas proposed for grading and excavation, including the proposed driveway areas, residential building pads, and drainage, sewer, and water infrastructure improvements. After grading and excavation, and prior to overlaying the disturbed ground surfaces with impervious surfaces and structures, the potential exists for wind and water erosion to occur, which could adversely affect downstream storm drainage facilities.

Without implementation of appropriate BMPs related to prevention of soil erosion during construction, development of the project would result in a potentially significant impact with respect to soil erosion. Implementation of the following mitigation measures would ensure the impact is ***less than significant***.

*Mitigation Measure(s)*

**Mitigation Measure GEO-2:** *The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City of Hughson and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB.*

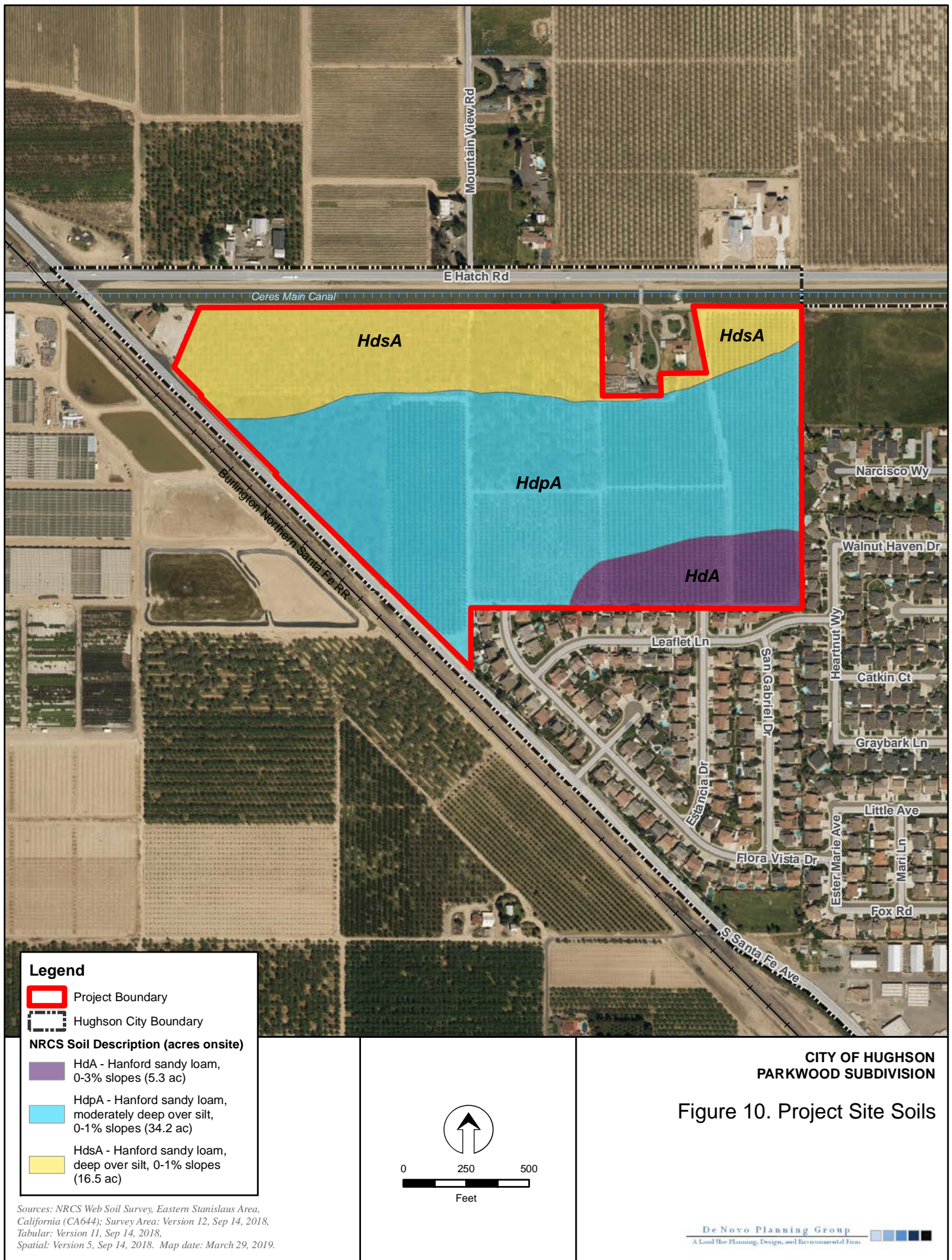
**Response e):** The project has been designed to connect to the existing City sewer system and septic systems will not be used. Therefore, ***no impact*** would occur related to soils incapable of adequately supporting the use of septic tanks.

**Response f):** Known paleontological resources or sites are not located on the project site. Additionally, unique geologic features are not located on the site. The site is currently undeveloped, lined with orchards, and surrounded by existing or future urban development. As discussed in Section V, Cultural Resources, should artifacts or unusual amounts of stone, bone, or shell be uncovered during construction activities, an archeologist should be consulted for an evaluation. Implementation of Mitigation Measure CUL-1 would require investigations and avoidance methods in the event that a previously undiscovered cultural resource is encountered during construction activities. With implementation of Mitigation Measure CUL-1, impacts to paleontological resources or unique geologic features are not expected. This is a ***less than significant*** impact.



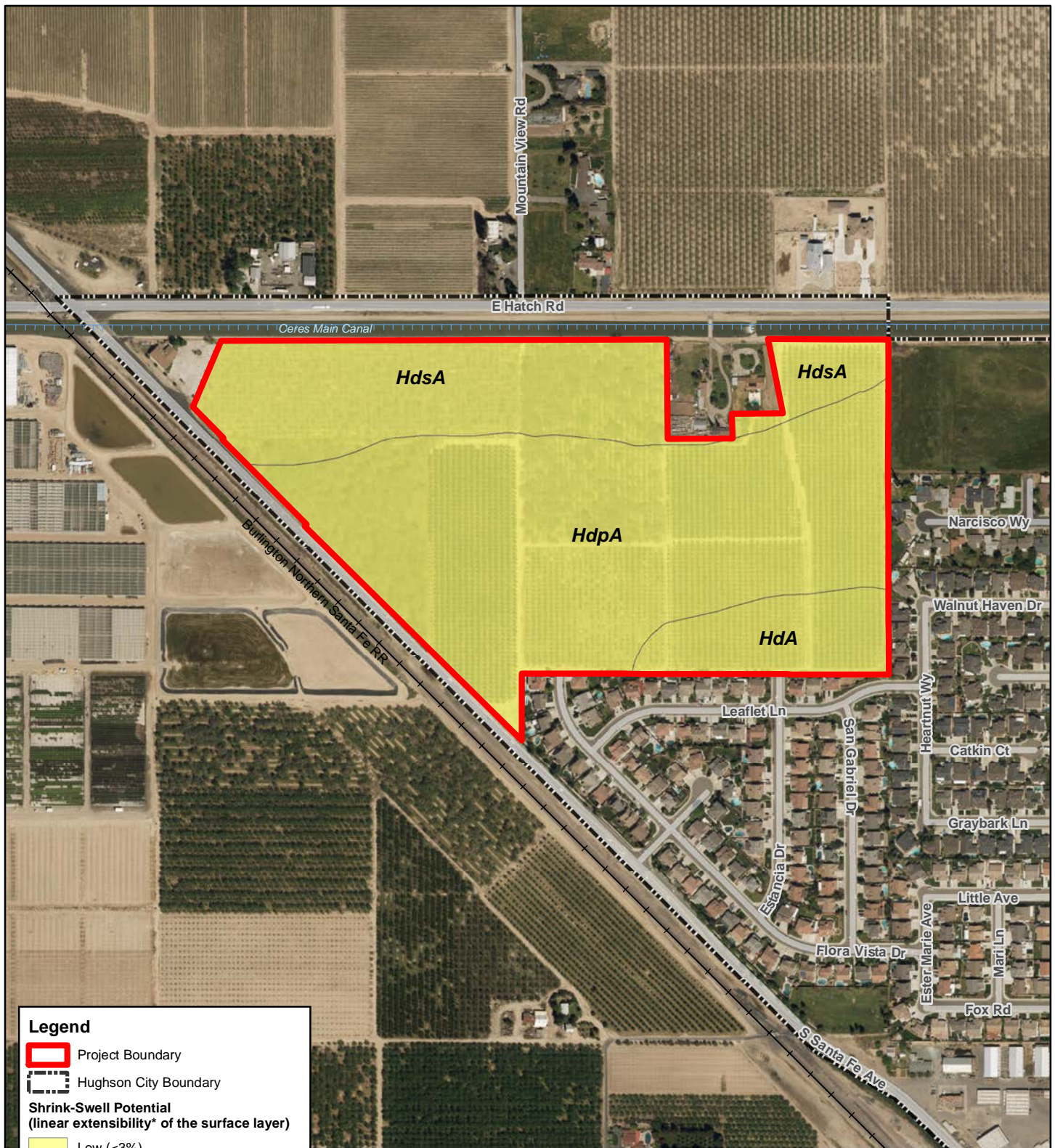
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### Legend

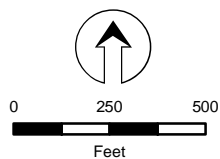
- Project Boundary
- Hughson City Boundary

### Shrink-Swell Potential (linear extensibility\* of the surface layer)

- Low (<3%)
- Moderate (3-6%)
- High (6-9%)
- Very High (>9%)

\*Shrink-Swell Potential is determined by linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Soils are considered to have low potential when the linear extensibility is less than 3%, moderate if 3-6%, high if 6-9%, and very high if greater than 9%.

Sources: NRCS Web Soil Survey, Eastern Stanislaus Area, California (CA644); Survey Area: Version 12, Sep 14, 2018, Tabular: Version 11, Sep 14, 2018, Spatial: Version 5, Sep 14, 2018. Map date: March 29, 2019.



### CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 11. Expansive Soils Map

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### VIII. GREENHOUSE GAS EMISSIONS

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?			X	

#### *Background*

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three greenhouse gases have increased globally by 40, 150, and 20 percent, respectively [Intergovernmental Panel on Climate Change [IPCC], 2013].

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), ozone (O<sub>3</sub>), water vapor, nitrous oxide (N<sub>2</sub>O), and chlorofluorocarbons (CFCs).

The emissions from a single project will not cause global climate change, however, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. Therefore, the analysis of GHGs and climate change presented in this section is presented in terms of the proposed project's contribution to cumulative impacts and potential to result in cumulatively considerable impacts related to GHGs and climate change.

Cumulative impacts are the collective impacts of one or more past, present, and future projects that, when combined, result in adverse changes to the environment. In determining the significance of a proposed project's contribution to anticipated adverse future conditions, a lead agency should generally undertake a two-step analysis. The first question is whether the *combined* effects from *both* the proposed project *and* other projects would be cumulatively significant. If the agency answers this inquiry in the affirmative, the second question is whether "the proposed project's *incremental* effects are cumulatively considerable" and thus significant in and of themselves. The cumulative project list for this issue (climate change) comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global



climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context and process for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and, therefore, significant.

### *Significance Thresholds*

Governor's Office of Planning and Research's (OPR's) Guidance does not include a quantitative threshold of significance to use for assessing a project's GHG emissions under CEQA. Moreover, the California Air Resources Board (CARB) has not established such a threshold or recommended a method for setting a threshold for project-level analysis. In the absence of a consistent statewide threshold, a threshold of significance for analyzing the project's GHG emissions was developed. The issue of setting a GHG threshold is complex and dynamic, especially in light of the California Supreme Court decision in *Center for Biological Diversity v. California Department of Fish and Wildlife* (referred to as the Newhall Ranch decision hereafter). The California Supreme Court ruling also highlighted the need for the threshold to be tailored to the specific project type, its location, and the surrounding setting. Therefore, the threshold used to analyze the project is specific to the analysis herein and the City retains the ability to develop and/or use different thresholds of significance for other projects in its capacity as lead agency and recognizing the need for the individual threshold to be tailored and specific to individual projects.

The SJVAPCD provides guidance for addressing GHG emissions under CEQA. The SJVAPCD guidance regarding evaluating GHG significance notes that if a project complies with an adopted statewide, regional, or local plan for reduction or mitigation of GHG emissions, then impacts related to GHGs would be less than significant. The applicable plan for reduction or mitigation of GHG emissions for the proposed project is the Hughson Climate Action Plan. Additionally, the SJVAPCD requires quantification of GHG emissions for all projects which the lead agency has determined that an EIR is required. Although an EIR is not required for the proposed project, the GHG emissions are quantified below, followed by a consistency analysis with the StanCOG Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) and the Hughson Climate Action Plan.

### *RESPONSES TO CHECKLIST QUESTIONS*

**Responses a) and b):** Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. Implementation of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO<sub>2</sub> and other GHG pollutants, such as CH<sub>4</sub> and N<sub>2</sub>O, from mobile sources and utility usage.

The proposed project's short-term construction-related and long-term operational GHG emissions for buildout of the proposed project, were estimated using CalEEMod™ (v.2016.3.2). CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use

projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO<sub>2</sub> equivalent units of measure (i.e., MTCO<sub>2</sub>e), based on the global warming potential of the individual pollutants.

### Short-Term Construction GHG Emissions

Estimated increases in GHG emissions associated with construction of the proposed project are summarized in Table 11.

**Table 11: Construction GHG Emissions (Unmitigated Metric Tons/Yr)**

<i>Year</i>	<i>Bio-CO<sub>2</sub></i>	<i>NBio-CO<sub>2</sub></i>	<i>Total CO<sub>2</sub></i>	<i>CH<sub>4</sub></i>	<i>N<sub>2</sub>O</i>	<i>CO<sub>2</sub>e</i>
2020	0.0000	404.6950	404.6950	0.1234	0.0000	407.7808
2021	0.0000	511.6666	511.6666	0.0840	0.0000	513.7676
2022	0.0000	505.3103	505.3103	0.0827	0.0000	507.3766
2023	0.0000	499.2345	499.2345	0.0794	0.0000	501.2184
2024	0.0000	498.8534	498.8534	0.0794	0.0000	500.8390
2025	0.0000	192.9722	192.9722	0.0409	0.0000	193.9955
<b>Maximum</b>	<b>0.0000</b>	<b>511.6666</b>	<b>511.6666</b>	<b>0.1234</b>	<b>0.0000</b>	<b>513.7676</b>

SOURCE: CALFEEMOD (v.2016.3.2).

As presented in the table, maximum short-term annual construction emissions of GHG associated with development of the project are estimated to be 513.7676 MTCO<sub>2</sub>e (2021) with a low of 193.9955 MTCO<sub>2</sub>e (2025) emitted. These construction GHG emissions are a one-time release and are comparatively much lower than emissions associated with operational phases of a project. Cumulatively, these construction emissions would not generate a significant contribution to global climate change.

### Long-Term Operational GHG Emissions

The long-term operational GHG emissions estimate for buildout of the proposed project, incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation. The modeling included mitigation inputs for the year 2021 including the following:

#### Traffic Mitigation

- Project Setting: Low Density Suburban
- Increase Density: 299 du/56.04 ac = 5.34 du/ac
- Increase Destination Accessibility: Distance to Downtown/Job Center is 0.95 miles (from project site to downtown Hughson)
- Increase Transit Accessibility: Distance to Transit is 0.78 miles (Stanislaus Regional Transit [StaRT] Stop 110 at 3rd and Hughson)
- Improve Pedestrian Network: Project Site and Connecting Off-Site (project includes connections from the site to the adjacent residential subdivisions to the south and a multi-se path along the TID canal)

Area Mitigation

- Only Natural Gas Hearth (Per SJVAPCD Rule 4901: Wood-Burning Fireplaces and Wood-Burning Heaters, open-hearth fireplaces are not allowed in new construction projects which would result in more than two homes per acre. The proposed project includes more than two homes per acre.)

Estimated GHG emissions associated with the buildout of the proposed project with and without the above mitigation incorporated are summarized in Tables 12 and 13. As shown in the tables, the annual GHG emissions associated with buildout of the proposed project would be 5,695.6235 MTCO<sub>2</sub>e with the above referenced mitigation incorporated and 5,984.9863 MTCO<sub>2</sub>e without mitigation. The mitigation results in a decrease of 289.3628 MTCO<sub>2</sub>e.

**Table 12: Operational GHG Emissions 2021 (Unmitigated Metric Tons/Yr)**

Category	Bio-CO <sub>2</sub>	NBio-CO <sub>2</sub>	Total CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
Area	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131
Energy	0.0000	761.7363	761.7363	0.0425	0.0148	767.2012
Mobile	0.0000	4,833.9062	4,833.9062	0.3204	0.0000	4,841.9168
Waste	78.9716	0.0000	78.9716	4.6671	0.0000	195.6488
Water	6.1804	19.5205	25.7009	0.6367	0.0154	46.2065
<b>Total</b>	<b>85.1520</b>	<b>5,748.3185</b>	<b>5,833.4705</b>	<b>5.6727</b>	<b>0.0325</b>	<b>5,984.9863</b>

SOURCE: CALEEMOD (v.2016.3.2).

**Table 13: Operational GHG Emissions 2021 (Mitigated Metric Tons/Yr)**

Category	Bio-CO <sub>2</sub>	NBio-CO <sub>2</sub>	Total CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
Area	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131
Energy	0.0000	755.1243	755.1243	0.0418	0.0146	760.5319
Mobile	0.0000	4,551.3880	4,551.3880	0.3134	0.0000	4,559.2232
Waste	78.9716	0.0000	78.9716	4.6671	0.0000	195.6488
Water	6.1804	19.5205	25.7009	0.6367	0.0154	46.2065
<b>Total</b>	<b>85.1520</b>	<b>5,459.1882</b>	<b>5,544.3403</b>	<b>5.6650</b>	<b>0.0324</b>	<b>5,695.6235</b>

SOURCE: CALEEMOD (v.2016.3.2).

**StanCOG Regional Transportation Plan/Sustainable Communities Strategy**

StanCOG adopted the RTP/SCS on August 15, 2018. The RTP/SCS was developed by StanCOG in accordance with state and federal requirements, including SB 375, and reflects the collective regional goals and priorities of the Stanislaus region. The RTP/SCS serves as a guide for transportation investment and land use across Stanislaus County throughout 2042. It presents a roadmap for accommodating anticipated growth and development and identifies a transportation investment strategy for achieving regional goals that link air quality, land use, and transportation.

Appendix L of the RTP/SCS contains goals and performance measures which provide the necessary information to permit public and elected officials within the region to make informed decisions on the direction of the RTP/SCS. One of the goals in Appendix L of the StanCOG RTP/SCS aims to increase mobility and access. The performance measures for this goal include, but are not limited to, providing housing within walking distance to transit and increasing the share of



bicycle and pedestrian trips. StaRT Route 61 currently has a stop at 3<sup>rd</sup> Street and Hughson Avenue (Stop ID #110). This stop is located approximately 0.78 miles from the project site. Route 61 operates Monday through Friday between 6:15 AM and 7:45 PM. This bus operates seven round trips between Modesto, Empire, Waterford, Hickman, Hughson and Ceres. On Saturday between 7:30 a.m. and 7:00 p.m., six round trips are provided. Therefore, the proposed project would be located in an area that is currently served by StaRT. Additionally, the project would not result in impacts to pedestrian, bicycle, or transit facilities. The project would provide bikeways and sidewalks internal to the site which would connect to adjacent off-site roadways. Further, a paved bike and walking/jogging path (Class I Bike Trail) would be provided along the TID Ceres canal as part of the proposed project.

As demonstrated above, the proposed project would be generally consistent with the goals and performance measures of the RTP/SCS.

### **Hughson Climate Action Plan**

Hughson, like many other jurisdictions in the state, is addressing climate change at the local level by preparing a Climate Action Plan. One of the primary goals of the Hughson Climate Action Plan is to identify strategies to reduce the contribution of the community and municipal operations to GHG emissions. By using energy more efficiently, enhancing access to other modes of transportation, recycling waste, and conserving water, Hughson will be able to keep more dollars within the local economy, create new green jobs, as well as improve public health and the quality of life.

Chapter 4 of the Climate Action Plan outlines the goals and strategies to reduce GHG emissions. Two of the transportation goals are to increase non-motorized travel and improve public transit. As noted above, the proposed project would be located in an area that is currently served by StaRT. The project would also provide bicycle and pedestrian facilities that connect to off-site roadways.

One of the land use goals is to promote sustainable growth patterns, including smaller lots for detached homes to shorten vehicle trip distances, and redevelopment of strategically located underused parcels within proximity to existing services and amenities. The proposed project includes "Park Home Lots", which would include traditional residential lots of approximately 5,005 sf to 13,280 sf, and "Courtyard Home Lots", which would include lots of approximately 5,250 sf with a shared driveway (motor court) between a cluster of lots. The project would include 99 Park Homes and 200 Courtyard Homes. The smaller lots for the proposed detached homes allow for maximization of the subject property. Additionally, the project site is located within an area of the City where urban services are already available.

As demonstrated above, the proposed project would be generally consistent with the goals and strategies of Hughson Climate Action Plan.

### **Conclusion**

The maximum short-term annual construction emissions of GHG associated with development of the project are estimated to be 513.7676 MTCO<sub>2</sub>e (2021) with a low of 193.9955 MTCO<sub>2</sub>e (2025) emitted. As stated previously, short-term construction GHG emissions are a one-time release of GHGs and are not expected to significantly contribute to global climate change over the lifetime of the proposed project. The annual operational GHG emissions associated with buildout of the proposed project would be 5,695.6235 MTCO<sub>2</sub>e with the above referenced mitigation

incorporated and 5,984.9863 MTCO<sub>2</sub>e without mitigation. The mitigation results in a decrease of 289.3628 MTCO<sub>2</sub>e.

Additionally, the project would be generally consistent with the goals and performance measures of the RTP/SCS and Hughson Climate Action Plan. Therefore, impacts related to GHG emissions and global climate change would be considered *less than significant*.

**IX. HAZARDS AND HAZARDOUS MATERIALS**

<b><i>Would the project:</i></b>	<b><i>Potentially Significant Impact</i></b>	<b><i>Less Than Significant with Mitigation Incorporation</i></b>	<b><i>Less Than Significant Impact</i></b>	<b><i>No Impact</i></b>
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
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?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which 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?			X	
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?			X	
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

***Responses to Checklist Questions***

**Responses a), b):** The proposed project would place residential uses in an area of the City that currently contains residential and institutional uses. The proposed residential land uses do not routinely transport, use, or dispose of hazardous materials, or present a reasonably foreseeable release of hazardous materials, with the exception of common hazardous materials such as household cleaners, paint, etc. The operational phase of the proposed project does not pose a significant hazard to the public or the environment.

Onsite reconnaissance and historical records indicate that there are no known underground storage tanks or pipelines located on the project site that contain hazardous materials. Therefore, the disturbance of such items during construction activities is unlikely. Construction equipment and materials would likely require the use of petroleum based products (oil, gasoline, diesel fuel), and a variety of common chemicals including paints, cleaners, and solvents. Transportation, storage, use, and disposal of hazardous materials during construction activities would be required to comply with applicable federal, state, and local statutes and regulations. Compliance

would ensure that human health and the environment are not exposed to hazardous materials. Therefore, the proposed project would have a ***less than significant*** impact relative to this issue.

**Response c):** The project site is located within ¼ mile of an existing school. The closest school is Hughson Christian School which is located approximately 0.15 miles or further east of the site. Although the site is within the ¼-mile radius of a school, the operations of a residential subdivision would not emit hazardous emissions or result in the storage or handling of hazardous or acutely hazardous materials, substances or waste above the level of existing conditions. Implementation of the proposed project would result in a ***less than significant*** impact relative to this topic.

**Response d):** According the California Department of Toxic Substances Control (DTSC) there are no Federal Superfund Sites, State Response Sites, or Voluntary Cleanup Sites on, or in the near vicinity of the project site. The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. The nearest investigation sites include:

- Dairy Farmers of America Case #1 AKA Foremost (site T0609900009): This site is a LUST Cleanup Site which has a current status of Completed – Case Closed as of November 3, 1986. The site had potential soil contamination of gasoline, other solvents, or non-petroleum hydrocarbons. This site is located approximately 0.72 miles southeast of the project site.
- Quick and Save/Hughson Exxon (site T0609900033): This site is a LUST Cleanup Site which has a current status of Completed – Case Closed as of August 26, 1997. The site had potential soil contamination of gasoline. This site is located approximately 0.71 miles southeast of the project site.

Implementation of the proposed project would result in a ***less than significant*** impact relative to this environmental topic.

**Response e):** The Federal Aviation Administration (FAA) establishes distances of ground clearance for take-off and landing safety based on such items as the type of aircraft using the airport. The project site is not located within the vicinity of a private airstrip or public airport. The closest airport or airstrip is the Oakdale Airport, located approximately 10.7 miles north of the project site. Implementation of the proposed project would have a ***less than significant*** impact with regards to this environmental issue.

**Response f):** The Office of Emergency Services (OES) maintains an Emergency Operations Plan (EOP) that serves as the official Emergency Plan for Stanislaus County. The EOP is based on the National Incident Management System and its component parts, along with the California Standardized Emergency Management System, including the five functional areas of incident or event management, operational coordination, planning, logistical support, and finance/administration support. The EOP serves as the basis for response as well as recovery efforts and activities within the County.

The EOP also identifies Emergency Support Functions that represent core emergency response categories performed by agencies and jurisdictions with primary and supporting responsibilities within Stanislaus County. These may include public and non-government organizations. These Emergency Support Functions are based on the State of California's Emergency Function Annexes and the Federal Emergency Support Function Annexes.

The County OES also prepared a Hazardous Materials Area Plan (Chapter 4 of Division 2, Title 19, Article 3, §2720-2728 of the California Code of Regulations) and (California Health and Safety Code, Division 20, Chapter 6.95, Section 25503.5) that describes the hazardous materials response system developed to protect public health, prevent environmental damage and ensure proper use and disposal of hazardous materials. The plan establishes effective response capabilities to contain and control releases, establishes oversight of long-term cleanup and mitigation of residual releases, and integrates multi-jurisdiction and agency coordination. This plan is implemented by the Stanislaus County Division of Environmental Resources.

The Stanislaus County Office of Emergency Services also maintains a Hazardous Materials Business Plan (HMBP). The HMBP describes agency roles, strategies and processes for responding to emergencies involving hazardous materials.

In Stanislaus County, all major roads are available for evacuation, depending on the location and type of emergency that arises. The main evacuation route through Riverbank is SR 108. This roadway is capable of handling heavy truck traffic, as well as traffic from passenger vehicles and would be a primary route for evacuations. The proposed project does not include any actions that would impair or physically interfere with any of Stanislaus County's emergency plans or evacuation routes. Future uses on the project site will have access to the County resources that establish protocols for safe use, handling and transport of hazardous materials. Construction activities are not expected to result in any unknown significant road closures, traffic detours, or congestion that could hinder the emergency vehicle access or evacuation in the event of an emergency. Implementation of the proposed project would have a ***less than significant*** impact with regards to this environmental issue.

**Response g):** The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The City has areas with an abundance of flashy fuels (i.e., grassland) in the outlying residential parcels and open lands that, when combined with warm and dry summers with temperatures often exceeding 100 degrees Fahrenheit, create a situation that results in higher risk of wildland fires. Most wildland fires are human caused, so areas with easy human access to land with the appropriate fire parameters generally result in an increased risk of fire.

The City of Hughson is not categorized as a "Very High" Fire Hazard Severity Zone (FHSZ) by CalFire. The City of Hughson contains areas with "moderate" and "non-wildland fuel" ranks. The areas warranting "moderate" fuel ranks possess combustible material in sufficient quantities combined with topographic characteristics that pose a wildfire risk. CalFire data for the areas immediately surrounding the Planning Area also include "moderate" and "non-wildland fuel" ranks.

The site is not located on a steep slope, and the site is essentially flat. The project site is also located in an urban area, with existing or future urban development located on all sides. The project will comply with city standards for fire hydrants and fire sprinklers, and access to and from the project site is sufficient. Therefore, this is a ***less than significant*** impact and no mitigation is required.



*X. HYDROLOGY AND WATER QUALITY*

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			X	
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:		X		
(i) Result in substantial erosion or siltation on- or off-site;			X	
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			X	
(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			X	
(iv) Impede or redirect flood flows?			X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			X	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?		X		

*Responses to Checklist Questions*

**Response a):** Implementation of proposed project would not violate any water quality or waste discharge requirements. Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific SWPPP to be prepared for each project that disturbs an area one acre or larger. The SWPPP is required to include project specific best management measures that are designed to control drainage and erosion. Mitigation Measure GEO-2 would require the preparation of a SWPPP to ensure that the proposed project prepares and implements a SWPPP throughout the construction phase of the project. Furthermore, the proposed project includes a preliminary grading and drainage plan that has a specific drainage plan designed to control storm water runoff and erosion, both during and after construction. The SWPPP (Mitigation Measure Geo-3) and the project specific drainage plan would reduce the potential for the proposed project to violate water quality standards during construction. Implementation of the proposed project would result in a *less-than-significant* impact relative to this topic.

**Response b):** The proposed project would connect to the City of Hughson water system. The water supply for the proposed project would be local groundwater. The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). The City of Hughson General Plan designates the project site for LDR, MDR, and SC uses. Therefore, the City's General Plan anticipated up to 344 residential units (with an associated population of 1,190 persons) and 413,730 square feet of SC within the project area.

Project construction would add additional impervious surfaces to the project site; however, various areas of the project site would remain largely pervious, which would allow infiltration to underlying groundwater. For example, the project proposes to include two large drainage basins and various bio-retention areas throughout the landscaped portions of the project site. Additionally, the project includes ample landscaping areas that would remain pervious. The proposed back and front yards of the residences may also remain pervious. These areas would continue to contribute to groundwater recharge following construction of the project. Furthermore, the project is not anticipated to significantly affect groundwater quality because sufficient stormwater infrastructure would be constructed as part of project to detain and filter stormwater runoff and prevent long-term water quality degradation. Therefore, project construction and operation would not substantially deplete or interfere with groundwater supply or quality. This impact would be *less than significant*.

**Responses c), e):** When land is in a natural or undeveloped condition, precipitation will infiltrate/percolate the soils and mulch. Much of the rainwater that falls on natural or undeveloped land slowly infiltrates the soil and is stored either temporarily or permanently in underground layers of soil. When the soil becomes completely soaked or saturated with water or the rate of rainfall exceeds the infiltration capacity of the soil, the rainwater begins to flow on the surface of land to low lying areas, ditches, channels, streams, and rivers. Rainwater that flows off of a site is defined as storm water runoff. When a site is in a natural condition or is undeveloped, a larger percentage of rainwater infiltrates into the soil and a smaller percentage flows off the site as storm water runoff.

The infiltration and runoff process is altered when a site is developed with urban uses. Houses, buildings, roads, and parking lots introduce asphalt, concrete, and roofing materials to the landscape. These materials are relatively impervious, which means that they absorb less rainwater. As impervious surfaces are added to the ground conditions, the natural infiltration process is reduced. As a result, the volume and rate of storm water runoff increases. The increased volumes and rates of storm water runoff can result in flooding in some areas if adequate storm drainage facilities are not provided.

There are no rivers, streams, or water courses located on or immediately adjacent to the project site. As such, there is no potential for the project to alter a water course, which could lead to on or offsite flooding. Drainage improvements associated with the project site would be located on the project site, and the project would not alter or adversely impact offsite drainage facilities.

The proposed project would require the installation of storm drainage infrastructure to ensure that storm waters properly drain from the project site. The project includes two park/dual use areas: one in the eastern portion of the subdivision (1.33 acres), and one in the western portion of the subdivision (3.20 acres). These two park areas would also grass retention basin areas for storm drain purposes. Additionally, various bio-retention areas would be located throughout the

project site. The storm drainage plan was designed and engineered to ensure proper construction of storm drainage infrastructure to control runoff and prevent flooding, erosion, and sedimentation.

The ongoing operational phase of the proposed project requires the final discharge of stormwater into the on-site retention basins. The discharge of stormwater must be treated through BMPs prior to its discharge. Section 7 of the City's Improvement Standards establish minimum storm water management requirements and controls. According to the standards, storm drain discharges must include stormwater quality control measures, and stormwater generated must be adequately treated before discharge. Structural and non-structural stormwater management systems and BMPs are required. Additionally, new developments are required to prepare and submit a Stormwater Management Plan for the City's review, which include design calculations to ensure 10-year, 24-hour, and 100-year duration storms can be accommodated. The City's Improvement Standards also include requirements for detention basins, pipeline sizing and drain inlets, and other related topics.

The proposed retention basins have been sized to accommodate 10-year, 24-hour, and 100-year duration storms. Nevertheless, as required by the City's Improvement Standards, Mitigation Measure HYDRO-1 will require that the Stormwater Management Plan be designed to ensure that post-project runoff is equal to or less than pre-project runoff. The storm drainage plan will require the construction of storm water drainage facilities on the project site, as proposed; however, the construction of these facilities would not substantially alter the existing drainage pattern of the area, or alter the course of a stream or river. Implementation of the proposed project with the following mitigation measure would have a ***less-than-significant*** impact relative to this environmental topic.

#### *Mitigation Measure(s)*

**Mitigation Measure HYDRO-1:** *The Stormwater Management Plan shall be designed and engineered to ensure that post-project runoff is equal to or less than pre-project runoff. The Plan shall be consistent with Section 7 of the City's Improvement Standards, which establish minimum storm water management requirements and controls. According to the standards, storm drain discharges must include stormwater quality control measures, and stormwater generated must be adequately treated before discharge. The applicant shall provide the City Engineer with all stormwater runoff calculations with the improvement plan submittal.*

**Response d):** As shown in Figure 12, the project site is located within Flood Zone X, which is not within the 100-year or 500-year flood zone as shown on the Flood Insurance Rate Map (FIRM).

As shown in Figure 12, the project site is located within a dam inundation area for the Don Pedro Dam. Dam failure is generally a result of structural instability caused by improper design or construction, instability resulting from seismic shaking, or overtopping and erosion of the dam. Larger dams that are higher than 25 feet or with storage capacities over 50 acre-feet of water are regulated by the California Dam Safety Act, which is implemented by the California Department of Water Resources, Division of Safety of Dams (DSD). The DSD is responsible for inspecting and monitoring these dams. The Act also requires that dam owners submit to the California Office of Emergency Services inundation maps for dams that would cause significant loss of life or personal injury as a result of dam failure. The County Office of Emergency Services is responsible for developing and implementing a Dam Failure Plan that designates evacuation plans, the direction of floodwaters, and provides emergency information.

Regular inspection by DSD and maintenance by the dam owners ensure that the dams are kept in safe operating condition. As such, failure of these dams is considered to have an extremely low probability of occurring and is not considered to be a reasonably foreseeable event.

The proposed project would not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a levee or dam.

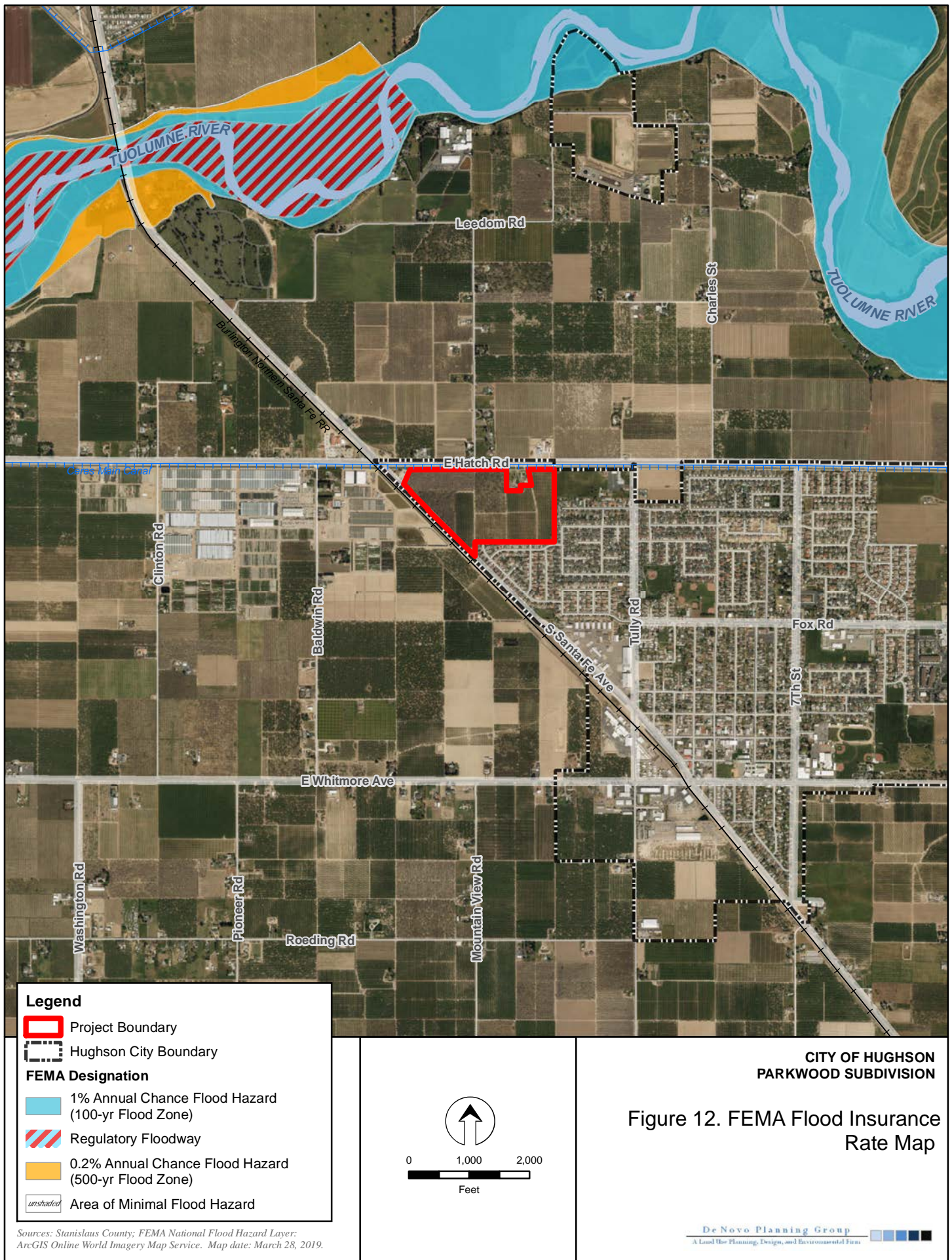
The project site is not anticipated to be inundated by a tsunami because it is located at an elevation of 120 to 140 feet above sea level and is approximately 67 miles away from the Pacific Ocean which is the closest ocean waterbody.

The project site is not anticipated to be inundated by a seiche because it is not located in close proximity to a water body capable of creating a seiche.

Implementation of the proposed project would have a ***less than significant*** impact relative to flood hazards, seiches, and tsunamis.

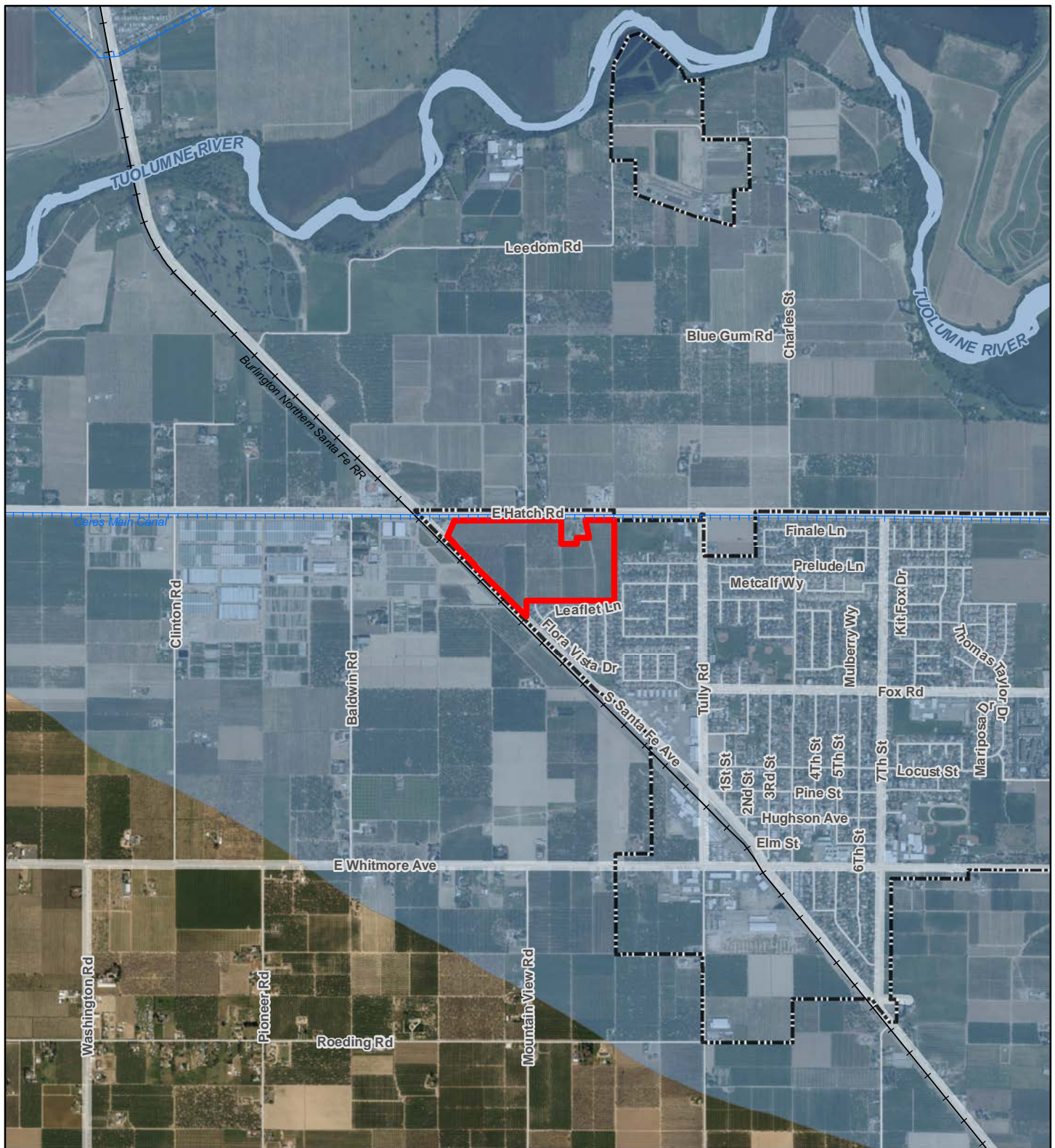
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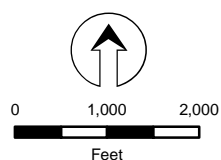
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### Legend

- Project Boundary
- Hughson City Boundary
- Don Pedro Dam Inundation Area
- ||||| Canal
- + + + Railroad

Sources: Stanislaus County; Cal OES; ArcGIS Online  
World Imagery Map Service. Map date: March 28, 2019.



### CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 13. Dam Inundation Map

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## XI. LAND USE AND PLANNING

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Physically divide an established community?			X	
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?			X	

### *Responses to Checklist Questions*

**Response a):** The project site is located within the Hughson city limits and is adjacent primarily to residential uses, a church, and vacant agricultural land. The proposed residential subdivision is consistent with the surrounding uses to the east and south and would not physically divide an established community. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** The key planning documents that are directly related to, or that establish a framework within which the proposed project must be consistent, include:

- City of Hughson General Plan; and
- City of Hughson Zoning Ordinance.

The project site is currently designated LDR (approximately 19.28 acres), MDR (approximately 17.73 acres), and SC (approximately 19.00 acres) by the City's General Plan land use map. The project site is currently zoned R-1 (approximately 19.28 acres), R-2 (approximately 17.73 acres), and C-2 (approximately 19.00 acres) by the City's zoning map.

The land uses as proposed are not consistent with the General Plan. When land uses are not consistent with a General Plan there are two courses of action: 1) the uses are not allowed due to the inconsistency, or 2) the land uses are changed through an amendment to the General Plan to create consistency. The proposed project would require a General Plan Amendment to change the LDR and SC land uses to MDR. The MDR designation promotes a mixture of single-family houses, duplexes, triplexes, fourplexes and townhouses within the same neighborhood. This category is designed to provide a transition between higher density multi-family and commercial development and low density, single family neighborhoods. The designation also ensures that there will be a variety of housing types in Hughson, which is consistent with the traditional character of the community. Allowable densities range from 5.1 to 14.0 dwelling units per gross acre. The maximum density may be increased by up to 25 percent under the Planned Development process, as part of legally-required affordable density bonuses. With 299 units on 56.04 acres, the proposed density would be 5.34 dwelling units per acre, which is within the allowed density range.

Approval of the General Plan amendment would ensure that the proposed project would be substantially consistent with the Riverbank General Plan land use requirements.

Similarly, the land uses as proposed are not consistent with the current zoning for the site. The proposed project would require a rezone to change the R-1 and C-2 land uses to R-2. Approval of the rezone would ensure that the proposed project would be consistent with the Zoning Code.

Overall, impacts to land use compatibility would be ***less than significant***.

## XII. MINERAL RESOURCES

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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?				X
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?				X

### *Responses to Checklist Questions*

**Response a):** There are no significant deposits of mineral resources located on the project site, as delineated by the Mineral Resources and Mineral Hazards Mapping Program (MRMHMP). The project site is not designated as a Mineral Resource Zone (MRZ). Additionally, there are no oil and gas extraction wells within or near the property. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response b):** The project site does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. As noted above, known mineral resources that would be of value to the region no longer exist within the project site. The proposed project would not result in loss of a mineral resource. Implementation of the proposed project would have ***no impact*** relative to this issue.



### XIII. NOISE

<i>Would the project result in:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Generation of excessive groundborne vibration or groundborne noise levels?		X		
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?				X

#### EXISTING SETTING

The following is based on the *Environmental Noise Assessment* that was completed for the project by Saxelby Acoustics (April 2020).

#### Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large range of numbers. The decibel (dB) scale is used to facilitate graphical visualization of large ranges of numbers. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a graphically practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels and are expressed in units of dBA, unless otherwise noted.



The decibel scale is logarithmic, not linear. In other words, two sound power levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to  $L_{dn}$ , but includes a +5 dBA penalty for evening noise. Typically CNEL and  $L_{dn}$  values are within 0.5 dBA of each other and are often considered to be synonymous. Table 14 lists several examples of the noise levels associated with common situations.

**Table 14: Typical Noise Levels**

<i>Common Outdoor Activities</i>	<i>Noise Level (dBA)</i>	<i>Common Indoor Activities</i>
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office
Quiet Urban Nighttime	--40--	Theater, Large Conference Room
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. NOVEMBER 2009.

### *Effects of Noise on People*

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dBA per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

### *Existing Noise Levels – Background Noise*

To quantify the existing ambient noise environment in the project vicinity, short-term and continuous (24-hour) noise level measurements were conducted on the project site on March 28<sup>th</sup> and 29<sup>th</sup>, 2019. The noise measurement locations are shown on Figure 14. The noise level measurement survey results are provided in Table 15. Appendix A of Appendix B shows the complete results of the noise monitoring survey.

The sound level meters were programmed to collect hourly noise level intervals at each site during the survey. The maximum value ( $L_{max}$ ) represents the highest noise level measured during an interval. The average value ( $L_{eq}$ ) represents the energy average of all of the noise measured during an interval. The median value ( $L_{50}$ ) represents the sound level exceeded 50 percent of the time during an interval.

Larson Davis Laboratories (LDL) Model 820, Model 812, and Model 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

Measurements of train events on the project site at measurement location LT-1 were also performed. Measurements were conducted over a 24-hour period using a LDL Model 820 sound meter at a distance of 190 feet from the centerline of the BNSF railroad line. Based upon the noise

monitoring conducted at this location, approximately 35 train events were observed in a 24-hour period, with six of the trains occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The day/night average noise level for trains was found to be 72 dB  $L_{dn}$  at the measurement site. The 60 dBA  $L_{dn}$  railroad noise contour, which is the City's normally acceptable noise standard, extends to an approximate distance of 1,186 feet from the railroad centerline.

**Table 15: Summary of Existing Background Noise Measurement Data**

Site	Location	Date / Time	L <sub>DN</sub>	Average Measured Hourly Noise Levels, dB					
				Daytime (7am-10pm)			Nighttime (10pm-7am)		
				L <sub>EQ</sub>	L <sub>50</sub>	L <sub>MAX</sub>	L <sub>EQ</sub>	L <sub>50</sub>	L <sub>MAX</sub>
Continuous (24-hour) Noise Level Measurements									
LT-1	290-ft. to centerline of E. Hatch Rd. 105-ft. to centerline of Santa Fe Ave. 190-ft. to centerline of railroad.	03/28/19-03/29/19	73	68	56	92	66	50	81
LT-2	215-ft. to centerline of E. Hatch Rd.	03/28/19-03/29/19	62	57	54	75	55	50	71
LT-3	360-ft. to centerline of Santa Fe Ave.	03/28/19-03/29/19	65	60	51	81	59	48	73
Short-Term Noise Level Measurements									
ST-1	150-ft. to centerline of E. Hatch Rd.	03/29/19 11:19 AM	NA	60	50	76	Primary noise source is traffic on E Hatch Rd.		
ST-2	1,480-ft. to centerline of Santa Fe Ave.	03/28/19 10:32 AM	NA	49	39	68	Primary noise source is traffic on Santa Fe Ave.		

SOURCE: SAXELBY ACOUSTICS, 2020.

Continuous (24-hour) noise levels at site LT-1 were measured, which was located approximately 105 feet from the centerline of Santa Fe Avenue. At this location, the total measured noise level was found to be 73.0 dBA  $L_{dn}$ . The total noise exposure at this location is due primarily to trains on the BNSF rail line which were measured to be 72.0 dBA  $L_{dn}$ . The predicted traffic noise level for Santa Fe Avenue at LT-1 (105 feet from Santa Fe Avenue centerline) is 63.2 dBA  $L_{dn}$ . Using decibel addition, the total noise exposure considering both traffic and railroad noise is 72.5 dBA. This is accurate within 0.5 dBA of the total noise exposure measured at site LT-1. This is well within the industry accepted tolerance of 3 dBA as required by Caltrans for highway noise predictions.

Continuous (24-hour) noise levels at site LT-2 were also measured, which was located approximately 215 feet from the centerline of Hatch Road. At this location, the total measured noise level was found to be 61.9 dBA  $L_{dn}$ . The total noise exposure at this location is due to trains on the BNSF rail line and traffic on E. Hatch Road. Train noise at this location was measured to be 59.4 dBA  $L_{dn}$ . The predicted traffic noise level for E. Hatch Road at LT-2 (215 feet from E. Hatch Road centerline) is 59.2 dBA  $L_{dn}$ . Using decibel addition, the total noise exposure considering both traffic and railroad noise is 62.3 dBA. This is accurate within 0.4 dBA of the total noise exposure measured at site LT-2. This is well within the industry accepted tolerance of 3 dBA as required by Caltrans for highway noise predictions.

#### *Existing Noise Levels – Traffic Noise*

To predict existing noise levels due to traffic, the FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop  $L_{dn}$  (24-hour average) noise contours for the primary

project-area roadways. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly  $L_{eq}$  values for free-flowing traffic conditions. While the newer FHWA traffic noise model (TNM 3.0) is required for use on federally funded highway projects, the FHWA RD-77-108 model is still widely used in the industry and recognized as an accurate screening tool, typically resulting in slight over-predictions in traffic noise levels at typical receptor setback distances.

Traffic volumes for existing conditions were obtained from the traffic data prepared for the project (Fehr & Peers, 2019). Truck percentages and vehicle speeds on the local area roadways were estimated from field observations and feedback from the City.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. Where traffic noise barriers are predominately along a roadway segment, a -5 offset was added to the noise prediction model to account for various noise barrier heights. A -5 to dB offset was also applied where outdoor activity areas are shielded by intervening buildings. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this section.

Table 16 shows the existing traffic noise levels in terms of  $L_{dn}$  at closest sensitive receptors along each roadway segment. A complete listing of the FHWA Model input data is contained in Appendix B of Appendix B. It should be noted that the distances shown in Table 16 are measured from the roadway centerline to the center of the outdoor area of the closest typical residential setback.

**Table 16: Existing Traffic Noise Levels**

<b>Roadway</b>	<b>Segment</b>	<b>Approx. Receptor Distance, feet</b>	<b>Exterior Traffic Noise Level, dB <math>L_{DN}</math></b>
Hatch Rd.	Santa Fe Ave.to Tully Rd.	70	67.2
Tully Rd.	Hatch Rd.to Narcisco Way	45	57.8
Santa Fe Ave.	Hatch Rd. project access	100	63.2
Santa Fe Ave.	Project access to Los Alamos Dr.	50	62.8
Walnut Haven Dr.	Heartnut Way to Tully Rd.	45	51.0
Graybark Ln.	Heartnut Way to Tully Rd.	45	52.5
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	40	50.0
Flora Vista Dr.	Project site to Los Alamos Dr.	40	52.1
Estancia Dr.	Leaflet Ln. to Flora Vista Dr.	40	45.1
Flora Vista Dr.	Estancia Dr.to Ester Marie Dr.	40	54.1
Fox Rd.	Ester Marie Ave.to Tully Rd.	40	54.9

NOTE: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.

SOURCES: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND SAXELBY ACOUSTICS. 2020.

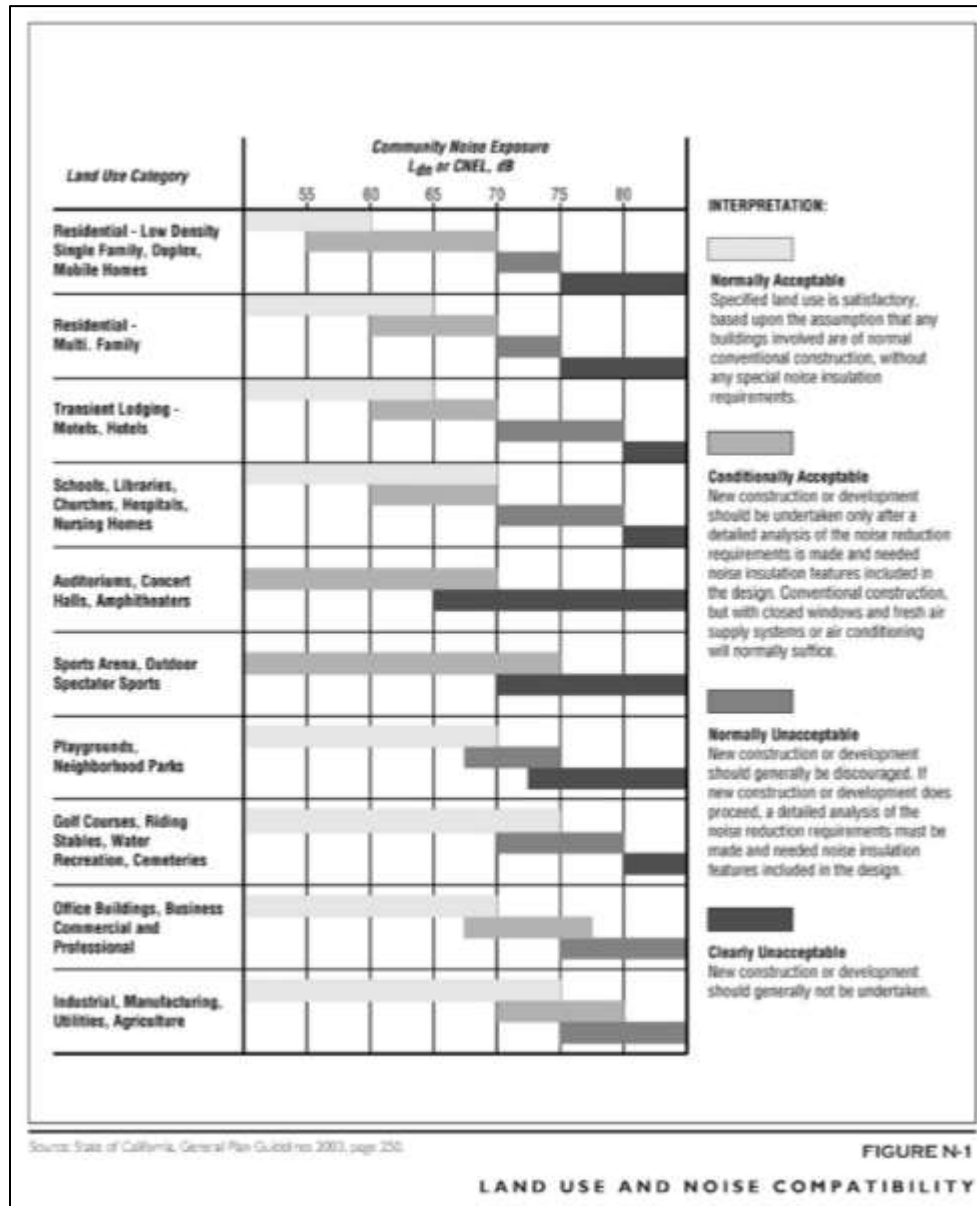
### *Regulatory Setting – Hughson General Plan*

The City of Hughson General Plan Noise Element includes the following goals, policies, and actions regarding noise that are applicable to the proposed project:

**Goal N-1** Minimize the exposure of community residents to excessive noise.

**Policy N-1.1** The City will utilize the noise/land use compatibility standards in Figure N-1 [Table 17] as a guide for future planning and development decisions, as well as the projected future noise contours for the buildout of the General Plan, shown in Figure N-2 and detailed in Table N-2.

**Table 17: City of Hughson General Plan Noise Element Land Use and Noise Compatibility**



SOURCE: CITY OF HUGHSON GENERAL PLAN NOISE ELEMENT.

**Policy N-1.2** The City will maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources, to the extent feasible.

**Policy N-1.3** New development of residential or other noise sensitive land uses should not be allowed in noise impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels in outdoor activity areas to 60 dB  $L_{dn}$  or less. Interior levels should be reduced to 45dB  $L_{dn}$  or less in all new residential developments.

**Policy N-1.4** The City should require new development deemed to be noise generators to minimize noise at the source through site design, building design, landscaping, hours of operation and other techniques.

**Policy N-1.5** During all phases of construction activity, the City will require project developers to incorporate mitigation measures that minimize the exposure of neighboring properties to excessive noise levels.

**Action N-1.1** Enforce the Hughson Noise Ordinance to avoid unnecessary and unusual noise during the hours of 10 p.m. to 7 a.m. Monday through Friday, and 10 p.m. to 8 a.m. Saturday, Sunday and holidays.

**Action N-1.2** Require acoustical analyses for proposed sensitive land uses to be located within the 60 dB  $L_{dn}$  noise contour, or in the vicinity of existing and proposed commercial and industrial areas. Acoustical analyses will also be required for commercial and industrial uses proposed in the vicinity of existing or proposed sensitive land uses. Where the noise analyses indicate that the noise compatibility standards contained in the Noise Element will be exceeded, require noise control measures to be incorporated into the proposed development to reduce noise levels to the extent feasible.

**Action N-1.3** Require construction techniques for noise buffering, barriers or setbacks in development subject to high noise levels, such as the railroad and major roadways, to reduce noise to a level within the noise/land use compatibility standards, as shown in Figure N-1 [Table 17]. Sound walls are discouraged, unless there is no other feasible design available to minimize noise impacts along major roadways and the railroad.

**Goal N-2** Reduce noise levels from traffic and railroad operation.

**Policy N-2.1** The City should minimize potential transportation-related noise through street circulation design, coordination of routing and other traffic control measures, and consider use of “quiet” pavements when resurfacing roadways.

**Policy N-2.2** Truck traffic will be routed through and adjacent to Hughson in a manner that reduces truck-related noise impacts to sensitive land uses, as possible.

**Policy N-2.3** The City will seek to reduce impacts from ground borne vibrations associated with rail operations by requiring that habitable buildings are sited at least 100-feet from the centerline of the tracks, whenever feasible.

**Policy N-2.4** New residential development exposed to exterior railroad generated noise levels of 60 dB  $L_{dn}$  or greater should be designed to limit maximum single incident noise levels not to exceed 50 dB  $L_{max}$  in bedrooms and 55 dB  $L_{max}$  in other rooms.

**Action N-2.1** Encourage the BNSF Railroad to maintain existing track in good condition and minimize train horn soundings to the extent allowed by law.



**Action N-2.2** Require development of habitable buildings within 100-feet from the centerline of the railroad tracks to provide a study demonstrating that ground borne vibration issues associated with rail operations have been adequately addressed (i.e., through building siting or construction techniques).

**Action N-2.3** Coordinate with the County Sheriff's Department to enforce the California Vehicle Code as it relates to adequate vehicle mufflers, modified exhaust systems and vehicle stereo systems.

**Action N-2.4** Establish a noise abatement protocol for existing sensitive land uses located in areas anticipated to experience significant noise increases with the implementation of the General Plan, as well as identify potential funding for an abatement program. Cumulative traffic noise impacts on existing noise sensitive uses could be reduced through the inclusion of exterior and/or interior sound reduction measures such as noise barriers, forced-air mechanical ventilation, and sound rated window construction.

### *Regulatory Setting – Hughson Municipal Code and Noise Ordinance*

Chapter 9.30 of the Hughson Municipal Code establishes the following standards for noise:

#### **9.30.030 Prohibitions.**

It shall be unlawful for any person to make or continue, or cause, or permit to be made or continued, any unnecessary or unusual noise which unreasonably disturbs the peace and quiet of any zone classified R-A, R-1, R-2, R-3, C-1, C-2 or C-3 or which causes discomfort or annoyance to any reasonable person of normal sensitivities located in any such zone, and may be heard, without further amplification, 50 feet or more from the source of the noise. (Ord. 90-02 § 1, 1990).

#### **9.30.040 Standards.**

The standards which shall be considered in determining whether a violation of the provisions of this section exist shall include, but not be limited to the following:

- A. The volume of the noise;
- B. The intensity of the noise;
- C. Whether the nature of the noise is natural or unnatural;
- D. The volume and density of background noise, if any;
- E. The proximity of the noise to residential sleeping facilities;
- F. The nature and zoning of the area in which the noise emanates, and that in which it is heard;
- G. The intensity of the inhabitation of the area in which the noise emanates and that in which it is heard;
- H. The duration of the noise; and
- I. Whether the noise is produced by commercial or noncommercial activity. (Ord. 90-02 § 1, 1990)

#### **9.30.050 Hours of enforcement.**

The hours for enforcement shall be between the hours of 10:00 p.m. through 7:00 a.m., Monday through Friday and 10:00 p.m. through 8:00 a.m., Saturday and Sunday and legal holidays as that

term is defined in California Government Code Section 6700 as it now exists or shall be amended. (Ord. 90-02 § 1, 1990)

#### **9.30.060 Investigation.**

Upon receipt of a complaint from any person, the police department may investigate and assess whether the alleged noise levels exceed the noise standards in this chapter. (Ord. 90-02 § 1, 1990)

#### **9.30.070 Violation – Penalty.**

- A. Any person violating this chapter is guilty of an infraction.
- B. If, within a 24-hour period of the violation, there is a second violation by the same person, the violator shall be guilty of a misdemeanor for the separate offense.
- C. If, within the same 24-hour period, there are more than two violations by the same person, each such additional violation shall be deemed a separate and distinct violation and such violator shall be guilty of a misdemeanor for each such violation.
- D. Each day such violations are committed or permitted to continue shall constitute a separate offense and shall be punishable as such. (Ord. 90-02 § 1, 1990)

#### **9.30.080 Exemption.**

This chapter shall not be applicable to emergency work. (Ord. 90-02 § 1, 1990).

#### *Determination of a Significant Increase in Noise Levels*

The noise standards applicable to the project include the relevant portions of the Hughson General Plan and the City's Municipal Code described in the Regulatory Setting section above, and the following standards. Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. Table 18 is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the  $L_{dn}$ .

Based on the Table 18 data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB  $L_{dn}$ , or 3 dB or more where existing noise levels are between 60 to 65 dB  $L_{dn}$ . Extending this concept to higher noise levels,

an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB  $L_{dn}$ . The rationale for the Table 18 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

**Table 18: Significance of Changes in Noise Exposure**

<b>Ambient Noise Level Without Project, <math>L_{dn}</math></b>	<b>Increase Required for Significant Impact</b>
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

### Responses to Checklist Questions

#### Response a):

#### Construction Noise

During the construction of the project, including roads, water, sewer lines, and related infrastructure, noise from construction activities would add to the noise environment in the project vicinity. Existing receptors adjacent to the proposed construction activities are located north, south, and east of the site.

The FHWA Roadway Construction Noise Model (RCNM) was used to predict noise levels for standard construction equipment used for roadway improvement projects. The assessment of potential significant noise effects due to construction is based on the standards and procedures described in the Federal Transit Authority (FTA) guidance manual and FHWA's RCNM.

The RCNM is a Windows-based noise prediction model that enables the prediction of construction noise levels for a variety of construction equipment based on a compilation of empirical data and the application of acoustical propagation formulas. The model enables the calculation of construction noise levels in more detail than the manual methods, which eliminates the need to collect extensive amounts of project-specific input data. RCNM allows for the modeling of multiple pieces of construction equipment working either independently or simultaneously, the character of noise emission, and the usage factors for each piece of equipment.

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week), and the duration of the construction work.

Noise sources in the RCNM database include actual noise levels and equipment usage percentages. This source data was used in this construction noise analysis.

Table 19 shows predicted construction noise levels for each of the project construction phases. As shown in the table, site preparation, grading, and building construction are predicted to be the loudest phases of construction with an average noise exposure of 88 dBA  $L_{EQ}$  at 50 feet. Additionally, noise levels at the nearest sensitive receptors were calculated assuming the construction activity were uniformly distributed across the project site. The results of this analysis are shown graphically on Figure 15. As shown in Figure 15, noise levels at the nearest receptors would range from 58 dBA to 69 dBA  $L_{EQ}$ . Although there could be a relatively high short-term noise exposure potential causing an intermittent noise nuisance, the effect of construction

activities on longer-term ambient noise levels would be small but could result in a temporary increase in ambient noise levels in the project vicinity that could result in annoyance or sleep disturbance of nearby sensitive receptors.

**Table 19: Construction Equipment Noise Levels for Primary Construction Phases**

<i>Type of Equipment</i>	<i>Quantity</i>	<i>Usage (%)</i>	<i>Maximum, L<sub>MAX</sub> (dBA at 50 feet)</i>	<i>Hourly Average, L<sub>EQ</sub> (dBA at 50 feet)</i>
<b>Site Preparation</b>				
Dozer	3	40	82	83
Tractor/Loader/Backhoe	4	40	84	86
<i>Total</i>				<i>88</i>
<b>Grading</b>				
Excavator	2	40	81	80
Grader	1	40	85	81
Dozer	1	40	82	78
Scraper	2	40	84	83
Tractor/Loader/Backhoe	2	40	84	83
<i>Total</i>				<i>88</i>
<b>Building Construction</b>				
Crane	1	16	81	73
Forklift	3	40	83	84
Generator	1	50	81	78
Tractor/Loader/Backhoe	3	40	84	85
Welder/Torch	1	40	74	70
<i>Total</i>				<i>88</i>
<b>Paving</b>				
Paver	2	50	77	77
Paving Equipment	2	50	77	77
Rollers	2	20	80	76
<i>Total</i>				<i>81</i>
<b>Architectural Coating</b>				
Air Compressor	1	40	79	75
<i>Total</i>				<i>75</i>

SOURCE: FHWA, ROADWAY CONSTRUCTION NOISE MODEL (RCNM), JANUARY 2006.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration and would likely occur primarily during daytime hours.

Construction activities would be temporary in nature and are outside the hours of enforcement from noise regulation by City staff during the hours of 8:00 AM to 10:00 PM on weekdays, as outlined in the City's Municipal Code for house of enforcement of the City's noise ordinance. Compliance with the City's permissible hours of construction to avoid late evenings, nights, and Sundays, as well as implementing the best management noise reduction techniques and practices (both outlined in Mitigation Measure NOI-1), would ensure that construction noise would not result in a substantial temporary increase in ambient noise levels that would result in annoyance

or sleep disturbance of nearby sensitive receptors. Because construction activities would only occur between 7 AM to 7 PM on weekdays and 8 AM to 4 PM on Saturdays with no work allowed on Sundays unless otherwise authorized by the City in writing, the associated construction noise at the nearby receptors would not occur during the most sensitive times. Implementation of the Mitigation Measure NOI-1 will ensure that these potential impacts are reduced to a ***less-than-significant*** level.

### Traffic and Operational Noise at Existing Receptors

Implementation of the proposed project would result in an increase in average daily trip volumes on the local roadway network, and consequently, an increase in noise levels from traffic sources along affected segments. Tables 20 and 21 show the predicted traffic noise level increases on the local roadway network for Existing, Existing + Project, Cumulative No Project, and Cumulative + Project conditions. Appendix B of Appendix B provides the complete inputs and results of the FHWA traffic noise modeling. It should be noted that the distances shown in Tables 20 and 21 are measured from the roadway centerline to the center of the outdoor area of the closest typical residential setback.

**Table 20: Baseline and Baseline Plus Project Traffic Noise Levels**

Roadway	Segment	Approx. Receptor Distance <sup>1</sup>	Noise Levels ( $L_{dn}$ , dB) at Nearest Sensitive Receptors				
			Baseline	Baseline + Project	Change	Criteria <sup>2</sup>	Significant?
Hatch Rd.	Santa Fe Ave. to Tully Rd.	75	67.2	67.2	0.0	+5 dB or > 60 dB	No
Tully Rd.	Hatch Rd. to Narcisco Way	45	57.8	58.0	0.1	+5 dB or > 60 dB	No
Santa Fe Ave.	Hatch Rd. to project access	100	63.2	64.1	0.8	+3.0 dB	No
Santa Fe Ave.	Project access to Los Alamos Dr.	50	62.8	62.9	0.2	+3.0 dB	No
Walnut Haven Dr.	Heartnut Way to Tully Rd.	45	51.0	51.3	0.3	+5 dB or > 60 dB	No
Graybark Ln.	Heartnut Way to Tully Rd.	45	52.5	54.0	1.5	+5 dB or > 60 dB	No
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	40	50.0	52.9	3.0	+5 dB or > 60 dB	No
Flora Vista Dr.	Project site to Los Alamos Dr.	40	52.1	54.5	2.4	+5 dB or > 60 dB	No
Estancia Dr.	Leaflet Lane to Flora Vista Dr.	40	45.1	45.5	0.4	+5 dB or > 60 dB	No
Flora Vista Dr.	Estancia Drive to Ester Marie Dr.	40	54.1	55.4	1.3	+5 dB or > 60 dB	No
Fox Rd.	Ester Marie Avenue to Tully Rd.	40	54.9	56.0	1.1	+5 dB or > 60 dB	No

**NOTES:**

<sup>1</sup> THE APPROXIMATE RECEPTOR DISTANCES SHOWN (IN FEET) WERE MEASURED FROM THE CENTERLINE OF THE ROADWAY SEGMENT TO THE CENTER OF THE NEAREST OUTDOOR ACTIVITY AREA.

<sup>2</sup> WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 dB AN INCREASE OF 5 dB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 dB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 dB BUT ARE LESS THAN 65 dB, AN INCREASE OF 3 dB OR MORE WOULD BE SIGNIFICANT. WHERE

EXISTING NOISE LEVELS EXCEED 65 dB, AN INCREASE OF 1.5 dB OR MORE WOULD BE SIGNIFICANT.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2020.

**Table 21: Cumulative and Cumulative + Project Traffic Noise Levels**

Roadway	Segment	Approx. Receptor Distance <sup>1</sup>	Noise Levels ( $L_{dn}$ , dB) at Nearest Sensitive Receptors				
			Cum.	Cum. + Project	Change	Criteria <sup>2</sup>	Significant?
Hatch Rd.	Santa Fe Ave. to Tully Rd.	75	67.9	67.9	0.0	+5 dB or > 60 dB	No
Tully Rd.	Hatch Rd. to Narcisco Way	45	60.3	60.4	0.1	+3.0 dB	No
Santa Fe Ave.	Hatch Rd. to project access	100	65.9	66.4	0.5	+1.5 dB	No
Santa Fe Ave.	Project access to Los Alamos Dr.	50	65.5	65.6	0.1	+3.0 dB	No
Walnut Haven Dr.	Heartnut Way to Tully Rd.	45	51.2	51.5	0.3	+5 dB or > 60 dB	No
Graybark Ln.	Heartnut Way to Tully Rd.	45	53.3	54.6	1.3	+5 dB or > 60 dB	No
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	40	51.8	54.0	2.1	+5 dB or > 60 dB	No
Flora Vista Dr.	Project site to Los Alamos Dr.	40	53.4	55.3	1.9	+5 dB or > 60 dB	No
Estancia Dr.	Leaflet Lane to Flora Vista Dr.	40	45.5	45.9	0.4	+5 dB or > 60 dB	No
Flora Vista Dr.	Estancia Drive to Ester Marie Dr.	40	54.9	56.0	1.1	+5 dB or > 60 dB	No
Fox Rd.	Ester Marie Avenue to Tully Rd.	40	55.5	56.5	1.0	+5 dB or > 60 dB	No

**NOTES:**

<sup>1</sup> THE APPROXIMATE RECEPTOR DISTANCES SHOWN (IN FEET) WERE MEASURED FROM THE CENTERLINE OF THE ROADWAY SEGMENT TO THE CENTER OF THE NEAREST OUTDOOR ACTIVITY AREA.

<sup>2</sup> WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 dB AN INCREASE OF 5 dB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 dB  $L_{dn}$  NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 dB BUT ARE LESS THAN 65 dB, AN INCREASE OF 3 dB OR MORE WOULD BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 dB, AN INCREASE OF 1.5 dB OR MORE WOULD BE SIGNIFICANT.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2020.

As shown in Tables 20 and 21, some noise-sensitive receptors located along the project-area roadways are currently exposed to exterior traffic noise levels exceeding the City of Hughson 60 dB  $L_{dn}$  exterior noise level standard for residential uses. These receptors would continue to experience elevated exterior noise levels with implementation of the proposed project. For example, sensitive receptors under Existing conditions located adjacent to Santa Fe Avenue near the project access and Los Alamos Drive experience an exterior noise level of approximately 62.8 dB  $L_{dn}$ . Under Existing + Project conditions, exterior traffic noise levels are predicted to be approximately 62.9 dB  $L_{dn}$ . Exterior noise levels in both scenarios exceed the City's exterior noise level standard of 60 dB  $L_{dn}$ . However, the project's contribution of 0.2 dB would not exceed the FICON criteria of 3 dB where existing noise levels are between 60 and 65 dB.



The proposed project would include typical residential noise which would be compatible with the adjacent existing single-family residential uses. The proposed project would include typical residential noise sources which would be compatible with the adjacent existing residential uses (i.e., neighborhood traffic, yard equipment, truck deliveries, garbage collected, etc.). Proposed neighborhood parks are located internal to the project site and would not impact off-site residential uses. This is a ***less-than-significant*** impact and no mitigation is required.

### **Railroad, Traffic and Operational Noise at Proposed Receptors**

The predicted exterior and interior noise levels at the proposed residential receptors are discussed in detail below.

#### Noise at Proposed Receptors - Exterior

The analysis of exterior noise impacts at proposed receptors is outside of the purview of CEQA based on recent case law and the updated Appendix G checklist in the 2019 CEQA Guidelines. As a result, this analysis is not necessary for CEQA compliance. Nonetheless, in order to ensure that new residents are exposed to acceptable noise levels, analysis of exterior noise impacts at proposed receptors was completed for the project. Therefore, this analysis is not required for CEQA compliance but is presented for full disclosure and for the City to determine the project's compliance with the General Plan policies on noise exposure.

Table 22 shows the predicted traffic and railroad noise levels at the proposed residential uses adjacent to the major project-area arterial roadways. Based upon Table 22, exterior noise levels would exceed the City's 60 dBA  $L_{DN}$  normally acceptable exterior noise standard. The 60 dBA  $L_{DN}$  noise contour for the BNSF railroad was found to extend to an approximate distance of 1,186 feet from the railroad centerline. This noise contour would extend into the majority of the project site. Therefore, use of a physical barrier would be the only feasible method to reduce exterior noise levels to within the City's allowable exterior noise standard range. Table 22 also indicates the property line noise barrier heights required to achieve compliance with an exterior noise level standard of 60 dB  $L_{dn}$ .

**Table 22: Predicted Cumulative Traffic Noise Levels**

<b>Segment</b>	<b>Approximate Residential Setback, feet<sup>1</sup></b>	<b>Predicted Noise Levels, dB <math>L_{DN}</math><sup>2</sup></b>					
		<b>No Barrier</b>	<b>8' Barrier</b>	<b>9' Barrier</b>	<b>10' Barrier</b>	<b>11' Barrier</b>	<b>12' Barrier</b>
Santa Fe Ave.	50	75	65	63	62	61	60
E Hatch Rd.	170	57	N/A	N/A	N/A	N/A	N/A

**NOTES:**

<sup>1</sup> SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.

<sup>2</sup> THE MODELED NOISE BARRIERS ASSUME FLAT SITE CONDITIONS WHERE ROADWAY ELEVATIONS, BASE OF WALL ELEVATIONS, AND BUILDING PAD ELEVATIONS ARE APPROXIMATELY EQUIVALENT. SOUND BARRIER HEIGHT MAY BE ACHIEVED THROUGH THE USE OF A WALL AND EARTHEN BERM TO ACHIEVE THE TOTAL HEIGHT (I.E. 8-FOOT WALL ON 2-FOOT BERM IS EQUIVALENT TO AN 10-FOOT TALL BARRIER).

SOURCE: SAXELBY ACOUSTICS. 2020.

The complete inputs and results of the barrier calculations are contained in the Environmental Noise Assessment, Appendix C (see Appendix B of this IS/MND). The modeled noise barriers

assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

The proposed residential uses are located approximately 150 feet from the centerline of the BNSF railroad centerline. Measured noise levels at 190 feet from the railroad were found to be 72 dB  $L_{dn}$ . At a distance of 150 feet, railroad noise levels are predicted to be 73.0 dB  $L_{dn}$ . The combined traffic and railroad noise level is estimated to be 74.6 dB  $L_{dn}$  at the nearest proposed residential uses along Santa Fe Avenue.

The Table 22 data indicate that a noise barrier 12-feet in height would be required to achieve compliance with the City of Hughson 60 dB  $L_{dn}$  exterior noise level standard for the proposed residential uses. It should be noted that Figure N-1 [Table 17] of the City's General Plan notes that residential uses are conditionally compatible with exterior noise levels of up to 70 dB  $L_{dn}$ , assuming that interior noise levels are in compliance with the City's interior noise level standards. The City of Hughson has indicated that they would only support construction of a sound wall at the project site which matches the height of the adjacent residential development to the south along Santa Fe Avenue. Therefore, it is expected that the proposed project would also include construction of a 10-foot tall sound wall. Based on Table 22, a 10 foot tall barrier would achieve an exterior noise level of 62 dB  $L_{dn}$  which would fall within the City's conditionally acceptable exterior noise level standard of up to 70 dB  $L_{dn}$ .

Condition of Approval NOI-1 requires construction of a noise barrier along Santa Fe Avenue in order to reduce exterior noise levels. See Figure 16 for the recommended sound wall location. With implementation of this Condition of Approval, impacts associated with exterior noise levels would be *less than significant*.

#### Noise at Proposed Receptors - Interior

The analysis of interior noise impacts at proposed receptors is outside of the purview of CEQA based on recent case law and the updated Appendix G checklist in the 2019 CEQA Guidelines. As a result, this analysis is not necessary for CEQA compliance. Nonetheless, in order to ensure that new residents are exposed to acceptable noise levels, analysis of exterior noise impacts at proposed receptors was completed for the project. Therefore, this analysis is not required for CEQA compliance but is presented for full disclosure and for the City to determine the project's compliance with the General Plan policies on noise exposure.

Modern construction typically provides a 25-dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB  $L_{dn}$ , or less, will typically comply with the City of Hughson 45 dB  $L_{dn}$  interior noise level standard. Additional noise reduction measures, such as acoustically-rated windows, are generally required for exterior noise levels exceeding 70 dB  $L_{dn}$ .

It should be noted that noise barriers do not typically reduce exterior noise levels at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first floor exterior transportation noise levels of up to 75 dB  $L_{dn}$ . Mitigated first-floor noise levels of 61 dBA  $L_{dn}$  are expected after construction of sound barriers.

Based upon a 20-dB exterior-to-interior noise level reduction, interior noise levels are predicted to be up to 55 dB  $L_{dn}$ . Accordingly, predicted interior noise levels along the first row of residential uses along Santa Fe Avenue are predicted to exceed the City's 45 dB  $L_{dn}$  interior noise level standard at second floor locations.

In addition to the City's 45 dB  $L_{dn}$  interior noise level standard, Policy N-2.4 of the City's General Plan Noise Element requires that residential uses exposed to exterior noise levels of 60 dB  $L_{dn}$ , or greater, "should be designed to limit maximum single incident noise levels not to exceed 50 dB  $L_{max}$  in bed-rooms and 55 dB  $L_{max}$  in other rooms." Based upon the railroad noise measurements conducted for the project, average  $L_{max}$  noise levels for train operations was found to be 19 dB higher than the  $L_{dn}$  value. Therefore, the average maximum single incident noise level for railroad operations is predicted to be 94 dB  $L_{max}$ . In order to meet the City's maximum noise level standard of 50 dB in bedrooms and 55 dB in other rooms, additional interior noise control measures will be required.

Appendix D of Appendix B shows an estimate of the interior noise control measures required to meet the City's interior noise level standards. This analysis assumes that mechanical ventilation will be provided to allow residents to keep doors and windows closed, as desired, for acoustical isolation.

Condition of Approval NOI-2 would minimize noise impacts resulting from transportation noise impacts on the proposed project site by requiring minimum one-coat stucco with 5/8-inch interior gypsum hung on a resilient channel and glazing having a minimum sound transmission class (STC) rating of 45 at bedrooms and STC 40 for other rooms located within the first two rows of lots adjacent to the Santa Fe Avenue. First floor facades of the same two rows of lots adjacent to the Santa Fe Avenue will also be required to have minimum one-coat stucco with STC 33 glazing. With implementation of this Condition of Approval, impacts associated with interior noise levels would be ***less than significant***.

#### *Mitigation Measure(s)*

***Mitigation Measure NOI-1:*** *To reduce potential construction noise impacts during project construction, the following multi-part mitigation measure shall be implemented for the project:*

- *All construction equipment powered by internal combustion engines shall be properly muffled and maintained.*
- *Quiet construction equipment, particularly air compressors, shall be selected whenever possible.*
- *All stationery noise-generating construction equipment such as tree grinders and air compressors shall be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.*
- *Unnecessary idling of internal combustion engines is prohibited.*
- *The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.*
- *Construction shall be limited to 7 AM to 7 PM on weekdays and 8 AM to 4 PM on Saturdays with no work allowed on Sundays unless otherwise authorized by the City in writing.*

*This requirement shall be noted in the improvement plans prior to approval by the City's Public Works Department.*

***Condition of Approval NOI-1:*** *A 10-foot tall masonry sound wall shall be constructed along the Santa Fe Avenue frontage, adjacent to the proposed residential uses, in order to achieve the City's exterior noise standards. The noise barrier could be constructed with an eight-foot tall sound wall with a two-foot tall earthen berm combination, or a nine-foot tall sound wall with a one-foot tall earthen berm combination, if preferred. Noise barrier walls shall be constructed of concrete panels,*

concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. Figure 16 of the IS/MND shows the recommended sound wall location.

**Condition of Approval NOI-2:** For the first two rows of lots adjacent to the Santa Fe Avenue right of way, second floor exterior facades facing parallel or perpendicular to Santa Fe Avenue shall be constructed of minimum one-coat stucco with 5/8" interior gypsum hung on a resilient channel and glazing having a minimum sound transmission class (STC) rating of 45 at bedrooms and STC 40 for other rooms. First floor facades of the same two rows of lots adjacent to the Santa Fe Avenue shall be required to have minimum one-coat stucco with STC 33 glazing. Facades facing away from Santa Fe Avenue would likely not require these measures. Due to the high level of exterior noise exposure, and the variability of materials having similar STC ratings, the applicant shall provide a detailed analysis of interior noise control measures once building plans become available. The analysis shall be prepared by a qualified noise control engineer and shall outline the specific measures required to meet the City's 45 dBA  $L_{dn}$  interior noise level standard, as well as the City's maximum ( $L_{max}$ ) noise standard of 50 dB in bedroom and 55 dB in other rooms. The interior noise control analysis shall be reviewed by City staff and the recommendations shall be incorporated into the project building plans.

Mechanical ventilation shall be provided for all units to allow occupants to keep doors and windows closed for acoustic isolation. Figure 16 shows the recommended interior noise control measures.

These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. The detailed analysis shall be submitted to the City's Public Works Department for review and approval.

**Response b):** Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by several factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 23 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). One-half this minimum threshold or 0.1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec p.p.v.

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and roadway construction occur. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 25 to 50 feet or

further from the project site. At this distance, construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 24 shows the typical vibration levels produced by construction equipment.

**Table 23: Effects of Vibration on People and Buildings**

<b>Peak Particle Velocity</b>		<b>Human Reaction</b>	<b>Effect on Buildings</b>
<b>mm/sec.</b>	<b>in./sec.</b>		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBOEN VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

**Table 24: Vibration Levels for Varying Construction Equipment**

<b>Type of Equipment</b>	<b>Peak Particle Velocity @ 25 feet (inches/second)</b>	<b>Peak Particle Velocity @ 50 feet (inches/second)</b>
Large Bulldozer	0.089	0.031
Caisson Drilling	0.089	0.031
Hoe Ram	0.089	0.031
Loaded Trucks	0.076	0.027
Small Bulldozer	0.003	0.001
Auger/drill Rigs	0.089	0.031
Jackhammer	0.035	0.012
Vibratory Compactor/roller	0.210	0.074

SOURCE: FEDERAL TRANSIT ADMINISTRATION, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT GUIDELINES, SEPTEMBER 2018.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural damage.

With the exception of vibratory compactors, the Table 24 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at a distance of 25 feet. Use of vibratory compactors within 26 feet of the adjacent buildings could cause vibrations in excess of 0.2 in/sec. Sensitive receptors which could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located approximately 10 to 15 feet, or further, from the project site.

Implementation of the following mitigation measure will ensure that these potential impacts are reduced to a ***less-than-significant*** level.

*Mitigation Measure(s)*

***Mitigation Measure NOI-2:*** Any compaction required less than 26 feet from the adjacent residential structures shall be accomplished by using static drum rollers, which use weight instead of vibrations to achieve soil compaction. As an alternative to this requirement, pre-construction crack documentation and construction vibration monitoring shall be conducted to ensure that construction vibrations do not cause damage to any adjacent structures. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department.

**Response c):** The project site is not located within the vicinity of 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. The closest airport or airstrip is the Oakdale Airport, located approximately 10.7 miles north of the project site. The proposed project would, therefore, not expose people residing or working in the project area to excessive noise levels associated with such airport facilities. The project site is not located within the vicinity of a private airstrip. The proposed project would, therefore, not expose people residing or working in the project area to excessive noise levels associated with such private airport facilities. Implementation of the proposed project would have ***no impact*** relative to this topic.

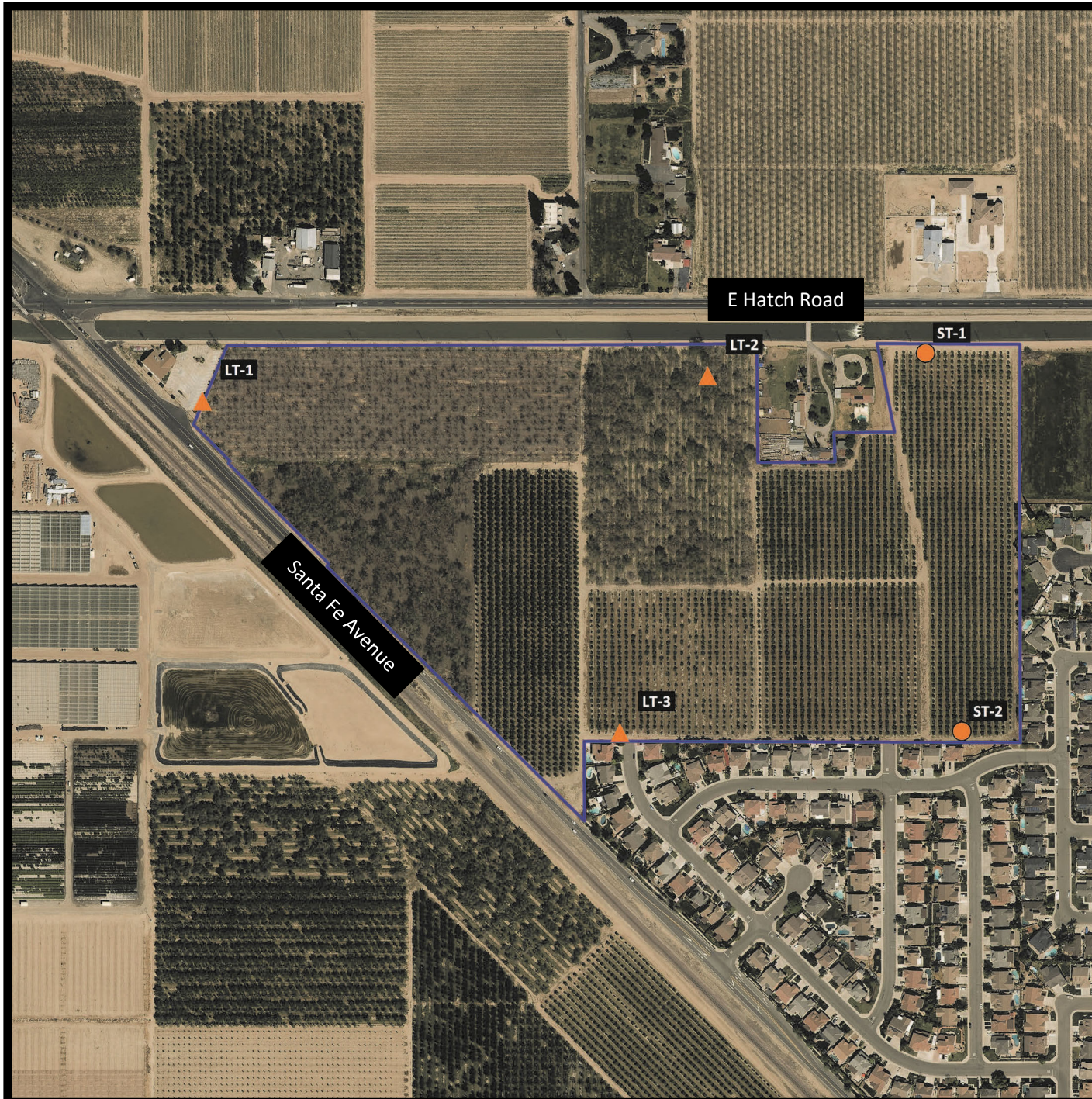


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CITY OF HUGHSON PARKWOOD  
SUBDIVISION

Figure 14. Noise Measurement Sites



Legend

-  Project Site
-  Noise Measurement - Long Term
-  Noise Measurement - Short Term



125 m      375 m      625 m

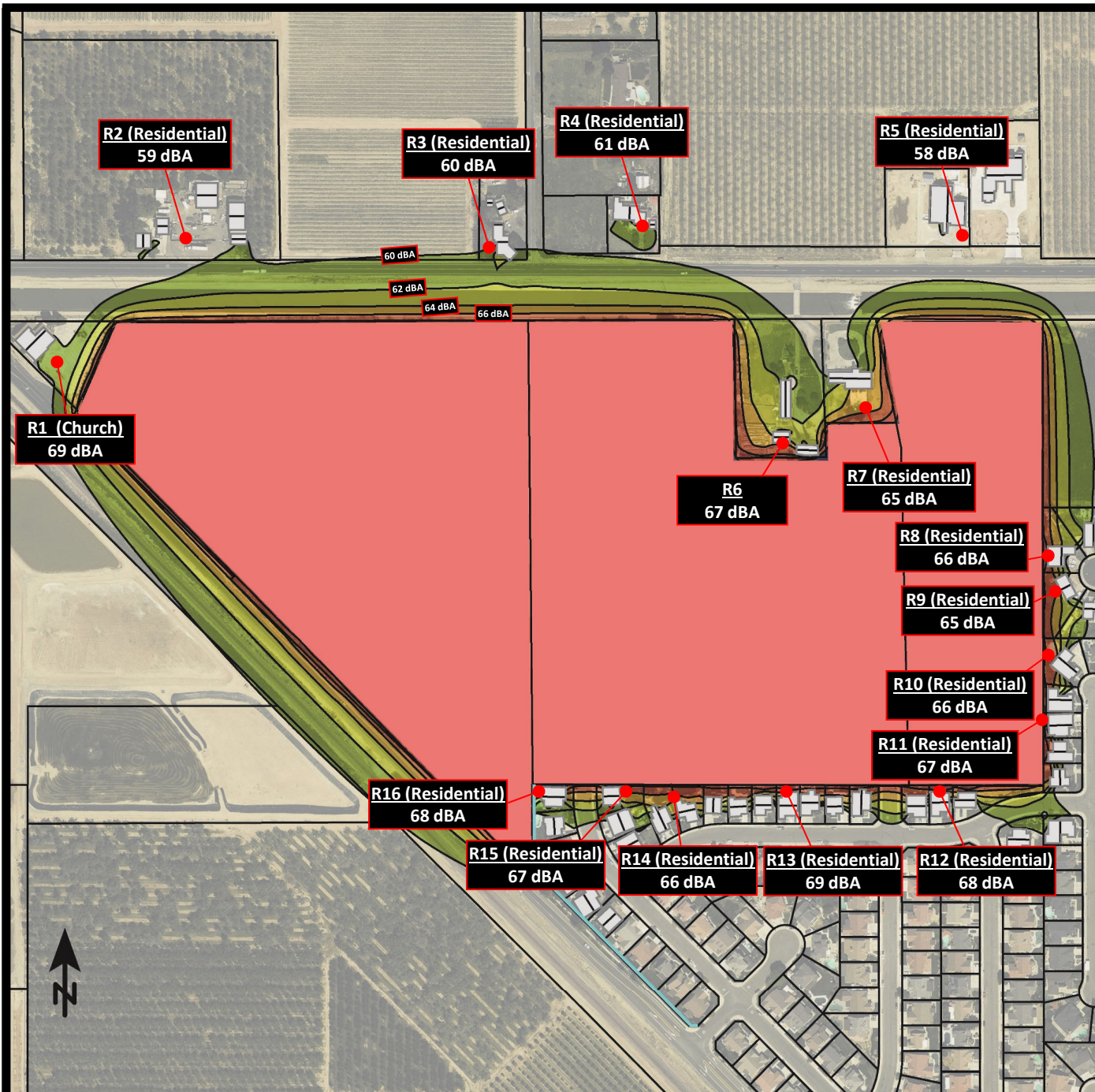
Projection: State Plane (California Zone 3) / NAD83 / meters  
Rev. Date: 04/01/2019



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# CITY OF HUGHSON PARKWOOD SUBDIVISION

Figure 15. Predicted Loudest-Hour  
Construction Noise Levels (dBA,  $L_{eq}$ )



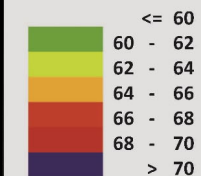
## Signs and symbols

- Parcel Line
- Existing Sound Wall
- Construction Noise Source

## Level tables

Level tables

## Levels in dB(A)



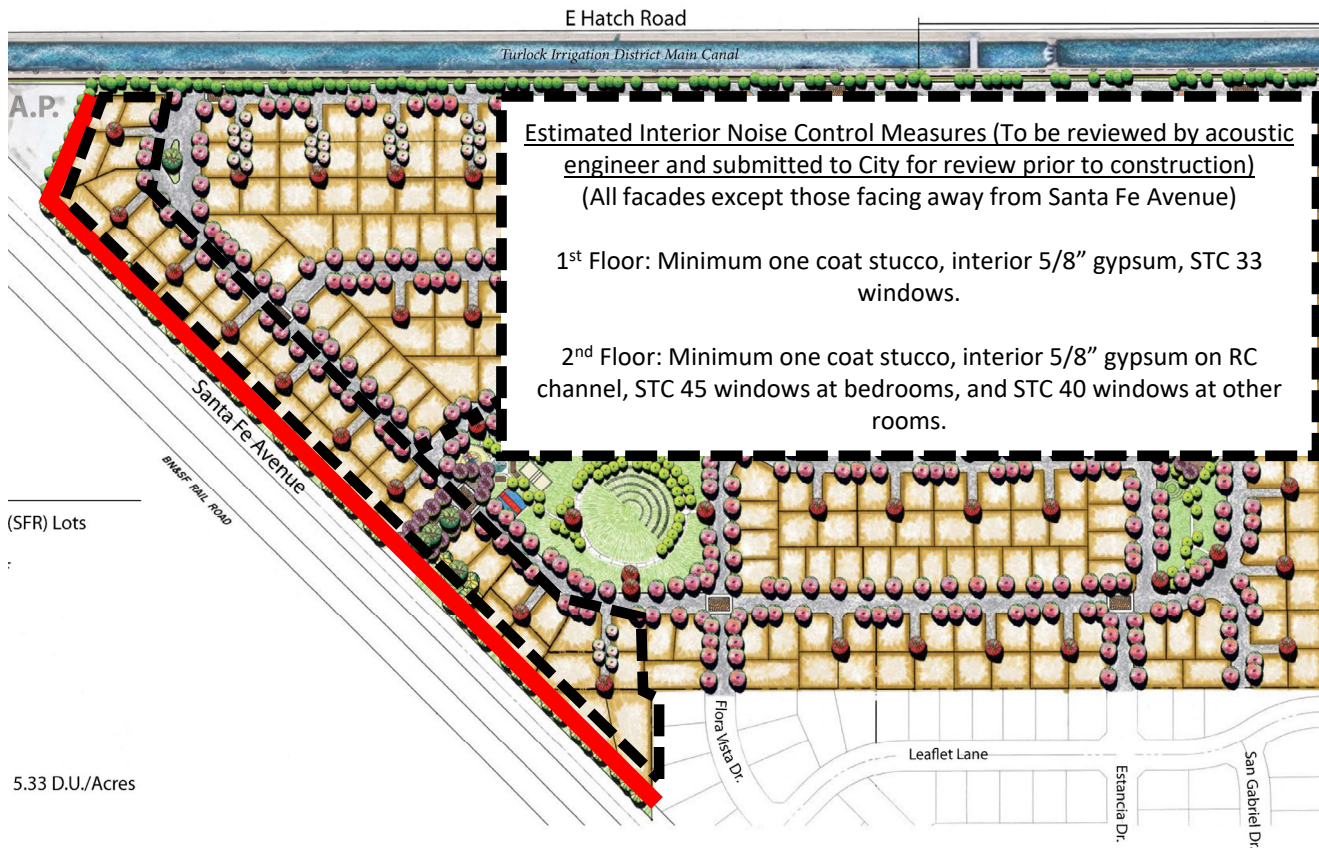
1 : 4601




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CITY OF HUGHSON PARKWOOD  
SUBDIVISION

Figure 16. Noise Control Measures



 : Sound Wall Location



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*XIV. POPULATION AND HOUSING*

<i>Would the project:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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)?			X	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

*Responses to Checklist Questions*

**Response a):** According to the 2019 Department of Finance population estimates, the population in Hughson is 8,017 people. According to the most recent Department of Finance (2019) estimates, the average number of persons residing in a dwelling unit in the City of Hughson is 3.46. The proposed project would result in the construction of residential housing that would generate an estimated 1,034 people. This is an estimated 12.9 percent growth in Hughson. An estimated 12.9 percent growth in Hughson is not considered substantial growth in Hughson or the region as it is consistent with the assumed growth in the General Plan. The 1,034 people may come from Hughson or surrounding communities. The proposed project would not include upsizing of offsite infrastructure or roadways. The installation of new infrastructure would be limited to the internal single-family subdivision. The sizing of the infrastructure would be specific to the number of units proposed within the project site. Implementation of the proposed project would not induce substantial population growth in an area, either directly or indirectly. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** The project site is currently undeveloped and does not contain housing. The proposed project would not displace housing or people. Implementation of the proposed project would have ***no impact*** relative to this topic.

***XV. PUBLIC SERVICES***

	<b><i>Potentially Significant Impact</i></b>	<b><i>Less Than Significant with Mitigation Incorporation</i></b>	<b><i>Less Than Significant Impact</i></b>	<b><i>No Impact</i></b>
a) 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 other performance objectives for any of the public services:				
Fire protection?			X	
Police protection?			X	
Schools?			X	
Parks?			X	
Other public facilities?				X

***Responses to Checklist Questions*****Response a):****Fire Protection**

The project site is currently under the jurisdiction of the Hughson Fire Protection District. The Hughson Fire Protection District provides fire suppression, emergency medical services, technical rescue, hazardous materials response, fire prevention, public education, and disaster preparedness to approximately 35 square miles of Stanislaus County, including the City of Hughson. The Hughson Fire Protection District includes two paid staff and 29 volunteers. The Hughson Fire Department operates out of one station in downtown Hughson. The nearest fire station to the project site is located at 2315 Charles Street, Hughson, approximately 1.0 miles southeast of the project site.

While the Hughson Fire Protection District provides primary fire protection to the community, it also has a mutual aid agreement with most of the other fire protection service providers in Stanislaus County. As a result, if the Hughson Fire Protection District is not available to answer a call in the city, another fire department or district will respond to the call.

The Stanislaus Consolidated Fire Protection District cooperates with the City to reduce the risk of fires in the area. Prior to project approval, the Stanislaus Fire Protection District reviews plans for new development to assess design issues, such as the provision of adequate water supply systems, compliance with minimum street widths, and hydrant locations and distances. The Stanislaus Fire Protection District is also responsible for fire prevention programs and fire investigations for most of the County, including the City of Hughson. Hughson Fire Protection District assists with these tasks.

The proposed project would add 299 residential units, which is anticipated to add 1,034 people to the City of Hughson. The additional of 1,034 people in the City of Hughson would place additional demands for fire service on the Hughson Fire Protection District.

The City of Hughson General Plan includes policies and actions that would allow for the District to continue providing adequate facilities and staffing levels. For example, Policies PSF-2.1 and

PSF-2.2, and Action PSF-2.1, address continued cooperation between the City and the Hughson Fire Protection District to provide adequate fire protection service to the community and explore methods to improve the level of service provided. The City would also continue to support the existing mutual aid agreements (Policy PSF-2.3). To reduce the overall need for fire protection, the City would enforce all relevant fire codes and ordinances (Policy PSF-2.4), require all new development to use fire-safe building materials and early warning systems, install sufficient water supply systems (Policy PSF-2.5), and encourage the installation of sprinkler systems (Policy PSF-2.6). The City would also forward new development applications to the Hughson Fire Protection District and Stanislaus County Fire Protection District for their review (Action PSF-2.2).

The City's General Plan EIR concludes that no significant impacts related to fire services would result from buildout of the General Plan land uses. The project would not increase demand for fire services beyond the levels assumed for the site in the City's General Plan EIR. As such, the project would not result in physical impacts associated with the provision of new or physically altered fire facilities, or the need for new or physically altered fire facilities, in order to maintain acceptable service ratios, response times or other performance objectives for the Hughson Fire Protection District. Ongoing revenues that would come from property taxes generated by the proposed project would fund capital and labor costs associated with fire protection services. Therefore, the impact of the proposed project on the need for additional fire services facilities is ***less than significant***.

### **Police Protection**

The project site is currently under the jurisdiction of the Stanislaus County Sheriff. As of September 1, 2001, the City of Hughson has contracted with the Stanislaus County Sheriff to provide the City with Police Services. This replaces the former Hughson Police Department, yet still provides the City with the same services and protections. The Stanislaus County Sheriff operates a base station located at 7018 Pine Street. The project site is located approximately 0.82 miles northwest of the station.

The City coordinates with the Stanislaus County Sheriff's Department to develop and provide crime prevention programs, and to distribute information to the public regarding personal safety precautions and protection of private property. According to the General Plan EIR, the Department reviews new development proposals for crime prevention design and general safety, and keeps abreast of population increases, which might trigger a need for additional staff or facilities.

The proposed project would add 299 residential units, which is anticipated to add 1,034 people to the City of Hughson. The additional of 1,034 people in the City of Hughson would place additional demands for police service on the Hughson Police Department.

The City of Hughson General Plan includes policies and actions to ensure an adequate level of police service over time in order to maintain a low occurrence of criminal activity in the community (Policy PSF-1.1). As part of ensuring adequate policing levels, the City would review the contracted staffing levels when renegotiating the Sheriff's Department's contract (Action PSF-1.1). To reduce the overall need for policing, the 2005 General Plan also includes Actions PSF-1.2 and 1.3, which require the review of major development projects to ensure they are designed to minimize criminal activity, as well as the maintenance of City crime prevention and community awareness programs.

The City's General Plan EIR concludes that no significant impacts related to police services would result from buildout of the General Plan land uses. The project would not increase demand for police services beyond the levels assumed for the site in the City's General Plan EIR. As such, the project would not result in physical impacts associated with the provision of new or physically altered police facilities, or the need for new or physically altered police facilities, in order to maintain acceptable service ratios, response times or other performance objectives for the Stanislaus County Sheriff's Department. Ongoing revenues that would come from property taxes generated by the proposed project would fund capital and labor costs associated with police protection services. Therefore, the impact of the proposed project on the need for additional police services facilities is *less than significant*.

## Schools

The Hughson Unified School District (HUSD) provides kindergarten through 12<sup>th</sup> grade education for students living in Hughson and the surrounding unincorporated areas. All of the HUSD's six schools are located within Hughson, including:

- Hughson Elementary School (pre-kindergarten through 3rd grade) – 583 students during 2015/2016
- Fox Road Elementary School (4th and 5th grades) – 304 students during 2015/2016
- Emilie J. Ross Middle School (6th through 8th grades) – 482 students during 2015/2016
- Hughson High School (9th through 12th grades) – 712 students during 2015/2016
- Billy Joe Dickens Continuation (alternative education) – 29 students during 2015/2016
- Valley Community Day School (8th through 12th grades) – 9 students during 2015/2016

As shown above, the schools in the City had a total enrollment of approximately 2,119 students during the 2015/2016 school year.

According to the City's General Plan EIR, one residential unit would generate an average of 0.7 students. This total is further broken down into 0.4 kindergarten through 5<sup>th</sup> grade students, 0.1 6<sup>th</sup> through 8<sup>th</sup> grade students, and 0.2 high school students per dwelling unit. Using these rates. The proposed 299 units would result in 119 kindergarten through 5<sup>th</sup> grade students, 29 6<sup>th</sup> through 8<sup>th</sup> grade students, and 59 high school students.

The City's General Plan includes policies and actions to work with HUSD to provide for adequate and well-designed public school facilities to meet future demand. As a result of General Plan Policies PSF-3.1 and PSF-3.2, the City would work with HUSD to ensure, to the extent allowed by law, that adequate school facilities are provided concurrently with new development. Hughson would also provide the District with the opportunity to review residential development proposals to assist the City in assessing the potential impacts on schools (Policy PSF-3.5). The location and design of future school sites is also addressed by Policy PSF-3.3 of the 2005 General Plan, which recommends that a school be centrally located to the student population it would serve. To maximize benefits, Policy PSF-3.4 encourages school sites to be integrated with parks to provide additional recreational opportunities for the community.

Public school facilities and services are partially supported through the assessment of development fees. The HUSD charges every new residential dwelling unit \$3.15 per square foot, and all new commercial development \$0.36 per square foot. HUSD is limited by State law as to how much it can collect from new development. Funding of school facilities has been impacted

by the passing of SB 50, which limits the impact fees and site dedication that school districts can require of developers, to off-set the impact of new development on the school system.

The provisions of State law are considered full and complete mitigation for the purposes of analysis under CEQA for school construction needed to serve new development. In fact, State law expressly precludes the City from reaching a conclusion under CEQA that payment of the Leroy F. Greene School Facilities Act school impact fees would not completely mitigate new development impacts on school facilities. Consequently, the City of Hughson is without the legal authority under CEQA to impose any fee, condition, or other exaction on the project for the funding of new school construction other than the fees allowed by the Leroy F. Greene School Facilities Act. Although MUSD may collect higher fees than those imposed by the Leroy F. Greene School Facilities Act, no such fees are required to mitigate the impact under CEQA. Because the project would pay fees as required by The Leroy F. Greene School Facilities Act, this impact would be ***less than significant***.

### **Parks**

The proposed project directly increases the number of persons in the area as a result of the proposed residential uses. The proposed project includes 299 residential units, which is projected to increase the population by an estimated 1,034 people (based on 3.46 persons per household). For the purposes of extractive and collecting fees to mitigate for increase park demands (Quimby Act), the California Government Code Section 66477 states: *The amount of land dedicated or fees paid shall be based upon the residential density, which shall be determined on the basis of the approved or conditionally approved tentative map or parcel map and the average number of persons per household. There shall be a rebuttable presumption that the average number of persons per household by units in a structure is the same as that disclosed by the most recent available federal census or a census taken pursuant to Chapter 17 (commencing with Section 40200) of Part 2 of Division 3 of Title 4.*

The City's General Plan identifies a park standard based on a goal of five acres of parkland per 1,000 residents within the city limits. Using this parkland goal, the proposed project would be required to provide 5.17 acres of parkland for the resulting 1,034 residents. The project includes development of 6.14 acres of park/dual use facilities. These park/dual use facilities are intended to serve the residents of the proposed project. Because the project would meet the City's General Plan park standard by, the proposed project is not subject to the City park dedication in-lieu fees. As such, the proposed project will result in a ***less-than-significant*** impact.

### **Other Public Facilities**

The proposed project would not result in a need for other public facilities that are not addressed above, or in Section XVIII, Utilities and Service Systems. Implementation of the proposed project would have ***no impact*** relative to this issue.



*XVI. RECREATION*

	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

*Responses to Checklist Questions*

**Responses a):** The project would result in the construction of 299 single-family residential homes. The proposed project would result in an estimated 1,034 individuals. The City's General Plan identifies a park standard based on a goal of five acres of parkland per 1,000 residents within the city limits. Using this parkland goal, the proposed project would be required to provide 5.17 acres of parkland for the resulting 1,034 residents. The project includes development of 6.14 acres of park/dual use facilities. These park/dual use facilities are intended to serve the residents of the proposed project. Because the project would meet the City's General Plan park standard, the proposed project is not subject to the City park dedication in-lieu fees. Therefore, this impact would be ***less than significant***.

**Responses b):** The proposed project does not include the construction of public recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Implementation of the proposed project would have ***no impact*** relative to this topic.

***XVII. TRANSPORTATION***

<b><i>Would the project:</i></b>	<b><i>Potentially Significant Impact</i></b>	<b><i>Less Than Significant with Mitigation Incorporation</i></b>	<b><i>Less Than Significant Impact</i></b>	<b><i>No Impact</i></b>
a) Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?			X	
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?			X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

***Background***

The *Traffic Impact Analysis* (June 2019) was prepared by KD Anderson & Associates, Inc. for the proposed project. The following is a summary of the report, which is contained in Appendix C.

**Existing Roadway Network**

The network of roadways in and around Hughson consists of arterials, collectors and local streets. The closest major highway, SR 99, is approximately 4.5 miles west of Hughson, where it passes through the community of Ceres, connecting through Modesto and Stockton to points north, and through Merced and Fresno to points south.

Many of Hughson's streets have existed since the earliest days of the City's development. The roadway system is comprised of arterials, collectors and local street; all of which are two-lane with one lane in each direction.

**Arterials**

Hughson's arterial streets are the primary movers of traffic and provide the primary routes within and through the city, and that also carry traffic to and from the regional highways and other communities. Santa Fe Avenue is an arterial that runs northwest-southeast through Hughson, parallel to the railroad. Santa Fe Avenue's alignment cuts across the orthogonal grid that characterizes Hughson's roadway system, complicating circulation patterns since all roadway intersections with Santa Fe Avenue have a skewed configuration. Intersection improvements along Santa Fe Avenue are also limited due to the presence of the adjoining railroad and canals.

Other existing arterials follow a grid pattern. Geer Road runs north-south along Hughson's eastern Sphere Of Influence (SOI) boundary, ultimately connecting Hughson to Turlock to the south and Oakdale to the north. Hatch Road, Whitmore Avenue and Service Road are east-west arterials that connect Hughson to Ceres and SR 99.

**Collectors**

The backbone of the City's roadway system consists of its collector streets, which connect arterial streets to local streets. The collector street system is also oriented around a grid. Existing

collector streets include Tully Road, Charles Street, 7<sup>th</sup> Street and Euclid Avenue, which run north-south, Fox Road and Hughson Avenue, which run east-west.

### Local Streets

The remainder of Hughson's roadways are considered local streets that serve to connect vehicles from individual neighborhoods to the collector system. In some of the City's southern portions, older streets were developed based on previous County standards and have substandard and potentially dangerous intersections with adjoining arterials. Local streets in newer residential subdivisions are generally oriented around cul-de-sacs and non-direct through streets that lack the connectivity of Hughson's older neighborhoods. In the area of the project, local streets of importance include Walnut Haven Drive, Graybark Lane, Leaflet Lane, Flora Vista Drive and Estancia Drive.

### **Study Intersections**

The following four study intersections have been included in the analysis:

1. Santa Fe Avenue / Hatch Road;
2. Hatch Road / Tully Road;
3. Santa Fe Avenue / Los Alamos Drive; and
4. Tully Road / Fox Road.

The following is a detailed description of the configurations and controls of the study area intersections:

- The Santa Fe Avenue / Hatch Road intersection is controlled by a traffic signal. All intersection legs have a single through travel lane and a separate left turn lane. Separate right turn lanes are available on the eastbound Hatch Road and southbound Santa Fe Avenue approaches. The intersection adjoins the BN&SF railroad, and the west Hatch Road leg crosses the railroad. As a result, the stop bar on the eastbound approach has been moved westerly beyond the railroad tracks to ensure that the tracks will be clear when a train approaches. There are no crosswalks striped at this intersection.
- The Hatch Road / Tully Road intersection is a "tee" intersection controlled by a stop sign on the northbound Tully Road approach across a canal. Each approach has a single through travel lane, and a separate left turn lane is striped on westbound Hatch Road. There are no crosswalks or sidewalks at the intersection.
- The Santa Fe Avenue / Los Alamos Drive intersection is a "tee" intersection controlled by a stop sign on the westbound Los Alamos Drive approach. A southbound left turn lane exists on Santa Fe Avenue, and a corresponding "merge lane" accommodates left turns from Los Alamos Drive onto southbound Santa Fe avenue. A separate northbound right turn lane also exists on Santa Fe Avenue. There are no crosswalks at the intersection but sidewalks exist on the east side of the intersection.
- The Tully Road / Fox Road intersection is controlled by an all-way stop. Each approach is a single lane. While there are no striped crosswalks, each corner has sidewalk and handicap ramps.

### **Existing Traffic Volumes**

To quantify existing traffic conditions, a base of current daily and peak hour traffic volume information was assembled from new traffic counts completed by the consultant. New traffic counts were made at most locations on March 19, 2019 when area schools were in session.

## Level of Service (LOS) Calculation

To quantitatively evaluate traffic conditions and to provide a basis for comparison of operating conditions with and without project generated traffic, Levels of Service were determined at study area intersections and roadway segments. "Level of Service" (LOS) is a quantitative measure of traffic operating conditions whereby a letter grade "A" through "F" is assigned to an intersection. LOS "A" through "F" represents progressively worsening traffic conditions. The characteristics associated with the various LOS for intersections are presented in Table 25. The City of Hughson has identified LOS D as the minimum standard for all roadways and intersections.

**Table 25: LOS Criteria – Intersections**

LOS	Description (for Signalized Intersections)	Average Delay (Seconds/Vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10.0	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

NOTE: LOS = LEVEL OF SERVICE; V/C RATIO= VOLUME-TO-CAPACITY RATIO. LOS AT SIGNALIZED INTERSECTIONS AND ROUNDABOUTS BASED ON AVERAGE DELAY FOR ALL VEHICLES. LOS AT UNSIGNALIZED INTERSECTIONS IS REPORTED FOR ENTIRE INTERSECTION AND FOR MINOR STREET MOVEMENT WITH GREATEST DELAY.

SOURCE: TRANSPORTATION RESEARCH BOARD 2016.

## Intersection LOS Methodology

Levels of Service were calculated for this study using the methodology contained in the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM) using Synchro 10.0 software. The overall Level of Service for intersections was determined based on the average length of delays for all motorists at signalized intersections and all-way stop controlled intersections. At un-signalized intersections controlled by side-street stop signs the reported Level of Service is that associated with the "worst case."

## Roadway Segment LOS

The LOS on individual roadway segments was determined based on daily traffic volume thresholds identified in the City of Hughson General Plan Update - Existing Conditions Report.

Volume / capacity thresholds for urban streets presented in the HCM (1985) were employed, and resulting thresholds specific to roadway type are presented in Table 26.

**Table 26: General LOS Thresholds Based on Daily Traffic Volumes**

Street Classification	Lanes	Control	Daily Traffic Volume at LOS		
			C	D	E
Collector	2	Undivided	7,700	11,600	12,900
Arterial	2	Undivided	9,200	13,700	15,450
	4	Divided	20,100	30,200	33,200

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

## Traffic Analysis Scenarios

The study intersections were evaluated for the following four scenarios:

- Baseline Conditions;
- Baseline Plus Project Conditions;
- Cumulative Conditions; and
- Cumulative Plus Project Conditions.

The impacts of the project have been evaluated against a baseline condition that assumes existing traffic plus the trips associated with occupancy of other approved projects in Hughson. The City of Hughson identified three projects for inclusion in the analysis:

1. Province Place: 39 single family residential units located on Euclid Road north of Whitmore Avenue.
2. Euclid South: 69 single family residential units located on Euclid Road south of Hatch Road.
3. Walker Place Apartments: 20 multifamily residential units located on Fox Road east of Tully Road.

These projects could generate 1,165 daily trips, with 89 trips occurring in the a.m. peak hour and 118 trips generated in the p.m. peak hour. Because no traffic studies were completed for these projects, the trips associated with approved projects were assigned to the Hughson Street system under the trip distribution assumption noted later in this section for the proposed project. Resulting traffic volumes are noted in Figure 4 of Appendix C.

## Current Traffic Conditions / LOS

### Intersection LOS

Current a.m. and p.m. peak hour LOS were calculated at existing study intersections (Refer to Appendix C for calculation worksheets) under “Baseline” conditions, and the results are presented in Table 27. In each case the observed Peak Hour Factor (PHF) has been employed to describe conditions occurring during the peak 15 minutes within each hour.

**Table 27: Baseline Intersection LOS**

Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)
Santa Fe Ave. / Hatch Rd.	Signal	C	34.2	C	33.8
Santa Fe Ave. / Los Alamos Dr. WB Approach	WB Stop	E	12.8	B	11.8
Tully Rd. / Hatch Rd. NB Approach	NB Stop	C	15.2	C	18.3
Tully Rd. / Fox Rd.	All-Way Stop	A	9.4	A	8.7

NOTES: WB = WESTBOUND; NB = NORTHBOUND; SEC/VEH = SECONDS PER VEHICLE.

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

As shown, all study area intersections operate at LOS C or better, which satisfies minimum LOS under City of Hughson standards.

### Traffic Signal Warrants

The extent to which current traffic conditions at un-signalized intersections might justify a traffic signal was evaluated based on the warrants contained in the Manual of Uniform Traffic Control Devices (MUTCD). Today, the volume of traffic occurring at the unsignalized study intersections does not satisfy Warrant 3 (peak hour warrants).

### Roadway Segment LOS

The daily traffic volumes observed on study area roads are noted in Table 28. For comparison, the table also presents traffic volumes collected 15 years ago when the General Plan Update EIR was prepared (2004). As indicated, all arterial and collector roads currently carry volumes that satisfy the City of Hughson's minimum LOS D standard. As indicated, the current daily traffic volumes are only slightly changed from those collected in 2004. The volume on Hatch Road is only four percent higher, while the volume on Santa Fe Avenue has increased by 10 percent. The volume on Tully Road has dropped slightly.

**Table 28: Current Roadway Segment LOS Based on Daily Traffic Volume**

Roadway	Segment	Classification	Daily Volume		
			Lanes	2004 / 2019	LOS
Hatch Rd.	Santa Fe Ave. to Tully Rd.	Arterial	2	10,525/10,909	D
Tully Rd.	Hatch Rd. to Narcisco Way	Collector	2	2,251/2,163	A
Santa Fe Ave.	Hatch Rd. to Los Alamos Dr.	Arterial	2	7,764/8,555	C
Walnut Haven Dr.	Heartnut Way to Tully Rd.	Local	2	453	A <sup>1</sup>
Graybark Ln.	Heartnut Way to Tully Rd.	Local	2	628	A <sup>1</sup>
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	Local	2	297	A <sup>1</sup>
Flora Vista Dr.	Project to Los Alamos Dr.	Local	2	484	A <sup>1</sup>
Estancia Dr.	Leaflet Ln. to Flora Vista Dr.	Local	2	97	A <sup>1</sup>
Flora Vista Dr.	Estancia Dr. to Ester Marie Ave.	Local	2	769	A <sup>1</sup>
Fox Rd.	Ester Marie Ave. to Tully Rd.	Local	2	926	A <sup>1</sup>

NOTES: <sup>1</sup> BASED ON TWO-LANE COLLECTOR THRESHOLDS.



*SOURCE: KD ANDERSON & ASSOCIATES, 2019.*

The daily volumes on local streets in the area immediately south of the project would be indicative of LOS C conditions if the City's LOS thresholds for collector streets were applied to local streets. It is important to note, however, that in many communities the residents living along local streets begin to complain of the effects of increased traffic at volume levels far below the actual traffic capacity of the street. Driveway access, noise, and pedestrian conflicts are common complaints, rather than delay at intersections. While the City of Hughson has not adopted guidelines for acceptable traffic volume on local streets, many other communities have determined that 3,000 vehicles per day represents the desirable maximum volume for local streets. In this case, all the local streets addressed herein carry volumes that are below that level, which suggests that current conditions can be judged to be acceptable.

### **Pedestrian / Bicycle Facilities**

Although pedestrian and bicycle facilities do not exist along the project's Santa Fe Avenue frontage currently, sidewalks and bicycle lanes have been constructed in other locations as northern Hughson has been developed. Sidewalk exists on the local streets to the south and east of the project. Bicycle facilities are limited in Hughson. The City's Non-Motorized Transportation Plan (NMTP) indicates where facilities may be developed in the future.

Chapter 1000 of the Caltrans Highway Design Manual defines three classes of bicycle facilities and details the minimum requirements for those facility types:

- Class 1 Bicycle Paths: a paved right of way completely separated from any street or highway.
- Class 2 Bicycle Lanes: a striped and stenciled lane for one-way travel on a street or highway.
- Class 3 Bicycle Routes: a typical roadway identified as a preferred bicycle route with signage. They may also include shared use lane markings, "SHARE THE ROAD" signage, or wide shoulders.
- Class 4 Separated Bikeways: a bike lane speared from vehicular traffic by a physical barrier.

The NMTP indicates that a Class 1 trail may be developed on Hatch Road in the future and that Class 2 Bicycle Lanes may be developed on Santa Fe Avenue, on Fox Road east of Tully Road, and on Tully Road south of Fox Road. Class 3 bicycles routes are planned on Flora Vista Drive and on Tully Road north of Fox Road.

### **Transit Facilities**

The Hughson area is served by Stanislaus Regional Transit (StaRT). Route 61 links the rural communities of Empire, Waterford, and Hughson with Ceres and with the Transportation Center in Modesto. Route 61 operates Monday through Friday between 6:15 a.m. and 7:45 p.m. with reduced hours on Saturday. This route generally follows Whitmore Avenue through Hughson with two designated stops at Hughson Avenue and 3<sup>rd</sup> Street and at Whitmore Avenue and Tully Road.

### **Project Trip Generation**

The amount of traffic generated by development of the project has been estimated based on the trip generation characteristics of planned uses. Table 29 presents the trip generation rates

employed for this analysis. Rates for residential uses were drawn from the *Institute of Transportation Engineers (ITE)* publication *Trip Generation, 10<sup>th</sup> Edition*.

**Table 29: Trip Generation Rates**

Land Use	Unit	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single Family Residential	DU	9.44	0.19	0.56	0.74	0.63	0.36	0.99
General Commercial	KSF	37.75	0.58	0.37	0.95	1.83	1.98	3.81

NOTES: DU = DWELLING UNIT; KSF = THOUSAND SQUARE FEET.

SOURCE: INSTITUTE OF TRANSPORTATION ENGINEERS, TRIP GENERATION MANUAL, 10<sup>TH</sup> EDITION.

As indicated, the standard ITE rate for single family residences has been selected for the project. The rate that is applicable to development under the current SC General Plan land use category has also been noted.

As shown in Table 30, the project's 299 residences would be expected to generate 2,823 daily trips with 221 trips in the a.m. peak hour and 296 trips in the p.m. peak hour.

Under the current General Plan land use designations, the project site could be occupied by 19 acres of commercial development and 37 acres of single family residential. The General Plan EIR assumed that this commercial area would be developed with retail shopping, and at the standard Floor Area Ratio (FAR) for retail centers (i.e., 0.25), roughly 207,000 sf of retail space would be expected. Combined with the adjoining retail space, the existing General Plan land use designations for the site could generate gross totals of 11,061 daily trips, with 452 trips in the a.m. peak hour and 1,119 trips in the p.m. peak hour. After discount for retail pass by trips, the net new totals for the existing General Plan land use designations are 8,404 daily, 351 a.m., and 851 p.m. peak hour trips.

**Table 30: Parkwood Subdivision Trip Generation**

Land Use	Quantity	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Proposed Development								
SF Residential (LDR)	99 DU	935	18	55	73	62	36	98
SF Residential (MDR)	200 DU	1,888	37	111	148	124	74	198
Proposed Development Subtotal		2,823	55	166	221	186	110	296
Development Under Current General Plan Designations								
Service Commercial (19 acres @ 0.25 FAR)	207 KSF	7,814	122	75	197	379	409	788
Passby Trips	34%	2,657	34	33	67	134	134	268
Net New Trips	--	5,157	88	42	130	245	275	520
SF Residential (LDR)	96 DU	906	18	53	71	60	35	95
SF Residential (MDR)	248 DU	2,341	46	138	184	148	88	236
General Plan Development – Total		11,061	186	266	452	587	532	1,119
General Plan Development – Net New		8,404	152	233	385	453	398	851

NOTES: DU = DWELLING UNIT; KSF = THOUSAND SQUARE FEET; FAR = FLOOR-AREA-RATIO.

SOURCE: INSTITUTE OF TRANSPORTATION ENGINEERS, TRIP GENERATION MANUAL, 10<sup>TH</sup> EDITION.

## **Planned Improvements**

Consistent with City policy, development of the project site will be required to install frontage improvements as development occurs. This will include the widening of Santa Fe Avenue to ½ of its ultimate section. The project's internal street system will be constructed, including extensions of Flora Vista Drive and Estancia Drive into the site. In addition, the project will include a stub at its northern corner that will allow a future extension by others to Narcisco Drive.

## **Trip Distribution and Assignment**

### Trip Distribution

The regional distribution of the new trips generated by the project will reflect the project's location on the northwestern portion of the urbanized Hughson area. The distribution of project trips has been determined from review of existing local traffic patterns as well as consideration of traffic patterns suggested by the City of Hughson General Plan Update traffic model. The distribution pattern identified in the General Plan EIR for new residential area under cumulative conditions was adjusted to reflect the elimination of a portion of the community's SC land use. The General Plan EIR distribution was further reduced to represent short term conditions based on the location of existing retail and employment in Ceres, Modesto, and Turlock.

The relationship between new residential development and Hughson schools has been considered in developing the a.m. peak hour distribution assumptions. Many parents will elect to drop off students before continuing on as part of a commute trip. Because area schools lie generally to the east of the project site, the share of project trips using local roads to the east will be higher in the a.m. peak hour than in the p.m.

### Trip Assignment

Project trips were assigned to the local area street system under the distribution assumptions presented above with the access assumptions described previously based on the "least time path" available from various locations within the Hughson area. The resulting "project only" trip assignment for residentially generated traffic alone is presented in Figure 4 of Appendix C.

## **Regulatory Setting**

### City of Hughson General Plan

The City of Hughson General Plan Circulation Element identifies policies related to transportation and traffic standards.

### City of Hughson Non-Motorized Transportation Plan

The City of Hughson adopted the NMTP in 2008 to guide the development of pedestrian and bicycle facilities.

### Standards of Significance

For this analysis, the proposed project would have a significant impact to transportation and traffic if the project would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of

vehicle trips, the volume-to-capacity ratio on roads, or reduction in LOS), either during the plus project condition, or the cumulative plus project condition.

- Exceed, either individually or cumulatively, a LOS standard established by the City of Hughson designated roads or highways.

*Roadways/Signalized Intersections:* The project is considered to have a significant effect if it would:

- Cause deterioration of an intersection from LOS D on arterial and collector streets and intersections to LOS E or LOS F.
- The City of Hughson has not established criteria for locations where background conditions already exceed or are forecast to exceed LOS D. For this analysis the criteria adopted by Stanislaus County, and by the Cities of Ceres, Modesto and Turlock have been considered. A traffic impact is significant if it causes an increase in average delay of 5 or more seconds for a signalized intersection operating at LOS E or LOS F under Baseline (No Project) conditions, or increases the daily traffic volume by 5% on a road that is already operating at LOS E or F.
- At unsignalized intersections an impact is significant if it causes deterioration of a controlled movement at an un-signalized intersection from LOS D (or better) to LOS E or LOS F, or at intersections where a controlled movement already operates at LOS E or F, if the following criteria are met:
  1. Project traffic results in satisfaction at the peak hour volume traffic signal warrant, and;
  2. Project traffic increases a minor movement delay by more than 5 seconds; or
  3. Where the peak hour signal warrant is met without the project traffic and delay cannot be estimated by HCM methods, the project increases traffic by 10 or more vehicles per lane on the controlled approach during the peak hour.

#### *Responses to Checklist Questions*

**Response a):** As noted above, facilities for pedestrians and bicyclists are present on the streets adjacent south and east of the project site. Sidewalks will be created along the new streets in the subdivision. Additionally, a paved bike and walking/jogging path (Class I Bike Trail) would be provided along the TID Ceres canal. Thus, facilities will be available for school children to walk to community schools. Further, the project's Santa Fe Avenue frontage improvements include sidewalks and Class 2 Bike Lanes. With these improvements, the project's impacts to pedestrian and bicycle facilities would be *less than significant*.

The residents within the project may create the demand for transit services as an alternative to the private automobile. However, assuming the typical modal split achieved in urban areas with transit service (i.e., one to two percent of trips), the number of project-related StarRT riders might reach 40 to 80 per day. This demand can be accommodated by current services and would not justify changes to current transit routes. The project's impact to transit facilities would be *less than significant*.

#### **Response b):**

The peak hour LOS occurring at study area intersections and LOS on roadway segments based on daily volume with development of the project have been evaluated.

## Baseline Plus Project Scenario

### Roadway Segment LOS

As noted in Table 31, the addition of project trips will not result in any location carrying daily volumes in excess of the City of Hughson minimum LOS D goal. Thus, impacts to roadway segments under the Baseline Plus Project scenario would be less than significant.

The project will add traffic to the local streets south and east of the site. While not an adopted significance criterion, in comparison to the planning level daily volume thresholds typically employed by other communities, the project will not result in any local street carrying volumes that exceed an acceptable level.

**Table 31: Baseline Plus Project Roadway Segment LOS Daily Traffic Volumes**

Roadway	Segment	Class.	Lanes	Baseline			Baseline + Project		
				Daily Volume		LOS	Daily Volume		LOS
				Approved Projects Only	Total		Project Only	Total	
Hatch Rd.	Santa Fe Ave. to Tully Rd.	Arterial	2	344	11,253	D	25	11,278	D
Tully Rd.	Hatch Rd. to Narcisco Way	Collector	2	20	2,183	A	25	2,208	A
Santa Fe Ave.	Hatch Rd. to Project Access	Arterial	2	56	8,611	C	1,275	9,886	D
Santa Fe Ave.	Project Access to Los Alamos Dr.	Arterial	2	56	8,611	C	935	9,546	D
Walnut Haven Dr.	Heartnut Way to Tully Rd.	Local	2	0	453	A <sup>1</sup>	45	498	A <sup>1</sup>
Graybark Ln.	Heartnut Way to Tully Rd.	Local	2	0	628	A <sup>1</sup>	221	848	A <sup>1</sup>
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	Local	2	0	297	A <sup>1</sup>	265	562	A <sup>1</sup>
Flora Vista Dr.	Project to Los Alamos Dr.	Local	2	0	484	A <sup>1</sup>	365	849	A <sup>1</sup>
Estancia Dr.	Leaflet Ln. to Flora Vista Dr.	Local	2	0	97	A <sup>1</sup>	10	107	A <sup>1</sup>
Flora Vista Dr.	Estancia Dr. to Ester Marie Ave.	Local	2	22	791	A <sup>1</sup>	185	976	A <sup>1</sup>
Fox Rd.	Ester Marie Ave. to Tully Rd.	Collector	2	22	948	A <sup>1</sup>	185	1,133	A <sup>1</sup>

NOTES: <sup>1</sup> BASED ON TWO-LANE COLLECTOR THRESHOLDS

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

### Intersection LOS

Projected peak hour traffic volumes have been used to project LOS with completion of the project. Table 32 compares “Baseline” and “Baseline Plus Project” LOS based on those volumes.

As shown, while development of the project will increase the volume of traffic passing through study area intersections, resulting traffic conditions will not exceed the City’s minimum LOS D

standard. Thus, impacts to study intersections under the Baseline Plus Project scenario would be less than significant.

**Table 32: Baseline Plus Project Intersection LOS**

Intersection	Control	AM Peak Hour				PM Peak Hour				Signal Warrant Met?
		Baseline		Baseline + Project		Baseline		Baseline + Project		
		LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	
Santa Fe Ave. / Hatch Rd.	Signal	D	35.6	D	47.7	C	34.7	D	39.9	-
Santa Fe Ave. / Los Alamos Dr. WB Approach	WB Stop	B	12.9	B	14.3	B	11.8	B	13.7	No
Tully Rd. / Hatch Rd. NB Approach	NB Stop	C	15.7	C	15.7	C	19.3	C	19.5	No
Tully Rd. / Fox Rd.	All-Way Stop	A	9.5	A	9.7	A	8.8	A	8.9	No
Santa Fe Ave. / West Project Access WB Approach	WB Stop	--	--	C	15.5	--	--	C	16.2	No

NOTES: WB = WESTBOUND; NB = NORTHBOUND; SEC/VEH = SECONDS PER VEHICLE.

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

### Traffic Signal Warrants

Project traffic volumes have been compared to MUTCD peak hour warrants. None of the unsignalized intersections carry traffic volumes that satisfy traffic signal warrants.

### **Cumulative Plus Project Scenario**

The following section considers the impacts of the project within the context of long term traffic conditions that may accompany the development of regional circulation system improvements, regional development, and non-project land use assumed with implementation of the City of Hughson General Plan Update. To evaluate the impacts of the project on future traffic conditions in the project area, cumulative traffic volumes with and without the project (i.e. no site development) were identified and assessed.

Assuming “build out” of the General Plan represents a very conservative approach to forecasting future traffic conditions on Hughson’s streets, and based on the trends that have occurred since the General Plan was adopted, full build out may take many years and extend well beyond the twenty year horizon typically employed for traffic volume forecasting. Therefore, an alternative approach was taken to estimate the background traffic volume occurring in twenty years.

### Assumptions

Long term traffic volumes that are based on regional population growth trends were created with and without the proposed project. Between 2010 and 2018, the population of Stanislaus County increased from 515,165 to 549,815, or 6.7 percent over eight years. On an annualized basis, the



growth rate was 0.8 percent per year. The cumulative analysis conservatively assumes that background traffic without the project will increase by 1.0 percent annually, or 22 percent over twenty years.

The Cumulative No Project condition assumes that circulation system improvements are made but that no development occurs on the project site. “Plus Project” traffic volume forecasts were created by identifying the project’s trip assignment under long term conditions and manually adding these trips from the Year 2040 “No Project” values.

The analysis of cumulative traffic conditions conservatively assumes that existing peak hour factors (PHF’s) at study area intersections will continue in the future. While it may be argued that PHF’s may change in the future as background traffic increases, the presence of local schools will continue to influence peaking characteristics, particularly in the a.m. peak hour. For this reason, this analysis assumes a “worst case” view by retaining existing PHF’s.

### Future Improvements

Because the long-term cumulative analysis assumes community wide growth, it is appropriate to recognize the improvement needs that were previously identified by the General Plan EIR. While no improvements have been initially assumed in this cumulative analysis in order to present a “worst case” condition, the General Plan EIR suggested that the following improvements would be needed to accommodate General Plan growth, including the current General Plan land uses on the project site:

- Widening of Santa Fe Avenue to four lanes;
- Widening of Hatch Road to four lanes;
- Signalization of Hatch Road / Mountain View Drive intersection;
- Signalization of Hatch Road / Tully Road intersection;
- Signalization of Santa Fe / Mountain View Drive intersection.

Of these improvements the signalization of the Hatch Road / Mountain View Drive intersection is affected by the Parkwood GPA, as the improvement is no longer likely to be needed with the implementation of the proposed project. The previous General Plan EIR assumptions for the layout of the site’s commercial development assumed access at the Hatch Road / Mountain View Drive intersection, and the traffic volume under that original scenario would justify a traffic signal at General Plan buildout. However, that connection to Hatch Road is no longer planned with the proposed project, and this signal will not be needed.

The City of Hughson has adopted a fee program to provide a mechanism to allow local development to contribute its fair share to the cost of improvements identified in the General Plan EIR. The current fee is \$4,101 per residential dwelling / lot.

Appendix K of the StanCOG RTP/SCS presents a list of circulation system improvements anticipated over the long term by the County and local agencies. Table 33 notes projects in the project area, along with assumed funding sources.

**Table 33: Selected Tier I Improvements from 2018 RTP**

#	Location	Limits	Description	Cost (Millions)
H06	Whitmore Ave. & Santa Fe Ave.	--	Construct Roundabout	\$1.00 <sup>1</sup>
H07	Euclid Ave.	Hatch Rd. to Whitmore Ave.	Complete Streets improvements	\$2.63 <sup>2</sup>
H08	7 <sup>th</sup> St.	Whitmore Ave. to Santa Fe Ave.	Improve to 2-lane Major Collector	\$2.69 <sup>2</sup>
H09	7 <sup>th</sup> St. & Santa Fe Ave.	--	Realign Roadway	\$0.35 <sup>3</sup>
H11	Tully Rd.	Whitmore Ave. to City limit	Improve to 2-lane Major Collector	\$0.45 <sup>4</sup>
H12	Santa Fe Ave.	South of Hatch Rd.	Construct Roundabout	\$1.00 <sup>5</sup>
H13	Santa Fe Ave.	North of 7 <sup>th</sup> St.	Construct Roundabout	\$1.00 <sup>5</sup>
H14	Various Locations	--	Roadway Rehabilitation	\$8.55 <sup>6</sup>
S62	Santa Fe Ave.	Keyes Rd. to Geer Rd.	Widen to 3 lanes	\$4.41 <sup>7</sup>
S63	Santa Fe Ave.	Geer Rd. to Hatch Rd.	Widen to 3 lanes	\$3.12 <sup>7</sup>
S64	Santa Fe Ave.	Hatch Rd. to Tuolumne River	Widen to 3 lanes	\$2.81 <sup>7</sup>

**NOTES:**<sup>1</sup> FUNDING INCLUDES COMBINATION OF STBGP, MEASURE L AND CMAC<sup>2</sup> FUNDING INCLUDES DEVELOPER IMPACT FEES, SB1<sup>3</sup> FUNDING INCLUDES DEVELOPER IMPACT FEES<sup>4</sup> FUNDING INCLUDES DEVELOPER IMPACT FEES, STBGP, SB 1<sup>5</sup> FUNDING INCLUDES DEVELOPER IMPACT FEES, CMAQ<sup>6</sup> FUNDING INCLUDES STBGP, MEASURE L<sup>7</sup> MEASURE L FUNDING

SOURCE: KD ANDERSON &amp; ASSOCIATES, 2019.

**Traffic Volume Forecasts**

Cumulative Year 2040 daily traffic volume projections are presented for with and without project conditions in Table 33.

Peak hour volumes were developed for conditions with and without the project. Figure 7 in Appendix C presents a.m. and p.m. peak hour volumes assuming cumulative development without the occupancy of the project site. Figure 8 in Appendix C presents “Cumulative Plus Project” volumes.

**Roadway Segment LOS**

Table 34 identifies long term daily traffic volumes and LOS on study area streets with and without the project. As indicated, projected volumes will create LOS D or better conditions on all segments. Because LOS D satisfies the City’s minimum standard, the cumulative impact is not significant based on LOS.

The project will contribute to cumulative traffic increases on the local roads south of the site which result as other portions of Hughson develop in the future. The resulting traffic volumes will still remain well below the LOS D threshold and are all below the planning level threshold

typically employed by communities to categorize acceptable traffic volume on local streets (i.e., 3,000 ADT). Thus, the project's cumulative impact to roadway segments is not significant.

**Table 34: Cumulative Plus Project Roadway Segment LOS Daily Traffic Volumes**

Roadway	Segment	Class	Lanes	Existing Daily Volume	Cumulative		Cumulative + Project		
					Daily Vol.	LOS	Daily Vol.		LOS
							Project Only	Total	
Hatch Rd.	Santa Fe Ave. to Tully Rd.	Arterial	2	10,909	13,300	D	25	13,325	D
Tully Rd.	Hatch Rd. to Narcisco Way	Collector	2	2,163	2,640	B	25	2,665	B
Santa Fe Ave.	Hatch Rd. to Project Access	Arterial	2	8,555	10,440	D	1,275	11,715	D
Santa Fe Ave.	Hatch Rd. to Los Alamos Dr.	Arterial	2	8,555	10,440	D	935	11,375	D
Santa Fe Ave.	South of Los Alamos Dr.	Arterial	2	--	9,300	D	1,095	10,395	D
Walnut Haven Dr.	Heartnut Way to Tully Rd.	Local	2	453	550	A <sup>1</sup>	45	595	A <sup>1</sup>
Graybark Ln.	Heartnut Way to Tully Rd.	Local	2	626	760	A <sup>1</sup>	225	985	A <sup>1</sup>
Leaflet Ln.	Flora Vista Dr. to Heartnut Way	Local	2	297	360	A <sup>1</sup>	265	625	A <sup>1</sup>
Flora Vista Dr.	Project to Los Alamos Dr.	Local	2	484	590	A <sup>1</sup>	365	955	A <sup>1</sup>
Estancia Dr.	Leaflet Ln. to Flora Vista Dr.	Local	2	97	120	A <sup>1</sup>	1	130	A <sup>1</sup>
Flora Vista Dr.	Estancia Dr. to Ester Marie Ave.	Local	2	769	940	A <sup>1</sup>	185	1,125	A <sup>1</sup>
Fox Rd.	Ester Marie Ave. to Tully Rd.	Collector	2	926	1,130	A <sup>1</sup>	185	1,315	A <sup>1</sup>

NOTES: <sup>1</sup> BASED ON TWO-LANE COLLECTOR THRESHOLDS.

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

### Intersection LOS

The results of LOS analysis for both peak hours are shown in Table 35 and are further described in the following text.

**Table 35: Cumulative Plus Project Intersection LOS**

Intersection	Control	AM Peak Hour				PM Peak Hour				Signal Warrant Met?
		Cumulative		Cumulative + Project		Cumulative		Cumulative + Project		
		LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	LOS	Ave. Delay (sec/veh)	
Santa Fe Ave. / Hatch Rd.	Signal	D	47.0	D	53.5	D	47.8	D	54.2	--
Santa Fe Ave. / Los Alamos Dr. WB Approach	WB Stop	C	15.0	C	17.2	B	13.2	C	15.8	No
Tully Rd. / Hatch Rd. NB Approach	NB Stop	C	20.1	C	20.1	D	26.2	D	26.5	No
Tully Rd. / Fox Rd.	All-Way Stop	B	10.6	B	11.0	A	9.4	A	9.6	No
Santa Fe Ave. / West Project Access WB Approach	WB Stop	--	--	C	18.4	--	--	C	18.9	No

NOTES: WB = WESTBOUND; NB = NORTHBOUND; SEC/VEH = SECONDS PER VEHICLE.

SOURCE: KD ANDERSON & ASSOCIATES, 2019.

### Intersection LOS (Without the Project)

As noted in Table 35, if no development occurs on the project site, all intersections will operate with LOS that satisfy the City's minimum LOS D standard. *Intersection LOS (With the Project)*

As noted in Table 35, the addition of Project trips to cumulative background conditions increases the cumulative traffic volume, but all intersections are projected to operate with Levels of Service that satisfy the City's minimum LOS D standard. The project's cumulative impact is not significant based on Level of Service, and mitigation is not required.

### Conclusion

In conclusion, in the Baseline Plus Project and Cumulative Plus Project conditions, all roadway segments and intersections would operate with LOS that satisfy the City's minimum LOS D standard. Therefore, impacts would be considered ***less than significant***.

**Response c-d):** No site circulation or access issues have been identified that would cause a traffic safety problem/hazard or any unusual traffic congestion or delay. Signalization of the Santa Fe Avenue / Project Access intersection would alleviate delays in the Cumulative condition.

All emergency vehicles arriving to and from the proposed project would be able to enter via Santa Fe Avenue, Flora Vista Drive, Estancia Drive, or Hatch Road. All accesses would be designed to City standards that accommodate turning requirements for fire trucks. These multiple entry/exit points provide flexibility for emergency vehicles to access or evacuate from multiple directions during an emergency.

There are no safety, capacity, or sight distance issues identified with the project site plan. Therefore, impacts associated with design features and emergency access would be considered ***less than significant***.



**XVIII. TRIBAL CULTURAL RESOURCES**

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
a) 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:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?		X		
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe.		X		

**Responses to Checklist Questions**

**Responses a), b):** A record search was conducted for the project site and surrounding area through the CCIC of the California Historical Resources Information System (CCIC file No.: 10995N). The record search indicates that: the project site does not contain any recorded prehistoric or historic archaeological resources or historic buildings. Additionally, with the regular disturbance associated with the agricultural operations it is anticipated that any buried resources would have been found over time.

Based on the above information, the project site has a low to moderate potential for the discovery of prehistoric, ethnohistoric, or historic archaeological sites that may meet the definition of TCRs. Although no TCRs have been documented in the project site, the project is located in a region where significant cultural resources have been recorded and there remains a potential that undocumented archaeological resources that may meet the TCR definition could be unearthed or otherwise discovered during ground-disturbing and construction activities. Examples of significant archaeological discoveries that may meet the TCR definition would include villages and cemeteries. Due to the possible presence of undocumented TCRs within the project site, construction-related impacts on tribal cultural resources would be potentially significant. With implementation of the following mitigation measure, the proposed project would have a **less than significant** impact related to tribal cultural resources.

**Mitigation Measure(s)**

**Mitigation Measure TRIBAL-1:** *If cultural resources are discovered during project-related construction activities, all ground disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery. The archaeologist shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts. If the find is determined by the lead agency in consultation with the Native American tribe traditionally and culturally affiliated with the geographic area of the project site to be a tribal cultural resource and the discovered archaeological resource cannot be avoided, then applicable mitigation measures for the*

*resource shall be discussed with the geographically affiliated tribe. Applicable mitigation measures that also take into account the cultural values and meaning of the discovered tribal cultural resource, including confidentiality if requested by the tribe, shall be completed (e.g., preservation in place, data recovery program pursuant to PRC §21083.2[i]). During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project site.*

***XIX. UTILITIES AND SERVICE SYSTEMS***

<b><i>Would the project:</i></b>	<b><i>Potentially Significant Impact</i></b>	<b><i>Less Than Significant with Mitigation Incorporation</i></b>	<b><i>Less Than Significant Impact</i></b>	<b><i>No Impact</i></b>
a) Require or result in the relocation or construction of new or expanded water, wastewater or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments?			X	
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?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			X	

***Responses to Checklist Questions*****Responses a)-c):****Water**

The City of Hughson owns, operates, and maintains its own water utility. Hughson's existing water infrastructure system consists of three active well sources, 750,000-gallon storage tank, and a water distribution system to provide potable and fire suppression water to residential, commercial, and industrial uses.

The City relies solely upon local groundwater for its water source, using high-production wells for water production. The City has experienced challenges with source water quality, beginning in 2006, with the adoption of a new and more stringent arsenic regulation. Arsenic is a naturally occurring metal often found in Central Valley groundwater and is known to cause chronic health issues at toxic levels. The local groundwater in the Hughson area commonly has arsenic at, or slightly above, the state and federal limit for arsenic in drinking water. As a result, most wells in the Hughson system are either in violation of the arsenic standard or equipped with water treatment systems to remove arsenic to meet the standard. In 2017, the State of California adopted a new standard for a man-made contaminant called 1,2,3-TCP. As of this date, all of the City's wells are in violation of this new standard. The City plans to install treatment for 1,2,3-TCP removal and is actively working to identify funding to pay for these needed treatment facilities.

In addition to arsenic and 1,2,3-TCP, other man-made contaminants have been found in the local groundwater, including DBCP (soil fumigant) and nitrate (fertilizer). Two (2) of the City's production wells were forced out-of-service for these contaminants in the past few years. Water production lost from these two wells is being replaced with the Well 7 Replacement Project, scheduled to be completed in 2021. This project includes construction of two new wells. treatment for arsenic, and additional water storage for fire suppression and peak demands.

#### Proposed Project Water Demand

The project's water demand was estimated based on the land use and acreage and is summarized in Table 37. The project's average day demand (ADD) and max day demand (MDD) were estimated to be 0.163 million gallons per day (mgd) (or 162,516 gallons per day (gpd) and 0.325 mgd (or 325,032 gpd), respectively.

**Table 37: Parkwood Subdivision Project Water Demand Estimation<sup>(a)</sup>**

<b>Parameter</b>	<b>Units</b>	<b>Value</b>
Land Use	-	Medium Density Residential
Area	acres	56.04
Water Demand Factor	gpd/acre	2,900
ADD	gpd	162,516
MDD	gpd	325,032

NOTE: (A) PARKWOOD PROJECT WATER DEMAND ESTIMATION AS DOCUMENTED IN THE WATER STUDY FOR PARKWOOD SINGLE-FAMILY RESIDENTIAL DEVELOPMENT PREPARED BY MVE, INC. IN JANUARY 2020.

#### City of Hughson Existing and Projected Water Demands

Table 38 summarizes the City's annual well production from 2012 through 2016. Due to drought and resulting water conservation efforts, water production in 2015 and 2016 were lower than in previous years. California water code (Section 64554) requires public water systems maintain source capacity equal to or greater than the highest recorded demand in the past 10-years. The code specifies how the highest production is to be calculated, depending on the data available. As shown the Table 38, the highest demand year was 2013, at 575 MGY.

**Table 38: City of Hughson Well Production from 2012 to 2016<sup>(a)</sup>**

<b>Year</b>	<b>Annual Total Well Production (mgd)</b>	<b>Average Daily Well Production (mgd)</b>
2010	542	1.48
2011	541	1.42
2012	484	1.32
2013	575	1.58
2014	448	1.23
2015	397	1.09
2016	397	1.09
2017	418	1.15
2018	377	1.03
2019	414	1.13

NOTES: MGY = MILLION GALLONS PER YEAR; MGD = MILLION GALLONS PER DAY.

Hughson has committed water to other development projects currently under construction, approved with a development agreement, or otherwise planned for. These projects and their associated projected water demands are listed below in Table 39.

**Table 39: City of Hughson Development Projects<sup>(a)</sup> and Water Demands**

<b>Development Projects <sup>(a)</sup></b>	<b>Number of Units</b>	<b>Average Demand Factor, <sup>(c)</sup> gpd/du</b>	<b>ADD, mgd</b>	<b>MDD, <sup>(d)</sup> mgd</b>
Euclid South	69	543.5 <sup>(e)</sup>	0.04	0.09
Provence Place	39		0.02	0.045
Euclid North	50		0.03	0.7
Private System Consolidation	57		0.03	0.07
<b>Total</b>	<b>215</b>		<b>0.12</b>	<b>0.275</b>

NOTES: ADD = AVERAGE DAILY DEMAND; MDD = MAXIMUM DAILY DEMAND; MGY = MILLION GALLONS PER YEAR; MGD = MILLION GALLONS PER DAY.

(a) THE DEVELOPMENT PROJECTS AND NUMBER OF SINGLE-FAMILY LOTS IN EACH PROJECT WERE PROVIDED IN AN EMAIL COMMUNICATION FROM SEAN TOBIN, MID-VALLEY ENGINEERING, INC., DATED FEBRUARY 21, 2020.

(b) THE EUCLID SOUTH AND PARK PLACE DEVELOPMENTS ARE UNDER CONSTRUCTION. THE EUCLID NORTH PROJECT HAS BEEN APPROVED WITH A DEVELOPMENT AGREEMENT.

(c) THE AVERAGE DEMAND FACTOR IN GALLONS PER DAY PER DWELLING UNIT FOR THE SINGLE-FAMILY LOTS, DETERMINED IN THE 2020 PARKWOOD WATER STUDY, WAS USED TO ESTIMATE WATER DEMANDS FOR THE DEVELOPMENT PROJECTS.

(d) THE MDD WAS COMPUTED BY APPLYING PEAKING FACTOR OF 2.25 X ADD PER STATE OF CALIFORNIA WATER STANDARDS FOR PUBLIC WATER SYSTEMS. (e) THIS VALUE IS CONSISTENT WITH ESTIMATES OF PROJECTED WATER USE PER DWR CONSERVATION REQUIREMENTS FOR PUBLIC WATER SYSTEMS IN THE SAN JOAQUIN REGION (180 GPCD X 3.0 PERSONS PER HOUSEHOLD). HOWEVER, CURRENT UNIT WATER USE (GPD/DU) VALUES USED TO DETERMINE PERMIT REQUIREMENTS ARE HIGHER, APPROXIMATELY 706 GPD/DU. THE REDUCTION IN WATER USE FOR PROPOSED DEVELOPMENTS IS DUE TO CURRENT WATER CONSERVATION CODES AND STANDARDS.

Table 40 summarizes the City's current existing and projected water demands with the addition of the water demands from other proposed development projects and the Parkwood Subdivision. The City's total projected MDD is 4.18 mgd.

**Table 40: City of Hughson Current Existing and Projected Water Demands**

<b>Water Demands</b>	<b>ADD, mgd</b>	<b>MDD, <sup>(a)</sup> mgd</b>
Existing	1.58	3.54
Development Projects <sup>(b)</sup>	0.09	0.275
Parkwood Project	0.16	0.36
<b>Total</b>	<b>1.83</b>	<b>4.18</b>

NOTES: ADD = AVERAGE DAILY DEMAND; MDD = MAXIMUM DAILY DEMAND; MGY = MILLION GALLONS PER YEAR; MGD = MILLION GALLONS PER DAY.

(A) THE MDD WAS COMPUTED BY APPLYING PEAKING FACTOR OF 2.25 X ADD per State of California Water Standards.

(B) SEE TABLE 39.

### City of Hughson Water Supply

The City currently uses local groundwater as its only source of water supply. Prior to 2011, City had planned to supplement its groundwater supply with surface water purchased from the Turlock Irrigation District (TID) as part of the Regional Surface Water Supply Project (along with the Cities of Modesto, Turlock, and Ceres). However, the City no longer intends to be a participating member of the Project for surface water deliveries due to the high cost.<sup>2</sup> Recent

<sup>2</sup> Hughson's share of the cost to participate in the Regional Water Supply Plan was estimated to be approximately \$15 - \$20M, including costs to convey surface water to the City's distribution system. In addition, the City would still be required to build and maintain a full groundwater system for periods when the surface water is not available or deliveries reduced (e.g. multiple drought years). Finally, the cost of delivered surface water is normally 3-5x groundwater.



plans to improve and expand capacity of the City's water system consist of improving groundwater quality with treatment, use of non-potable sources for irrigation of large commercial and public landscapes, and implementing water conservation measures as required by state codes.

Prior to 2013, the City had five (5) water production wells that extract local groundwater for its water supply. Since 2013, the City added Well 8, but lost three (3) of its newer drinking water wells to contamination, including wells 5, 6, and 7. Each well had a separate contaminant causing it to be removed from service, including DBCP, arsenic, and nitrate, respectively. Thus, the City currently has three (3) groundwater wells (Wells 3, 4, and 8). However, none of the wells is in full compliance with federal and state drinking water requirements. Two (2) additional wells are under construction as part of the Well 7 Replacement Project to address the lost production since 2013.

In 2017, the State Water Resource Control Board (SWRCB) Division of Drinking Water (DDW) adopted regulation for 1,2,3-trichloropropane (TCP), setting a maximum contaminant level (MCL) of 0.005 micrograms per liter ( $\mu\text{g/L}$ ). In 2018, the City collected the first compliance samples for TCP from the active drinking water wells. TCP levels in all the active wells exceeded the MCL. A feasibility study was conducted to evaluate alternatives for TCP mitigation and is documented in the April 2018 *1,2,3-TCP Mitigation Feasibility Study*. Treatment with granular activated carbon (GAC) was determined to be the best solution to mitigate the 1,2,3-TCP contamination, and installation of GAC treatment systems for all the municipal supply wells is planned.

Specifically, the status of the City's wells are as follows:

- Wells 3, 4, and 8 are actively used for municipal supply. All three wells are in violation of 1,2,3-TCP;
- Well 8 is equipped with treatment and in compliance with arsenic standards;
- Well 4 is in violation of arsenic and requires treatment;
- Well 5 was removed from service, and its production capacity will be replaced by Well 10;
- Well 6 was converted to supply non-potable uses in 2013, due to elevated levels of arsenic and nitrate;
- Well 7 has been inactive since 2015, due to elevated levels of nitrate, and its production capacity will be replaced by Well 9.

The Well 7 Replacement Project is currently under construction and involves construction of Wells 9 and 10, installation of a treatment system for arsenic and manganese, and construction of a one-million-gallon water storage tank.

Currently the City has no source water production that meets state and federal water quality standards. Should the City successfully secure funding for 1,2,3-TCP treatment, Wells 3, 4, and 8 can be modified with treatment equipment to be in full compliance for 1,2,3-TCP. With completion of the Well 7 Replacement project in 2021, the City will have two (2) additional wells with treatment for long-term water supply. Since Well 4 requires treatment for arsenic, piping can be constructed to convey untreated water from Well 4 to the Well 7 Replacement facility for treatment.

Production flow rates for the municipal wells are summarized in Table 41.

**Table 41: Municipal Well Production Flow Rates**

<b>Well</b>	<b>Status</b>	<b>Flow Rate, <sup>(a)(b)</sup> gpm [mgd]</b>
3	Active – TCP violation	1,400 (2.02)
4	Active – TCP and arsenic violations	1,000 (1.44)
8	Active -TCP violation	1,500 (2.10)
9	Under Construction (2021)	1,500 (2.10)
10	Under Construction (2021)	1,500 (2.10)
Total Production		6,900 (9.76)

NOTES: GPM = GALLONS PER MINUTE; MGD = MILLION GALLONS PER DAY.

(A) CAPACITIES FOR WELLS 3, 4, 5, AND 8 ARE AS LISTED IN THE 1,2,3-TCP MITIGATION FEASIBILITY STUDY.

### Water Supply and Demands Assessment

For adequate water supply capacity, per DDW and industry standards, the total water production capacity should be equal to or greater than the MDD, less production from the largest well in service. This is referred to as the “firm capacity.” Table 42 lists the water production capacities under various scenarios, including a possible future scenario where Wells 3 and 4 are decommissioned.

**Table 42: Total Municipal Water Production Capacity Under Varying Scenarios**

<b>Scenario</b>	<b>Description</b>	<b>Wells Online</b>	<b>Totally Supply, mgd</b>
Total Existing Production (in full compliance with water regulations)	All existing and active wells	3, 4, 8	0
Total Existing Production of Active Wells	All existing and active wells	3, 4, 8	5.56
Existing Firm Capacity	Existing wells w/o largest well	3, 4	3.46
Total Long-Term Future	All existing wells and future wells	3, 4, 8, 9, 10	9.76
Long-Term Future Firm Capacity <sup>(1)</sup>	Existing and future treated wells w/largest producer out-of-service	3, 8, 9, 10	6.22

NOTES: MGD = MILLION GALLONS PER DAY.

(1) TREATMENT CAPACITY AT THE WELL 7 FACILITY IS LIMITED TO 3,000 GPM, THUS WELL 4 CANNOT BE USED IN THE FIRM CAPACITY CALCULATIONS.

The conveyance capacity is the sum of the capacities of the wells or stored water that pumps directly into the water distribution system, and the network of pipes that allow the water to be delivered to the City’s residents and businesses. The total conveyance capacity of the system should be equal to or greater than the MDD, plus fire flow, or the peak hour demand, whichever is greater. In this case, the City of Hughson’s fire suppression demands dictate that the former is used for calculations.

Shoreline Environmental Engineering performed an evaluation of the proposed Parkwood Subdivision water system. The purpose of the evaluation was to determine if the water distribution system proposed for the project is of sufficient capacity to provide for the project’s domestic and fire suppression demands, and other off-site demands that will rely on the project’s water system. The results of the analysis indicate that the system, as proposed, is adequately sized for the flow conditions evaluated.

### Evaluation Method and Assumptions

The Parkwood Subdivision water distribution system was evaluated using Bentley WaterCAD V8i hydraulic network software. A full model of the City’s water system, including existing and pending wells and storage, was modified for the analysis by adding the Parkwood Subdivision piping and projected demands, as provided by MVE, Inc. (*Water Study for Parkwood Single-Family*

*Residential Development*, dated January 14, 2020). In addition, distribution piping was extended from the subdivision to provide fire suppression protection to the Jehovah Witnesses Kingdom Hall Church, located at 1524 Santa Fe Avenue. It was recommended that the church be included in the demands, as the Parkwood project will unify church property with existing City development and services.

The Parkwood Subdivision's proposed water system consists of a network of 8" diameter pipes, with two (2) points-of-connection (POC) to the City's water system. The POC's include a connection to the terminus of an existing 8" diameter pipe in Flora Vista Drive, and a second to the terminus of an existing 8" diameter pipe in Estancia Drive, both north of Leaflet Lane. These connections effectively extend the City's water distribution system, relying on pressure and flow capacity from the City's existing system at said POC's. No additional pumps or supplies are proposed at these locations.

Model water demands for the project included domestic residential and fire suppression. Residential demand assumptions for the Parkwood project were based on the MVE, Inc. study, and State of California, Division of Drinking Water standards to determine maximum day demand (MDD) capacity requirements for Hughson. For the existing system, the City's permit requires the City provide and maintain capacity and conveyance for the highest demand recorded in the past 10-years. According to City operations records, the highest annual water demand occurred in 2013 (575 MG), resulting in a MDD of 3.54 MGD. With the addition of current and proposed development projects, including Parkwood, total system MDD increases to approximately 4.2 MGD. Of note, the unit water demands projected for the current and proposed projects are less than the City's existing unit demands, since these projects will be constructed using new conservation standards and codes (i.e. Green Building Code).

Model scenarios are typically performed assuming the greater of MDD with a fire suppression event, or during a peak hour demand (PHD). According to the Hughson Fire Protection District, the church requires 1,750 gpm flow for fire suppression, which is greater than the subdivision's fire demand. This demand also exceeds demands anticipated during a PHD. Thus, a MDD + fire scenario was used for modeling the system.

Two (2) scenarios were developed for different source water production conditions, included the following:

- **Scenario #1** - "*Existing System*", consisting of existing Wells 3, 4, and 8, and Fox Road 0.75MG storage/pumping facility; and
- **Scenario #2** - "*Future System with Certain Sources Temporarily Offline*", consisting of Well 8 and future Wells 9 and 10/Tully Road 1.0 MG storage/pumping, and Wells 3 and 4 temporarily offline.

These two scenarios were performed to verify (1) approval of the Parkwood project is acceptable with existing water infrastructure (i.e. project is not dependent upon future water system improvements), and (2) with operation of Wells 9 and 10/1.0 MG storage and pumping, Wells 3 and 4 can be taken out-of-service temporarily for near-term improvements, including installation of new TCP treatment equipment as currently anticipated by the City. Well 8 will need to remain in service during periods of high demand for both scenarios. Thus, Well 8 can only be removed from service to address TCP improvements during periods of low demand.

## Results

Table 43 provides a summary of results for the modeling scenarios evaluated. The pressure and flow data presented includes pipes and nodes associated with the Parkwood Subdivision.

**Table 43: Total Municipal Water Production Capacity Under Varying Scenarios**

<b>Condition</b>	<b>Scenario #1</b>	<b>Scenario #2</b>
Sources Active	W3, W4, W8, Fox Storage	W8, W9 Storage (W9/W10)
Source Production/Pressure	--	--
W3	1,140 gpm/58 psi	Offline
W4	1,160 gpm/58 psi	Offline
W8	1,500/56 psi	1,500 gpm/56 psi
W9	Offline	3,240 gpm/63 psi
Fox Road Storage	940 gpm/59 psi	Offline
Total Production	4,740 gpm	4,740 gpm
Lowest Pressure/Node	27 psi/401 (church)	32 psi/401 (church)
Highest Velocity/Pipe/Location	7.85 fps/525/Estancia Drive	7.85 fps/525/Estancia Drive
All Conditions Satisfied	Yes	No

SOURCE: SHORELINE ENVIRONMENTAL, 2020.

## Findings and Recommendations

The hydraulic model results indicate that the Parkwood Subdivision water system, as proposed by MVE, Inc., will provide adequate flow and pressure to meet the highest anticipated MDD + fire suppression condition. A Peak Hour condition was not performed since MDD + fire represents the higher demand scenario. Model results indicate that all City production facilities were within normal operational range for pressure and flow for both conditions described.

One pipe in the system exceeded 7 fps, a maximum flow rate value that the City uses for design of new piping system improvements. The purpose of using this value is to minimize headloss in any given pipe to ensure adequate pressures throughout the system. However, residual pressures at the church were sufficiently above minimum requirements (20 psi) during a fire suppression event to be of concern. A portion of the pipe with the high velocity is part of the City's existing system (#525 – Estancia Drive), so replacing the pipe with a larger diameter pipe would be costly and disruptive. Further, since the pipe length is relatively short, total headloss is minimal. Thus, it is not recommended that the pipe be replaced, nor increase the diameter of the proposed section of pipe to be installed by Parkwood.

## Project's Share of Water System Improvements and Operations & Maintenance Costs

To fund water system upgrades and ongoing operation and maintenance of existing water facilities, the City collects Development Impact Fees (DIF) and Water User Rate Fees (WURF). The DIF is a one-time fee paid for each single-family home constructed within a proposed development. The Development Impact Fees for the City are currently being updated. The project has agreed to pay the approved fee up to the currently proposed amount of \$8,119 per single family home. The WURF is a monthly fee for all existing homes. Table 44 summarizes the fee amounts that the proposed project will contribute through water fees to help finance the City's water facility improvements and operating costs.

**Table 44. Parkwood Project Water Fees**

<b>Fee</b>	<b>Fee Amount<sup>(a)</sup> (per dwelling unit)</b>	<b>Number of Units</b>	<b>Fees to be Collected</b>
DIF	Water Fee: \$8,119 Construction Water Fee: \$155	299	\$2,427,581 (one-time)
WURF	\$53/month		\$190,164 (annual)

NOTES: DIF = DEVELOPMENT IMPACT FEE; WURF = WATER USE RATE FEE.

(A) 2020 RATES.

SOURCE: SHORELINE ENVIRONMENTAL, 2020.

### Summary and Conclusion

The City of Hughson is actively working to address deficiencies in its water supply system. The City has lost three (3) of its seven (7) water supply wells to groundwater contaminants since 2013, and currently has no wells that meet all federal and state drinking water standards. Projects to address the water system deficiencies include:

- Construction of Well 8 Water Treatment Facility (2013);
- Conversion of Well 6 to a non-potable water supply (2016);
- Design and construction of the Well 7 Replacement Project (2018);
- Planned design and construction of GAC treatment facilities for treatment of 1,2,3-TCP contamination at Wells 3, 4 and 8;
- Planned construction of pipeline from Well 4 to Well 7 Replacement arsenic treatment facility.

The estimated capital cost of the treatment facilities necessary to address 1,2,3-TCP contamination is approximately \$9M.<sup>3</sup> Although the City is attempting to secure funding for 1,2,3-TCP mitigation (e.g. wellhead treatment) from multiple sources, including litigation against responsible parties, there are no agreements or guarantees that all, or any portion, of these costs will be reimbursed. Funding for said improvements may come from a combination of impact fees, water rates, and government loans or grants. All new developments are required to participate in funding these efforts. The DDW may require that a source of funding be identified for 1,2,3-TCP improvements before additional connections to the City's water system can proceed.

Other future projects to improve and expand the City's water supply will likely include a pipeline to connect Well 4 with the Well 7 Replacement facility, additional non-potable service connections, and implementing water conservation improvements in accordance with state water and building codes.

The City's current projected MDD including estimated water demands for the proposed project and development projects currently in construction or approved for development, is 4.18 mgd. For adequate and reliable water supply per DDW and industry standards, the firm water production capacity (without the largest well in service) must be greater than the MDD. Currently, the firm production is approximately 3.46 mgd.<sup>4</sup> When the construction

<sup>3</sup> City 1,2,3-TCP Mitigation Study

<sup>4</sup> Mitigation of 1,2,3-TCP is required for full compliance with state drinking water regulations.



of the Well 7 Replacement Project is completed (est. 2021) and Wells 9 and 10 are available for municipal supply, the total firm water production capacity will be roughly 6.2 mgd,

Upon completion of the Well 7 Replacement Project, the City's water supply capacity is expected to be adequate to meet the City's projected water demands at the buildout of the project. This conclusion is based on the following assumptions:

- The City will address arsenic and 1,2,3-TCP water quality issues, so that the City's active water supply wells are in compliance with federal and state drinking water codes;
- The well supply capacities will not be impacted by the state's groundwater sustainability laws and local basin mitigation plans;
- The well supply capacities in single dry and multiple drought years are the same as in normal years.

Future developments will require the City to identify or develop additional water supplies.

The project applicant would be required to pay water system impact fees to the City totaling \$2,427,581. At buildout, the subdivision will contribute \$190,164 annually in water rates. These fees can be used to partially offset capital costs of the City's planned water system improvements and ongoing operation and maintenance of the water facilities.

The proposed project would not result in insufficient water supplies available to serve the project from existing entitlements and resources. Therefore, a ***less than significant*** impact would occur related to water supply and water infrastructure.

## Wastewater

The City of Hughson provides wastewater collection and treatment for the incorporated city and operates a wastewater treatment plant on the northern edge of the city, between Hatch Road and the Tuolumne River. The existing plant includes a series of 10 evaporation and percolation ponds, one of which is used for emergency storage. Pond usage fluctuates according to flows.

All new development within the city is required to connect to the wastewater collection system, and septic systems are prohibited.

According to the 2003 Wastewater Master Plan, the facility has an existing design capacity for dry weather flows of 800,000 gpd and up to 2.33 mgd for peak wet weather flows. The treatment plant estimated the average flow is currently 0.6 mgd gpd (as of June 2019). The plant's permitted capacity is the same as its design capacity.

The City's most recent (2007) Wastewater Treatment Master Plan looked at future wastewater treatment demand scenarios for 2005, 2010, 2015, 2020, 2025, and 2030. The City of Hughson Municipal Service Review (2004) projects significant growth to a population of 15,074 in 2025, with annual growth at 7.7 percent. Similar to the Urban Water Management Plan, the Wastewater Treatment Master Plan uses this population projection to forecast the population and associated water demand for year 2030. According to the 2019 Department of Finance population estimates, the population in Hughson is 8,017 people. Therefore, the actual population growth in the City has been well below what was projected in the Wastewater Treatment Master Plan. The Wastewater Treatment Master Plan shows that the City has adequate wastewater treatment capacity to meet projected demands in 2030.

Using the medium density residential water demand factor in the City's most recent Wastewater Treatment Master Plan (2007) of 1,400 gpd per acre, the 56.04 acres of medium density residential uses would generate 78,456 gpd of wastewater, or 28.6 million gallons per year.

As noted above, the City's General Plan and associated EIR anticipated up to 382 residential units (96 within the LDR area and 248 within the MDR area) and up to 413,820 square feet of commercial uses within the project site. The analysis included in the City's Wastewater Treatment Master Plan assumed that the site would be developed with LDR, MDR, and SC uses. The project would not increase demand beyond the levels assumed for the site in the City's Wastewater Treatment Master Plan.

Because adequate long-term wastewater treatment capacity is available to serve full build-out of the project, a ***less than significant*** impact would occur related to requiring or resulting in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

**Responses d), e):** Solid waste hauling service for the City of Hughson is provided by Gilton Resource Recovery and would serve the proposed project. Garbage is transported first to a transfer station in Modesto, where it is sorted to remove items that can be recycled. About 60 percent of the remaining waste that cannot be recycled is then sent to the County's Fink Road landfill, located in Crow's Landing. The other 40 percent is split between various facilities located both in and outside of the County. Residents may also drop off large amounts of garbage or debris in person at the landfill for a charge.

Approximately 70 percent of the total garbage received at the Fink Road landfill is processed at the on-site cogeneration plant, which is a waste-to-energy plant run by Covanta Energy. The remaining 30 percent, an average of 300 to 400 tons per day, is deposited in the landfill, with an additional 300 tons of ash generated by the waste-to-energy plant. The landfill has a permitted capacity until December 2023. In order to accommodate waste after 2023, the Fink Road landfill is currently undergoing a permitting process with the County to expand its site westward on a portion of the 2,700 acres owned by the County. A recycling center would be included in this expansion to further reduce the amount of landfilled waste. The landfill is currently permitted to accept up to 2,400 tons per day.

Solid waste generated by the proposed project was estimated based on CalRecycle generation rate estimates for residential uses. The residential uses are estimated to generate roughly 12.23 pounds per day per household. It is estimated that the proposed 299 residential units would generate 3,656.8 pounds per day (1.8 tons per day) of solid waste.

Development of the site for urban uses was assumed in the City's General Plan EIR, and the actual population growth in the City has been well below what was projected in the General Plan EIR. The project would result in development of the site with fewer units than was anticipated by the General Plan EIR. The project would not interfere with regulations related to solid waste, or generate waste in excess of the capacity of local infrastructure. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**XX. WILDFIRE**

<b>Would the project:</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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?			X	
d) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
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?			X	
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?			X	

**Existing Setting**

There are no State Responsibility Areas (SRAs) within the vicinity of the Hughson Planning Area. The City of Hughson is not categorized as a "Very High" FHSZ by CalFire. Although this CEQA topic only applies to areas within a SRA or Very High FHSZ, out of an abundance of caution, these checklist questions are analyzed below.

**Responses to Checklist Questions**

**Response a)** The project site will connect to an existing network of City streets. The proposed circulation improvements would allow for greater emergency access relative to existing conditions. The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, impacts from project implementation would be considered **less than significant** relative to this topic.

**Response b)** The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point. The project site is located in an area that is predominately agricultural and urban, which is not considered at a significant risk of wildlife. Therefore, impacts from project implementation would be considered **less than significant** relative to this topic.

**Response c)** The project includes development of infrastructure (water, sewer, and storm drainage) required to support the proposed multi-family use. The project site is surrounded by existing and future urban development. The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The project would not require the installation or maintenance of infrastructure that may exacerbate fire risk. Therefore, impacts from project implementation would be considered ***less than significant*** relative to this topic.

**Response d)** The proposed project would require the installation of storm drainage infrastructure to ensure that storm waters properly drain from the project site and does not result in downstream flooding or major drainage changes. The proposed storm drainage plan includes an engineered network of storm drain lines and retention basins. The project proposes to include two park/dual use drainage basins: one in the eastern portion of the subdivision (1.33 acres), and one in the western portion of the subdivision (3.20 acres). The storm drainage plan was designed and engineered to ensure proper construction of storm drainage infrastructure to control runoff and prevent flooding, erosion, and sedimentation.

Runoff from the project site currently flows to the existing City storm drains located in the project vicinity. Upon development of the site, stormwater would flow to the on-site retention basins and/or the existing storm drains in the adjacent roadways (including Santa Fe Avenue and Hatch Road). Additionally, the project site is located within FEMA Zone X (un-shaded), indicating that the site is located outside of the 100-year flood hazard zone. Further, because the site is essentially flat and located in an existing urbanized area of the City, downstream landslides would not occur.

Landslides include rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. One of the most common causes of landslides is construction activity that is associated with road building (i.e. cut and fill). The project site is relatively flat; therefore, the potential for a landslide in the project site is essentially non-existent.

Overall, impacts from project implementation would be considered ***less than significant*** relative to this topic.

**XXI. MANDATORY FINDINGS OF SIGNIFICANCE**

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

**Responses to Checklist Questions**

**Response a):** This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, wildfire, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. This includes the potential for the proposed project to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, 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. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. For the reasons presented throughout this Initial Study, 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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. With the implementation of mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials,

hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, wildfire, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. These mitigation measures would also function to reduce the project's contribution to cumulative impacts.

The project would increase the population and use of public services and utility systems; however, it was found that there is adequate capacity to accommodate the project.

There are no significant cumulative or cumulatively considerable effects that are identified associated with the proposed project after the implementation of all mitigation measures presented in this Initial Study. With the implementation of all mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

**Response c):** The construction phase could affect surrounding neighbors through increased air emissions, noise, and traffic; however, the construction effects are temporary and are not substantial. The operational phase could also affect surrounding neighbors through increased air emissions, noise, and traffic; however, mitigation measures have been incorporated into the proposed project that would reduce the impacts to a less than significant level. The proposed project would not cause substantial adverse effects on human beings. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.



## REFERENCES

- California Air Resources Board. ARB Databases: Aerometric Data Analysis and Management System (ADAM). 2016. Available at: <<http://www.arb.ca.gov/html/databases.htm>>.
- California Air Resources Board. EMFAC2014 (v1.0.7) Emissions Inventory, Stanislaus County, 2021. Available at: <<https://www.arb.ca.gov/emfac/2014/>>.
- California Air Resources Board. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October 2000. Available at: <<https://www.arb.ca.gov/diesel/documents/rrpFinal.pdf>>.
- California Air Pollution Control Officers Association. California Emissions Estimator Model User's Guide, Version 2013.2.
- California Air Pollution Control Officers Association. Quantifying Greenhouse Gas Mitigation Measures. August 2010.
- California Department of Conservation. California Important Farmland Finder. 2016. Available at: <<http://maps.conservation.ca.gov/ciff/ciff.html>>.
- California Department of Conservation. California Land Conservation Act 2014 Status Report, The Williamson Act. March 2015.
- California Department of Fish and Game. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. 2009.
- California Department of Fish and Wildlife. "Special Animals List." Natural Diversity Database. 2019.
- California Department of Fish and Wildlife. "State and Federally Listed Endangered, Threatened, and Rare Plants of California." 2019.
- California Department of Fish and Wildlife. "State and Federally Listed Endangered, Threatened, and Rare Animals of California." 2019.
- California Department of Fish and Wildlife. California Natural Diversity Database (CNDDB). 2019.
- California Department of Resources Recycled and Recovery. Estimated Solid Waste Generation Rates. 2019. Available at: <<https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates>>.
- California Department of Resources Recycled and Recovery. SWIS Facility Detail – Fink Road Landfill (50-AA-0001). 2019. Available at: <<https://www2.calrecycle.ca.gov/SWFacilities/Directory/50-AA-0001/Detail/>>.
- California Energy Commission. Global Climate Change: In Support of the 2005 Integrated Energy Policy Report (CEC-600-2005-007). 2005. Available at: <<http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF>>.

California Energy Commission. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004 (CEC-600-2006-013-SF). 2006. Available at: <<http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>>.

City of Hughson. City of Hughson 2005 Urban Water Management Plan. November 2006.

City of Hughson. City of Hughson Wastewater Treatment Plant Master Plan. June 2007.

City of Hughson. Climate Action Plan. December 9, 2013.

City of Hughson. Hughson 2005 General Plan EIR. June 30, 2005.

City of Hughson. Hughson General Plan. December 12, 2005.

City of Hughson. Hughson Municipal Code. Current through Ordinance 2019-03, passed March 25, 2019.

Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: The Physical Science Basis, Summary for Policy Makers. Available at: <[http://fire.pppl.gov/ipcc\\_summary\\_020207.pdf](http://fire.pppl.gov/ipcc_summary_020207.pdf)>.

KD Anderson & Associates. Traffic Impact Analysis for Parkwood Subdivision GPA, Hughson, CA. June 28, 2019.

Peak & Associates, Inc. Cultural Resource Assessment for the Parkwood Subdivision Project, City of Hughson, Stanislaus County, California. May 6, 2019.

Personal communication with Lea Simvoulakis, Community Development Director, City of Hughson. June 19, 2019.

Personal communication with Lea Simvoulakis, Community Development Director, City of Hughson. June 21, 2019.

Saxelby Acoustics LLC. Environmental Noise Assessment – Parkwood Residential, City of Hughson, California. April 7, 2020.

San Joaquin Council of Governments. Airport Land Use Compatibility Plan Update – San Joaquin County Aviation System, San Joaquin County, California. July 2009.

San Joaquin Council of Governments. Airport Land Use Compatibility Plan Update for Stockton Metropolitan Airport. May 2016.

San Joaquin Council of Governments. Regional Transportation Plan / Sustainable Communities Strategy. June 2018.

San Joaquin County Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015.

Shoreline Environmental. Technical Memorandum – Subject: Parkwood Subdivision Project, Water System Analysis, Summary of Results and Recommendations. June 2, 2020.

Skinner, Mark W. and Bruce M. Pavlik, Eds. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. 2001.

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West Yost Associates. Evaluation of Water Supply Plan for the Parkwood Subdivision Project in the City of Hughson. February 25, 2020.

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# **Appendix A**

**Air Quality, Greenhouse Gas, and Energy Modeling**

## PARKWOOD SUBDIVISION CalEEMod Assumptions

### PROJECT CHARACTERISTICS TAB:

*Project Location – Air District:* San Joaquin Valley Air Pollution Control District

*CEC Forecasting Climate Zone:* 3

*Land Use Setting:* Urban

*Start of Construction:* Monday, February 10, 2020

*Operational Year:* 2021

*Utility Company:* PG&E

*CO<sub>2</sub> Intensity Factor:* 290 lbs/MWh

- Note: Updated PG&E emission factor for 2020 reflecting RPS reductions per PG&E's *Greenhouse Gas Emission Factors: Guidance for PG&E Customers* (November 2015). Available: <[https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge\\_ghg\\_emission\\_factor\\_info\\_sheet.pdf](https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf)>.

### LAND USE TAB:

LAND USE TYPE AND SUBTYPE	UNIT AMOUNT AND METRIC <sup>1</sup>	ACREAGE <sup>1</sup>	SQUARE FOOTAGE	POPULATION <sup>2</sup>
Residential – Single Family Housing	299 DU	56.04	--	1,034
<sup>1</sup> SOURCE: DASCOR DEVELOPMENT, 2019.				
<sup>2</sup> ACCORDING TO THE MOST RECENT DEPARTMENT OF FINANCE (2019) ESTIMATES, THE AVERAGE NUMBER OF PERSONS RESIDING IN A DWELLING UNIT IN THE CITY OF HUGHSON IS 3.46.				

### CONSTRUCTION TAB – PHASING: CalEEMod Defaults

PHASE #	PHASE NAME	START DATE	END DATE	# DAYS/WEEK	# DAYS
1	Site Preparation	5/16/2020	7/10/2020	5	40
2	Grading	7/11/2020	12/11/2020	5	110
3	Building Construction	12/12/2020	3/14/2025	5	1,110
4	Paving	3/15/2025	6/27/2025	5	75
5	Architectural Coating	6/28/2025	10/10/2025	5	75

### CONSTRUCTION TAB – OFF-ROAD EQUIPMENT: CalEEMod Defaults

*OPERATIONAL TAB – MOBILE:* Per the project-specific traffic study (KD Anderson & Associates, Inc., 2019), the project would generate 9.44 daily trips per dwelling unit.



*MITIGATION TAB:*

*Traffic:*

- Project Setting: Low Density Suburban
- Increase Density: 299 du/56.04 ac = 5.34 du/ac
- Increase Destination Accessibility: Distance to Downtown/Job Center is 0.95 miles (from project site to downtown Hughson)
- Increase Transit Accessibility: Distance to Transit is 0.78 miles (StaRT Stop 110 at 3<sup>rd</sup> and Hughson)
- Improve Pedestrian Network: Project Site and Connecting Off-Site (project includes connections from the site to the adjacent residential subdivisions to the south and a multi-use path along the TID canal)

*Area:*

- Only Natural Gas Hearth
  - Per SJVAPCD Rule 4901: Wood-Burning Fireplaces and Wood-Burning Heaters, open-hearth fireplaces are not allowed in new construction projects which would result in more than two homes per acre. The proposed project includes more than two homes per acre.

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**Parkwood Subdivision**  
**San Joaquin Valley Unified APCD Air District, Annual**

**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	299.00	Dwelling Unit	56.04	538,200.00	1034

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.7	<b>Precipitation Freq (Days)</b>	45
<b>Climate Zone</b>	3			<b>Operational Year</b>	2021
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MW hr)</b>	290	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics - See Appenedix A for Assumptions

Land Use - See Appenedix A for Assumptions

Construction Phase -

Energy Use -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation - See CalEEMod Assumptions

Vehicle Trips - See CalEEMod Assumptions

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblLandUse	LotAcreage	97.08	56.04
tblLandUse	Population	948.00	1,034.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	ST_TR	9.91	9.44
tblVehicleTrips	SU_TR	8.62	9.44
tblVehicleTrips	WD_TR	9.52	9.44
tblWoodstoves	NumberCatalytic	56.04	0.00
tblWoodstoves	NumberNoncatalytic	56.04	0.00

## 2.0 Emissions Summary

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## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, 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	0.3514	3.7771	2.3757	4.6000e-003	0.8576	0.1716	1.0292	0.4016	0.1580	0.5596	0.0000	404.6955	404.6955	0.1234	0.0000	407.7812
2021	0.3164	2.7713	2.6198	5.7700e-003	0.1404	0.1272	0.2675	0.0380	0.1196	0.1575	0.0000	511.6670	511.6670	0.0840	0.0000	513.7680
2022	0.2849	2.4965	2.5428	5.7000e-003	0.1398	0.1070	0.2469	0.0378	0.1007	0.1385	0.0000	505.3106	505.3106	0.0827	0.0000	507.3770
2023	0.2601	2.2342	2.4838	5.6300e-003	0.1398	0.0920	0.2319	0.0378	0.0866	0.1244	0.0000	499.2349	499.2349	0.0794	0.0000	501.2188
2024	0.2455	2.1225	2.4651	5.6300e-003	0.1409	0.0814	0.2223	0.0381	0.0766	0.1146	0.0000	498.8538	498.8538	0.0794	0.0000	500.8394
2025	5.1426	0.7695	1.1317	2.1900e-003	0.0396	0.0319	0.0715	0.0107	0.0298	0.0404	0.0000	192.9724	192.9724	0.0409	0.0000	193.9957
Maximum	5.1426	3.7771	2.6198	5.7700e-003	0.8576	0.1716	1.0292	0.4016	0.1580	0.5596	0.0000	511.6670	511.6670	0.1234	0.0000	513.7680

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**2.1 Overall Construction****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	0.3514	3.7771	2.3757	4.6000e-003	0.8576	0.1716	1.0292	0.4016	0.1580	0.5596	0.0000	404.6950	404.6950	0.1234	0.0000	407.7808
2021	0.3164	2.7713	2.6198	5.7700e-003	0.1404	0.1272	0.2675	0.0380	0.1196	0.1575	0.0000	511.6666	511.6666	0.0840	0.0000	513.7676
2022	0.2849	2.4965	2.5428	5.7000e-003	0.1398	0.1070	0.2469	0.0378	0.1007	0.1385	0.0000	505.3103	505.3103	0.0827	0.0000	507.3766
2023	0.2601	2.2342	2.4838	5.6300e-003	0.1398	0.0920	0.2319	0.0378	0.0866	0.1244	0.0000	499.2345	499.2345	0.0794	0.0000	501.2184
2024	0.2455	2.1225	2.4651	5.6300e-003	0.1409	0.0814	0.2223	0.0381	0.0766	0.1146	0.0000	498.8534	498.8534	0.0794	0.0000	500.8390
2025	5.1426	0.7695	1.1317	2.1900e-003	0.0396	0.0319	0.0715	0.0107	0.0298	0.0404	0.0000	192.9722	192.9722	0.0409	0.0000	193.9955
Maximum	5.1426	3.7771	2.6198	5.7700e-003	0.8576	0.1716	1.0292	0.4016	0.1580	0.5596	0.0000	511.6666	511.6666	0.1234	0.0000	513.7676

	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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	5-10-2020	8-9-2020	1.5197	1.5197
3	8-10-2020	11-9-2020	1.8005	1.8005
4	11-10-2020	2-9-2021	1.1518	1.1518
5	2-10-2021	5-9-2021	0.7528	0.7528
6	5-10-2021	8-9-2021	0.7771	0.7771

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

7	8-10-2021	11-9-2021	0.7779	0.7779
8	11-10-2021	2-9-2022	0.7465	0.7465
9	2-10-2022	5-9-2022	0.6807	0.6807
10	5-10-2022	8-9-2022	0.7028	0.7028
11	8-10-2022	11-9-2022	0.7035	0.7035
12	11-10-2022	2-9-2023	0.6728	0.6728
13	2-10-2023	5-9-2023	0.6107	0.6107
14	5-10-2023	8-9-2023	0.6307	0.6307
15	8-10-2023	11-9-2023	0.6311	0.6311
16	11-10-2023	2-9-2024	0.6158	0.6158
17	2-10-2024	5-9-2024	0.5818	0.5818
18	5-10-2024	8-9-2024	0.5942	0.5942
19	8-10-2024	11-9-2024	0.5946	0.5946
20	11-10-2024	2-9-2025	0.5787	0.5787
21	2-10-2025	5-9-2025	0.3914	0.3914
22	5-10-2025	8-9-2025	2.2580	2.2580
23	8-10-2025	9-30-2025	2.5281	2.5281
		Highest	2.5281	2.5281



## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**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	2.6876	0.1375	2.2725	8.3000e-004		0.0213	0.0213		0.0213	0.0213	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131
Energy	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	761.7363	761.7363	0.0425	0.0148	767.2012
Mobile	1.0640	11.4878	11.0549	0.0521	3.1194	0.0478	3.1673	0.8391	0.0452	0.8843	0.0000	4,833.9062	4,833.9062	0.3204	0.0000	4,841.9168
Waste						0.0000	0.0000		0.0000	0.0000	78.9716	0.0000	78.9716	4.6671	0.0000	195.6488
Water						0.0000	0.0000		0.0000	0.0000	6.1804	19.5205	25.7009	0.6367	0.0154	46.2065
<b>Total</b>	<b>3.7937</b>	<b>11.9855</b>	<b>13.4807</b>	<b>0.0552</b>	<b>3.1194</b>	<b>0.0983</b>	<b>3.2177</b>	<b>0.8391</b>	<b>0.0956</b>	<b>0.9347</b>	<b>85.1520</b>	<b>5,748.3185</b>	<b>5,833.4705</b>	<b>5.6727</b>	<b>0.0325</b>	<b>5,984.9863</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, 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	2.6876	0.1375	2.2725	8.3000e-004		0.0213	0.0213		0.0213	0.0213	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131
Energy	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	755.1243	755.1243	0.0418	0.0146	760.5319
Mobile	1.0339	11.1213	10.4766	0.0490	2.9042	0.0449	2.9491	0.7812	0.0424	0.8236	0.0000	4,551.3880	4,551.3880	0.3134	0.0000	4,559.2232
Waste						0.0000	0.0000		0.0000	0.0000	78.9716	0.0000	78.9716	4.6671	0.0000	195.6488
Water						0.0000	0.0000		0.0000	0.0000	6.1804	19.5205	25.7009	0.6367	0.0154	46.2065
<b>Total</b>	<b>3.7636</b>	<b>11.6190</b>	<b>12.9024</b>	<b>0.0522</b>	<b>2.9042</b>	<b>0.0954</b>	<b>2.9996</b>	<b>0.7812</b>	<b>0.0929</b>	<b>0.8741</b>	<b>85.1520</b>	<b>5,459.1882</b>	<b>5,544.3403</b>	<b>5.6650</b>	<b>0.0324</b>	<b>5,695.6235</b>

	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
<b>Percent Reduction</b>	<b>0.79</b>	<b>3.06</b>	<b>4.29</b>	<b>5.53</b>	<b>6.90</b>	<b>2.96</b>	<b>6.78</b>	<b>6.90</b>	<b>2.88</b>	<b>6.49</b>	<b>0.00</b>	<b>5.03</b>	<b>4.96</b>	<b>0.14</b>	<b>0.43</b>	<b>4.83</b>

**3.0 Construction Detail****Construction Phase**

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/16/2020	7/10/2020	5	40	
2	Grading	Grading	7/11/2020	12/11/2020	5	110	
3	Building Construction	Building Construction	12/12/2020	3/14/2025	5	1110	
4	Paving	Paving	3/15/2025	6/27/2025	5	75	
5	Architectural Coating	Architectural Coating	6/28/2025	10/10/2025	5	75	

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 275**

**Acres of Paving: 0**

**Residential Indoor: 1,089,855; Residential Outdoor: 363,285; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, 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	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	108.00	32.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.1 Mitigation Measures Construction****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					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0815	0.8484	0.4303	7.6000e-004		0.0440	0.0440		0.0404	0.0404	0.0000	66.8614	66.8614	0.0216	0.0000	67.4020
<b>Total</b>	<b>0.0815</b>	<b>0.8484</b>	<b>0.4303</b>	<b>7.6000e-004</b>	<b>0.3613</b>	<b>0.0440</b>	<b>0.4053</b>	<b>0.1986</b>	<b>0.0404</b>	<b>0.2390</b>	<b>0.0000</b>	<b>66.8614</b>	<b>66.8614</b>	<b>0.0216</b>	<b>0.0000</b>	<b>67.4020</b>

**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	1.5200e-003	1.0300e-003	0.0105	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.5846	2.5846	7.0000e-005	0.0000	2.5864
<b>Total</b>	<b>1.5200e-003</b>	<b>1.0300e-003</b>	<b>0.0105</b>	<b>3.0000e-005</b>	<b>2.8800e-003</b>	<b>2.0000e-005</b>	<b>2.9000e-003</b>	<b>7.6000e-004</b>	<b>2.0000e-005</b>	<b>7.8000e-004</b>	<b>0.0000</b>	<b>2.5846</b>	<b>2.5846</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>2.5864</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.2 Site Preparation - 2020****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					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0815	0.8484	0.4303	7.6000e-004		0.0440	0.0440		0.0404	0.0404	0.0000	66.8613	66.8613	0.0216	0.0000	67.4019
<b>Total</b>	<b>0.0815</b>	<b>0.8484</b>	<b>0.4303</b>	<b>7.6000e-004</b>	<b>0.3613</b>	<b>0.0440</b>	<b>0.4053</b>	<b>0.1986</b>	<b>0.0404</b>	<b>0.2390</b>	<b>0.0000</b>	<b>66.8613</b>	<b>66.8613</b>	<b>0.0216</b>	<b>0.0000</b>	<b>67.4019</b>

**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	1.5200e-003	1.0300e-003	0.0105	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.5846	2.5846	7.0000e-005	0.0000	2.5864
<b>Total</b>	<b>1.5200e-003</b>	<b>1.0300e-003</b>	<b>0.0105</b>	<b>3.0000e-005</b>	<b>2.8800e-003</b>	<b>2.0000e-005</b>	<b>2.9000e-003</b>	<b>7.6000e-004</b>	<b>2.0000e-005</b>	<b>7.8000e-004</b>	<b>0.0000</b>	<b>2.5846</b>	<b>2.5846</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>2.5864</b>



## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**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					0.4770	0.0000	0.4770	0.1978	0.0000	0.1978	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2448	2.7609	1.7577	3.4100e-003		0.1196	0.1196		0.1100	0.1100	0.0000	299.6636	299.6636	0.0969	0.0000	302.0865
<b>Total</b>	<b>0.2448</b>	<b>2.7609</b>	<b>1.7577</b>	<b>3.4100e-003</b>	<b>0.4770</b>	<b>0.1196</b>	<b>0.5966</b>	<b>0.1978</b>	<b>0.1100</b>	<b>0.3078</b>	<b>0.0000</b>	<b>299.6636</b>	<b>299.6636</b>	<b>0.0969</b>	<b>0.0000</b>	<b>302.0865</b>

**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	4.6500e-003	3.1600e-003	0.0321	9.0000e-005	8.7900e-003	6.0000e-005	8.8600e-003	2.3400e-003	6.0000e-005	2.4000e-003	0.0000	7.8972	7.8972	2.3000e-004	0.0000	7.9029
<b>Total</b>	<b>4.6500e-003</b>	<b>3.1600e-003</b>	<b>0.0321</b>	<b>9.0000e-005</b>	<b>8.7900e-003</b>	<b>6.0000e-005</b>	<b>8.8600e-003</b>	<b>2.3400e-003</b>	<b>6.0000e-005</b>	<b>2.4000e-003</b>	<b>0.0000</b>	<b>7.8972</b>	<b>7.8972</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>7.9029</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.3 Grading - 2020****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					0.4770	0.0000	0.4770	0.1978	0.0000	0.1978	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2448	2.7609	1.7577	3.4100e-003		0.1196	0.1196		0.1100	0.1100	0.0000	299.6633	299.6633	0.0969	0.0000	302.0862
<b>Total</b>	<b>0.2448</b>	<b>2.7609</b>	<b>1.7577</b>	<b>3.4100e-003</b>	<b>0.4770</b>	<b>0.1196</b>	<b>0.5966</b>	<b>0.1978</b>	<b>0.1100</b>	<b>0.3078</b>	<b>0.0000</b>	<b>299.6633</b>	<b>299.6633</b>	<b>0.0969</b>	<b>0.0000</b>	<b>302.0862</b>

**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	4.6500e-003	3.1600e-003	0.0321	9.0000e-005	8.7900e-003	6.0000e-005	8.8600e-003	2.3400e-003	6.0000e-005	2.4000e-003	0.0000	7.8972	7.8972	2.3000e-004	0.0000	7.9029
<b>Total</b>	<b>4.6500e-003</b>	<b>3.1600e-003</b>	<b>0.0321</b>	<b>9.0000e-005</b>	<b>8.7900e-003</b>	<b>6.0000e-005</b>	<b>8.8600e-003</b>	<b>2.3400e-003</b>	<b>6.0000e-005</b>	<b>2.4000e-003</b>	<b>0.0000</b>	<b>7.8972</b>	<b>7.8972</b>	<b>2.3000e-004</b>	<b>0.0000</b>	<b>7.9029</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**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	0.0148	0.1343	0.1179	1.9000e-004		7.8200e-003	7.8200e-003		7.3500e-003	7.3500e-003	0.0000	16.2127	16.2127	3.9600e-003	0.0000	16.3116
<b>Total</b>	<b>0.0148</b>	<b>0.1343</b>	<b>0.1179</b>	<b>1.9000e-004</b>		<b>7.8200e-003</b>	<b>7.8200e-003</b>		<b>7.3500e-003</b>	<b>7.3500e-003</b>	<b>0.0000</b>	<b>16.2127</b>	<b>16.2127</b>	<b>3.9600e-003</b>	<b>0.0000</b>	<b>16.3116</b>

**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	8.9000e-004	0.0273	5.1700e-003	6.0000e-005	1.4800e-003	1.5000e-004	1.6400e-003	4.3000e-004	1.4000e-004	5.7000e-004	0.0000	6.0484	6.0484	4.8000e-004	0.0000	6.0604
Worker	3.2000e-003	2.1700e-003	0.0220	6.0000e-005	6.0400e-003	4.0000e-005	6.0900e-003	1.6100e-003	4.0000e-005	1.6500e-003	0.0000	5.4276	5.4276	1.6000e-004	0.0000	5.4314
<b>Total</b>	<b>4.0900e-003</b>	<b>0.0294</b>	<b>0.0272</b>	<b>1.2000e-004</b>	<b>7.5200e-003</b>	<b>1.9000e-004</b>	<b>7.7300e-003</b>	<b>2.0400e-003</b>	<b>1.8000e-004</b>	<b>2.2200e-003</b>	<b>0.0000</b>	<b>11.4760</b>	<b>11.4760</b>	<b>6.4000e-004</b>	<b>0.0000</b>	<b>11.4918</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2020****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	0.0148	0.1343	0.1179	1.9000e-004		7.8200e-003	7.8200e-003		7.3500e-003	7.3500e-003	0.0000	16.2127	16.2127	3.9600e-003	0.0000	16.3116
<b>Total</b>	<b>0.0148</b>	<b>0.1343</b>	<b>0.1179</b>	<b>1.9000e-004</b>		<b>7.8200e-003</b>	<b>7.8200e-003</b>		<b>7.3500e-003</b>	<b>7.3500e-003</b>	<b>0.0000</b>	<b>16.2127</b>	<b>16.2127</b>	<b>3.9600e-003</b>	<b>0.0000</b>	<b>16.3116</b>

**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	8.9000e-004	0.0273	5.1700e-003	6.0000e-005	1.4800e-003	1.5000e-004	1.6400e-003	4.3000e-004	1.4000e-004	5.7000e-004	0.0000	6.0484	6.0484	4.8000e-004	0.0000	6.0604
Worker	3.2000e-003	2.1700e-003	0.0220	6.0000e-005	6.0400e-003	4.0000e-005	6.0900e-003	1.6100e-003	4.0000e-005	1.6500e-003	0.0000	5.4276	5.4276	1.6000e-004	0.0000	5.4314
<b>Total</b>	<b>4.0900e-003</b>	<b>0.0294</b>	<b>0.0272</b>	<b>1.2000e-004</b>	<b>7.5200e-003</b>	<b>1.9000e-004</b>	<b>7.7300e-003</b>	<b>2.0400e-003</b>	<b>1.8000e-004</b>	<b>2.2200e-003</b>	<b>0.0000</b>	<b>11.4760</b>	<b>11.4760</b>	<b>6.4000e-004</b>	<b>0.0000</b>	<b>11.4918</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**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	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
<b>Total</b>	<b>0.2481</b>	<b>2.2749</b>	<b>2.1631</b>	<b>3.5100e-003</b>		<b>0.1251</b>	<b>0.1251</b>		<b>0.1176</b>	<b>0.1176</b>	<b>0.0000</b>	<b>302.2867</b>	<b>302.2867</b>	<b>0.0729</b>	<b>0.0000</b>	<b>304.1099</b>

**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	0.0135	0.4604	0.0840	1.1800e-003	0.0277	1.3000e-003	0.0290	8.0000e-003	1.2400e-003	9.2400e-003	0.0000	111.7126	111.7126	8.5300e-003	0.0000	111.9259
Worker	0.0549	0.0360	0.3728	1.0800e-003	0.1127	7.8000e-004	0.1135	0.0300	7.1000e-004	0.0307	0.0000	97.6677	97.6677	2.5800e-003	0.0000	97.7322
<b>Total</b>	<b>0.0683</b>	<b>0.4964</b>	<b>0.4568</b>	<b>2.2600e-003</b>	<b>0.1404</b>	<b>2.0800e-003</b>	<b>0.1424</b>	<b>0.0380</b>	<b>1.9500e-003</b>	<b>0.0399</b>	<b>0.0000</b>	<b>209.3804</b>	<b>209.3804</b>	<b>0.0111</b>	<b>0.0000</b>	<b>209.6581</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2021****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	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
<b>Total</b>	<b>0.2481</b>	<b>2.2749</b>	<b>2.1631</b>	<b>3.5100e-003</b>		<b>0.1251</b>	<b>0.1251</b>		<b>0.1176</b>	<b>0.1176</b>	<b>0.0000</b>	<b>302.2863</b>	<b>302.2863</b>	<b>0.0729</b>	<b>0.0000</b>	<b>304.1095</b>

**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	0.0135	0.4604	0.0840	1.1800e-003	0.0277	1.3000e-003	0.0290	8.0000e-003	1.2400e-003	9.2400e-003	0.0000	111.7126	111.7126	8.5300e-003	0.0000	111.9259
Worker	0.0549	0.0360	0.3728	1.0800e-003	0.1127	7.8000e-004	0.1135	0.0300	7.1000e-004	0.0307	0.0000	97.6677	97.6677	2.5800e-003	0.0000	97.7322
<b>Total</b>	<b>0.0683</b>	<b>0.4964</b>	<b>0.4568</b>	<b>2.2600e-003</b>	<b>0.1404</b>	<b>2.0800e-003</b>	<b>0.1424</b>	<b>0.0380</b>	<b>1.9500e-003</b>	<b>0.0399</b>	<b>0.0000</b>	<b>209.3804</b>	<b>209.3804</b>	<b>0.0111</b>	<b>0.0000</b>	<b>209.6581</b>



## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2022****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	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
<b>Total</b>	<b>0.2218</b>	<b>2.0300</b>	<b>2.1272</b>	<b>3.5000e-003</b>		<b>0.1052</b>	<b>0.1052</b>		<b>0.0990</b>	<b>0.0990</b>	<b>0.0000</b>	<b>301.2428</b>	<b>301.2428</b>	<b>0.0722</b>	<b>0.0000</b>	<b>303.0471</b>

**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	0.0125	0.4345	0.0772	1.1600e-003	0.0276	1.1200e-003	0.0287	7.9700e-003	1.0700e-003	9.0400e-003	0.0000	110.2512	110.2512	8.1900e-003	0.0000	110.4560
Worker	0.0506	0.0320	0.3384	1.0400e-003	0.1123	7.5000e-004	0.1130	0.0298	6.9000e-004	0.0305	0.0000	93.8166	93.8166	2.2900e-003	0.0000	93.8740
<b>Total</b>	<b>0.0631</b>	<b>0.4665</b>	<b>0.4156</b>	<b>2.2000e-003</b>	<b>0.1398</b>	<b>1.8700e-003</b>	<b>0.1417</b>	<b>0.0378</b>	<b>1.7600e-003</b>	<b>0.0396</b>	<b>0.0000</b>	<b>204.0678</b>	<b>204.0678</b>	<b>0.0105</b>	<b>0.0000</b>	<b>204.3300</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2022****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	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
<b>Total</b>	<b>0.2218</b>	<b>2.0300</b>	<b>2.1272</b>	<b>3.5000e-003</b>		<b>0.1052</b>	<b>0.1052</b>		<b>0.0990</b>	<b>0.0990</b>	<b>0.0000</b>	<b>301.2425</b>	<b>301.2425</b>	<b>0.0722</b>	<b>0.0000</b>	<b>303.0467</b>

**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	0.0125	0.4345	0.0772	1.1600e-003	0.0276	1.1200e-003	0.0287	7.9700e-003	1.0700e-003	9.0400e-003	0.0000	110.2512	110.2512	8.1900e-003	0.0000	110.4560
Worker	0.0506	0.0320	0.3384	1.0400e-003	0.1123	7.5000e-004	0.1130	0.0298	6.9000e-004	0.0305	0.0000	93.8166	93.8166	2.2900e-003	0.0000	93.8740
<b>Total</b>	<b>0.0631</b>	<b>0.4665</b>	<b>0.4156</b>	<b>2.2000e-003</b>	<b>0.1398</b>	<b>1.8700e-003</b>	<b>0.1417</b>	<b>0.0378</b>	<b>1.7600e-003</b>	<b>0.0396</b>	<b>0.0000</b>	<b>204.0678</b>	<b>204.0678</b>	<b>0.0105</b>	<b>0.0000</b>	<b>204.3300</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2023****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	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3462	301.3462	0.0717	0.0000	303.1383
<b>Total</b>	<b>0.2045</b>	<b>1.8700</b>	<b>2.1117</b>	<b>3.5000e-003</b>		<b>0.0910</b>	<b>0.0910</b>		<b>0.0856</b>	<b>0.0856</b>	<b>0.0000</b>	<b>301.3462</b>	<b>301.3462</b>	<b>0.0717</b>	<b>0.0000</b>	<b>303.1383</b>

**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	8.6500e-003	0.3356	0.0637	1.1300e-003	0.0276	3.3000e-004	0.0279	7.9700e-003	3.2000e-004	8.2900e-003	0.0000	107.5708	107.5708	5.6200e-003	0.0000	107.7114
Worker	0.0470	0.0286	0.3083	1.0000e-003	0.1123	7.3000e-004	0.1130	0.0298	6.7000e-004	0.0305	0.0000	90.3179	90.3179	2.0400e-003	0.0000	90.3690
<b>Total</b>	<b>0.0557</b>	<b>0.3642</b>	<b>0.3720</b>	<b>2.1300e-003</b>	<b>0.1398</b>	<b>1.0600e-003</b>	<b>0.1409</b>	<b>0.0378</b>	<b>9.9000e-004</b>	<b>0.0388</b>	<b>0.0000</b>	<b>197.8887</b>	<b>197.8887</b>	<b>7.6600e-003</b>	<b>0.0000</b>	<b>198.0805</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2023****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	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3458	301.3458	0.0717	0.0000	303.1380
<b>Total</b>	<b>0.2045</b>	<b>1.8700</b>	<b>2.1117</b>	<b>3.5000e-003</b>		<b>0.0910</b>	<b>0.0910</b>		<b>0.0856</b>	<b>0.0856</b>	<b>0.0000</b>	<b>301.3458</b>	<b>301.3458</b>	<b>0.0717</b>	<b>0.0000</b>	<b>303.1380</b>

**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	8.6500e-003	0.3356	0.0637	1.1300e-003	0.0276	3.3000e-004	0.0279	7.9700e-003	3.2000e-004	8.2900e-003	0.0000	107.5708	107.5708	5.6200e-003	0.0000	107.7114
Worker	0.0470	0.0286	0.3083	1.0000e-003	0.1123	7.3000e-004	0.1130	0.0298	6.7000e-004	0.0305	0.0000	90.3179	90.3179	2.0400e-003	0.0000	90.3690
<b>Total</b>	<b>0.0557</b>	<b>0.3642</b>	<b>0.3720</b>	<b>2.1300e-003</b>	<b>0.1398</b>	<b>1.0600e-003</b>	<b>0.1409</b>	<b>0.0378</b>	<b>9.9000e-004</b>	<b>0.0388</b>	<b>0.0000</b>	<b>197.8887</b>	<b>197.8887</b>	<b>7.6600e-003</b>	<b>0.0000</b>	<b>198.0805</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2024****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	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
<b>Total</b>	<b>0.1928</b>	<b>1.7611</b>	<b>2.1179</b>	<b>3.5300e-003</b>		<b>0.0803</b>	<b>0.0803</b>		<b>0.0756</b>	<b>0.0756</b>	<b>0.0000</b>	<b>303.7223</b>	<b>303.7223</b>	<b>0.0718</b>	<b>0.0000</b>	<b>305.5179</b>

**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	8.4500e-003	0.3355	0.0606	1.1300e-003	0.0278	3.3000e-004	0.0281	8.0300e-003	3.2000e-004	8.3500e-003	0.0000	107.5787	107.5787	5.7500e-003	0.0000	107.7224
Worker	0.0443	0.0259	0.2867	9.7000e-004	0.1131	7.2000e-004	0.1138	0.0301	6.6000e-004	0.0307	0.0000	87.5527	87.5527	1.8500e-003	0.0000	87.5991
<b>Total</b>	<b>0.0527</b>	<b>0.3614</b>	<b>0.3472</b>	<b>2.1000e-003</b>	<b>0.1409</b>	<b>1.0500e-003</b>	<b>0.1420</b>	<b>0.0381</b>	<b>9.8000e-004</b>	<b>0.0391</b>	<b>0.0000</b>	<b>195.1315</b>	<b>195.1315</b>	<b>7.6000e-003</b>	<b>0.0000</b>	<b>195.3215</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2024****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	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
<b>Total</b>	<b>0.1928</b>	<b>1.7611</b>	<b>2.1179</b>	<b>3.5300e-003</b>		<b>0.0803</b>	<b>0.0803</b>		<b>0.0756</b>	<b>0.0756</b>	<b>0.0000</b>	<b>303.7220</b>	<b>303.7220</b>	<b>0.0718</b>	<b>0.0000</b>	<b>305.5175</b>

**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	8.4500e-003	0.3355	0.0606	1.1300e-003	0.0278	3.3000e-004	0.0281	8.0300e-003	3.2000e-004	8.3500e-003	0.0000	107.5787	107.5787	5.7500e-003	0.0000	107.7224
Worker	0.0443	0.0259	0.2867	9.7000e-004	0.1131	7.2000e-004	0.1138	0.0301	6.6000e-004	0.0307	0.0000	87.5527	87.5527	1.8500e-003	0.0000	87.5991
<b>Total</b>	<b>0.0527</b>	<b>0.3614</b>	<b>0.3472</b>	<b>2.1000e-003</b>	<b>0.1409</b>	<b>1.0500e-003</b>	<b>0.1420</b>	<b>0.0381</b>	<b>9.8000e-004</b>	<b>0.0391</b>	<b>0.0000</b>	<b>195.1315</b>	<b>195.1315</b>	<b>7.6000e-003</b>	<b>0.0000</b>	<b>195.3215</b>



## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2025****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	0.0362	0.3305	0.4262	7.1000e-004		0.0140	0.0140		0.0132	0.0132	0.0000	61.4587	61.4587	0.0145	0.0000	61.8198
<b>Total</b>	<b>0.0362</b>	<b>0.3305</b>	<b>0.4262</b>	<b>7.1000e-004</b>		<b>0.0140</b>	<b>0.0140</b>		<b>0.0132</b>	<b>0.0132</b>	<b>0.0000</b>	<b>61.4587</b>	<b>61.4587</b>	<b>0.0145</b>	<b>0.0000</b>	<b>61.8198</b>

**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	0.0673	0.0117	2.3000e-004	5.6200e-003	7.0000e-005	5.6900e-003	1.6200e-003	6.0000e-005	1.6900e-003	0.0000	21.6085	21.6085	1.1800e-003	0.0000	21.6380
Worker	8.4000e-003	4.7400e-003	0.0534	1.9000e-004	0.0229	1.4000e-004	0.0230	6.0800e-003	1.3000e-004	6.2100e-003	0.0000	17.0113	17.0113	3.4000e-004	0.0000	17.0197
<b>Total</b>	<b>0.0101</b>	<b>0.0720</b>	<b>0.0651</b>	<b>4.2000e-004</b>	<b>0.0285</b>	<b>2.1000e-004</b>	<b>0.0287</b>	<b>7.7000e-003</b>	<b>1.9000e-004</b>	<b>7.9000e-003</b>	<b>0.0000</b>	<b>38.6198</b>	<b>38.6198</b>	<b>1.5200e-003</b>	<b>0.0000</b>	<b>38.6577</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.4 Building Construction - 2025****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	0.0362	0.3305	0.4262	7.1000e-004		0.0140	0.0140		0.0132	0.0132	0.0000	61.4586	61.4586	0.0145	0.0000	61.8198
<b>Total</b>	<b>0.0362</b>	<b>0.3305</b>	<b>0.4262</b>	<b>7.1000e-004</b>		<b>0.0140</b>	<b>0.0140</b>		<b>0.0132</b>	<b>0.0132</b>	<b>0.0000</b>	<b>61.4586</b>	<b>61.4586</b>	<b>0.0145</b>	<b>0.0000</b>	<b>61.8198</b>

**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	0.0673	0.0117	2.3000e-004	5.6200e-003	7.0000e-005	5.6900e-003	1.6200e-003	6.0000e-005	1.6900e-003	0.0000	21.6085	21.6085	1.1800e-003	0.0000	21.6380
Worker	8.4000e-003	4.7400e-003	0.0534	1.9000e-004	0.0229	1.4000e-004	0.0230	6.0800e-003	1.3000e-004	6.2100e-003	0.0000	17.0113	17.0113	3.4000e-004	0.0000	17.0197
<b>Total</b>	<b>0.0101</b>	<b>0.0720</b>	<b>0.0651</b>	<b>4.2000e-004</b>	<b>0.0285</b>	<b>2.1000e-004</b>	<b>0.0287</b>	<b>7.7000e-003</b>	<b>1.9000e-004</b>	<b>7.9000e-003</b>	<b>0.0000</b>	<b>38.6198</b>	<b>38.6198</b>	<b>1.5200e-003</b>	<b>0.0000</b>	<b>38.6577</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.5 Paving - 2025****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	0.0343	0.3218	0.5467	8.5000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	75.0722	75.0722	0.0243	0.0000	75.6792
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0343</b>	<b>0.3218</b>	<b>0.5467</b>	<b>8.5000e-004</b>		<b>0.0157</b>	<b>0.0157</b>		<b>0.0144</b>	<b>0.0144</b>	<b>0.0000</b>	<b>75.0722</b>	<b>75.0722</b>	<b>0.0243</b>	<b>0.0000</b>	<b>75.6792</b>

**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	1.6500e-003	9.3000e-004	0.0105	4.0000e-005	4.5000e-003	3.0000e-005	4.5200e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.3434	3.3434	7.0000e-005	0.0000	3.3451
<b>Total</b>	<b>1.6500e-003</b>	<b>9.3000e-004</b>	<b>0.0105</b>	<b>4.0000e-005</b>	<b>4.5000e-003</b>	<b>3.0000e-005</b>	<b>4.5200e-003</b>	<b>1.2000e-003</b>	<b>3.0000e-005</b>	<b>1.2200e-003</b>	<b>0.0000</b>	<b>3.3434</b>	<b>3.3434</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>3.3451</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.5 Paving - 2025****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	0.0343	0.3218	0.5467	8.5000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	75.0721	75.0721	0.0243	0.0000	75.6791
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0343</b>	<b>0.3218</b>	<b>0.5467</b>	<b>8.5000e-004</b>		<b>0.0157</b>	<b>0.0157</b>		<b>0.0144</b>	<b>0.0144</b>	<b>0.0000</b>	<b>75.0721</b>	<b>75.0721</b>	<b>0.0243</b>	<b>0.0000</b>	<b>75.6791</b>

**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	1.6500e-003	9.3000e-004	0.0105	4.0000e-005	4.5000e-003	3.0000e-005	4.5200e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.3434	3.3434	7.0000e-005	0.0000	3.3451
<b>Total</b>	<b>1.6500e-003</b>	<b>9.3000e-004</b>	<b>0.0105</b>	<b>4.0000e-005</b>	<b>4.5000e-003</b>	<b>3.0000e-005</b>	<b>4.5200e-003</b>	<b>1.2000e-003</b>	<b>3.0000e-005</b>	<b>1.2200e-003</b>	<b>0.0000</b>	<b>3.3434</b>	<b>3.3434</b>	<b>7.0000e-005</b>	<b>0.0000</b>	<b>3.3451</b>

## Parkwood Subdivision - San Joaquin Valley Unified APCD Air District, Annual

**3.6 Architectural Coating - 2025****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	5.0515					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4100e-003	0.0430	0.0678	1.1000e-004		1.9300e-003	1.9300e-003		1.9300e-003	1.9300e-003	0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
<b>Total</b>	<b>5.0579</b>	<b>0.0430</b>	<b>0.0678</b>	<b>1.1000e-004</b>		<b>1.9300e-003</b>	<b>1.9300e-003</b>		<b>1.9300e-003</b>	<b>1.9300e-003</b>	<b>0.0000</b>	<b>9.5747</b>	<b>9.5747</b>	<b>5.2000e-004</b>	<b>0.0000</b>	<b>9.5878</b>

**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	2.4200e-003	1.3700e-003	0.0154	5.0000e-005	6.6000e-003	4.0000e-005	6.6400e-003	1.7500e-003	4.0000e-005	1.7900e-003	0.0000	4.9037	4.9037	1.0000e-004	0.0000	4.9061
<b>Total</b>	<b>2.4200e-003</b>	<b>1.3700e-003</b>	<b>0.0154</b>	<b>5.0000e-005</b>	<b>6.6000e-003</b>	<b>4.0000e-005</b>	<b>6.6400e-003</b>	<b>1.7500e-003</b>	<b>4.0000e-005</b>	<b>1.7900e-003</b>	<b>0.0000</b>	<b>4.9037</b>	<b>4.9037</b>	<b>1.0000e-004</b>	<b>0.0000</b>	<b>4.9061</b>

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**3.6 Architectural Coating - 2025****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	5.0515					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4100e-003	0.0430	0.0678	1.1000e-004		1.9300e-003	1.9300e-003		1.9300e-003	1.9300e-003	0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
<b>Total</b>	<b>5.0579</b>	<b>0.0430</b>	<b>0.0678</b>	<b>1.1000e-004</b>		<b>1.9300e-003</b>	<b>1.9300e-003</b>		<b>1.9300e-003</b>	<b>1.9300e-003</b>	<b>0.0000</b>	<b>9.5747</b>	<b>9.5747</b>	<b>5.2000e-004</b>	<b>0.0000</b>	<b>9.5878</b>

**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	2.4200e-003	1.3700e-003	0.0154	5.0000e-005	6.6000e-003	4.0000e-005	6.6400e-003	1.7500e-003	4.0000e-005	1.7900e-003	0.0000	4.9037	4.9037	1.0000e-004	0.0000	4.9061
<b>Total</b>	<b>2.4200e-003</b>	<b>1.3700e-003</b>	<b>0.0154</b>	<b>5.0000e-005</b>	<b>6.6000e-003</b>	<b>4.0000e-005</b>	<b>6.6400e-003</b>	<b>1.7500e-003</b>	<b>4.0000e-005</b>	<b>1.7900e-003</b>	<b>0.0000</b>	<b>4.9037</b>	<b>4.9037</b>	<b>1.0000e-004</b>	<b>0.0000</b>	<b>4.9061</b>

**4.0 Operational Detail - Mobile**



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**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Improve Pedestrian Network

	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	1.0339	11.1213	10.4766	0.0490	2.9042	0.0449	2.9491	0.7812	0.0424	0.8236	0.0000	4,551.3880	4,551.3880	0.3134	0.0000	4,559.2232
Unmitigated	1.0640	11.4878	11.0549	0.0521	3.1194	0.0478	3.1673	0.8391	0.0452	0.8843	0.0000	4,833.9062	4,833.9062	0.3204	0.0000	4,841.9168

**4.2 Trip Summary Information**

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	2,822.56	2,822.56	2822.56	8,179,262	7,614,893
Total	2,822.56	2,822.56	2,822.56	8,179,262	7,614,893

**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	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3

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**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.506092	0.032602	0.169295	0.124521	0.019914	0.005374	0.021664	0.110051	0.001797	0.001623	0.005307	0.000969	0.000792

**5.0 Energy Detail**

Historical Energy Use: N

**5.1 Mitigation Measures Energy**

Install Energy Efficient Appliances

	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	337.9566	337.9566	0.0338	6.9900e-003	340.8852
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	344.5686	344.5686	0.0345	7.1300e-003	347.5545
NaturalGas Mitigated	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	417.1677	417.1677	8.0000e-003	7.6500e-003	419.6467
NaturalGas Unmitigated	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	417.1677	417.1677	8.0000e-003	7.6500e-003	419.6467

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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	7.81743e+006	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	417.1677	417.1677	8.0000e-003	7.6500e-003	419.6467
<b>Total</b>		<b>0.0422</b>	<b>0.3602</b>	<b>0.1533</b>	<b>2.3000e-003</b>		<b>0.0291</b>	<b>0.0291</b>		<b>0.0291</b>	<b>0.0291</b>	<b>0.0000</b>	<b>417.1677</b>	<b>417.1677</b>	<b>8.0000e-003</b>	<b>7.6500e-003</b>	<b>419.6467</b>

**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	7.81743e+006	0.0422	0.3602	0.1533	2.3000e-003		0.0291	0.0291		0.0291	0.0291	0.0000	417.1677	417.1677	8.0000e-003	7.6500e-003	419.6467
<b>Total</b>		<b>0.0422</b>	<b>0.3602</b>	<b>0.1533</b>	<b>2.3000e-003</b>		<b>0.0291</b>	<b>0.0291</b>		<b>0.0291</b>	<b>0.0291</b>	<b>0.0000</b>	<b>417.1677</b>	<b>417.1677</b>	<b>8.0000e-003</b>	<b>7.6500e-003</b>	<b>419.6467</b>

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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	2.61946e+006	344.5686	0.0345	7.1300e-003	347.5545
<b>Total</b>		<b>344.5686</b>	<b>0.0345</b>	<b>7.1300e-003</b>	<b>347.5545</b>

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	2.5692e+006	337.9566	0.0338	6.9900e-003	340.8852
<b>Total</b>		<b>337.9566</b>	<b>0.0338</b>	<b>6.9900e-003</b>	<b>340.8852</b>

**6.0 Area Detail****6.1 Mitigation Measures Area**

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## Use only Natural Gas Hearths

	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	2.6876	0.1375	2.2725	8.3000e-004		0.0213	0.0213		0.0213	0.0213	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131
Unmitigated	2.6876	0.1375	2.2725	8.3000e-004		0.0213	0.0213		0.0213	0.0213	0.0000	133.1555	133.1555	6.0000e-003	2.3700e-003	134.0131

## 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	0.5052					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1019					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0131	0.1119	0.0476	7.1000e-004		9.0400e-003	9.0400e-003		9.0400e-003	9.0400e-003	0.0000	129.5290	129.5290	2.4800e-003	2.3700e-003	130.2987
Landscaping	0.0674	0.0257	2.2249	1.2000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	3.6265	3.6265	3.5100e-003	0.0000	3.7144
<b>Total</b>	<b>2.6876</b>	<b>0.1375</b>	<b>2.2725</b>	<b>8.3000e-004</b>		<b>0.0213</b>	<b>0.0213</b>		<b>0.0213</b>	<b>0.0213</b>	<b>0.0000</b>	<b>133.1555</b>	<b>133.1555</b>	<b>5.9900e-003</b>	<b>2.3700e-003</b>	<b>134.0131</b>

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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	0.5052					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1019					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0131	0.1119	0.0476	7.1000e-004		9.0400e-003	9.0400e-003		9.0400e-003	9.0400e-003	0.0000	129.5290	129.5290	2.4800e-003	2.3700e-003	130.2987
Landscaping	0.0674	0.0257	2.2249	1.2000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	3.6265	3.6265	3.5100e-003	0.0000	3.7144
<b>Total</b>	<b>2.6876</b>	<b>0.1375</b>	<b>2.2725</b>	<b>8.3000e-004</b>		<b>0.0213</b>	<b>0.0213</b>		<b>0.0213</b>	<b>0.0213</b>	<b>0.0000</b>	<b>133.1555</b>	<b>133.1555</b>	<b>5.9900e-003</b>	<b>2.3700e-003</b>	<b>134.0131</b>

**7.0 Water Detail****7.1 Mitigation Measures Water**



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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	25.7009	0.6367	0.0154	46.2065
Unmitigated	25.7009	0.6367	0.0154	46.2065

**7.2 Water by Land Use****Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	19.4811 / 12.2815	25.7009	0.6367	0.0154	46.2065
<b>Total</b>		<b>25.7009</b>	<b>0.6367</b>	<b>0.0154</b>	<b>46.2065</b>

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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	19.4811 / 12.2815	25.7009	0.6367	0.0154	46.2065
<b>Total</b>		<b>25.7009</b>	<b>0.6367</b>	<b>0.0154</b>	<b>46.2065</b>

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

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	78.9716	4.6671	0.0000	195.6488
Unmitigated	78.9716	4.6671	0.0000	195.6488

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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	389.04	78.9716	4.6671	0.0000	195.6488
<b>Total</b>		<b>78.9716</b>	<b>4.6671</b>	<b>0.0000</b>	<b>195.6488</b>

**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	389.04	78.9716	4.6671	0.0000	195.6488
<b>Total</b>		<b>78.9716</b>	<b>4.6671</b>	<b>0.0000</b>	<b>195.6488</b>

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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## 10.0 Stationary Equipment

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### 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

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# Off-road Mobile (Construction) Energy Usage

Note: For the sake of simplicity, and as a conservative estimation, it was assumed that all off-road vehicles use diesel fuel as an energy source. Site preparation and grading energy were used as the basis of this calculation.

Given Factor:	369.49	metric tons	CO2	(provided in CalEEMod Output File)
Conversion Factor:	2204.62	pounds	per metric ton	
Intermediate Result:	814,582	pounds	CO2	
Conversion Factor(1):	22.38	pounds	CO2 per 1 gallon of diesel fuel	
Final Result:	36,397.75	gallons	diesel fuel	

(1) Source: U.S. EIA, 2016. Website: <http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>

## On-road Mobile (Operational) Energy Usage

Note: For the sake of simplicity, it was assumed that passenger vehicles, light duty trucks, motorcycles, and mobile homes use gasoline, and all medium-duty trucks, heavy-duty trucks, and buses use diesel fuel.

Step 1: **Total Net Daily Trips (provided by Fehr & Peers)**

2,823

<u>H-W</u>	<u>H-S</u>	<u>H-O</u>
<b>Trip Length (miles) (provided by CalEEMod)</b>		
10.8	7.3	7.5
<b>Trip %</b>		
45.60%	19.00%	35.40%
<b>Average Trip Length (weighted average)</b>		
8.9668		

Therefore:

**Average Daily VMT:**  
25,313

Step 2: Given:

**Fleet Mix (provided by CalEEMod v2016.3.2)**

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
50.6%	3.3%	16.9%	12.5%	2.0%	0.5%	2.2%	11.0%	0.2%	0.2%	0.5%	0.0%	0.0%

And:

**Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LDA	LDT1	LDT2	MDV	MCY	MH	OBUS
28.7	23.68	21.21	15.08	35.5	6.53	6.52

**Diesel MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LHD1	LHD2	MHD	HHD	UBUS	SBUS
17.15	15.55	8.08	5.52	4.49	7.23

Therefore:

**Weighted Average MPG Factors**

Gasoline: 25.0 Diesel: 7.6

Step 3: **Therefore:**

850 daily gallons of gasoline 533 daily gallons of diesel

or

**Result:** 310,239.59 annual gallons of gasoline 194,715 annual gallons of diesel

## On-road Mobile (Construction) Energy Usage - Site Preparation

Site preparation, and grading energy were used as the basis of this calculation.

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

18

**Worker Trip Length (miles) (provided by CalEEMod)**

10.8

Therefore:

**Average Worker Daily VMT:**

194

Step 2: **Given:**

**Assumed Fleet Mix for Workers**

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

**Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LDA	LDT1	LDT2
28.7	23.68	21.21

Therefore:

**Weighted Average Worker MPG Factor**

24.5

Step 3: **Therefore:**

7.9 Worker daily gallons of gasoline

Step 4: 40 # of Days (see CalEEMod)

Therefore:

**Result:** 317 Total gallons of gasoline



## On-road Mobile (Construction) Energy Usage - Grading

Site preparation, and grading energy were used as the basis of this calculation.

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

20

**Worker Trip Length (miles) (provided by CalEEMod)**

10.8

Therefore:

**Average Worker Daily VMT:**

216

Step 2: **Given:**

**Assumed Fleet Mix for Workers**

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

**Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LDA	LDT1	LDT2
28.7	23.68	21.21

Therefore:

**Weighted Average Worker MPG Factor**

24.5

Step 3: **Therefore:**

8.8 Worker daily gallons of gasoline

Step 4: 110 # of Days (see CalEEMod)

Therefore:

**Result:** 969 Total gallons of gasoline

On-road Mobile (Construction) Energy Usage - Building Construction

Site preparation, and grading energy were used as the basis of this calculation.

Step 1:	Total Daily Worker Trips (provided by CalEEMod)	Total Daily Vendor Trips (provided by CalEEMod)	Total Daily Hauler Trips (provided by CalEEMod)
	108	32	0
	Worker Trip Length (miles) (provided by CalEEMod)	Vendor Trip Length (miles) (provided by CalEEMod)	Hauling Trip Length (miles) (provided by CalEEMod)
	10.8	7.3	0
	Therefore:		
	Average Worker Daily VMT:	Average Vendor Daily VMT:	Average Hauling Daily VMT:
	1,166.40	234	-

Step 2:	Given:
	Assumed Fleet Mix for Workers
	LDA LDT1 LDT2
	0.33333333 0.3333333 0.3333333
	Assumed Fleet Mix for Vendors
	MHD HHD
	0.5 0.5

And:  
MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021

Gasoline:	Diesel:
LDA LDT1 LDT2	MHD HHD
28.7 23.68 21.21	8.08 5.52

Therefore:		
Weighted Average Worker (Gasoline) MPG Factor	Weighted Average Vendor (Diesel) MPG Factor	Weighted Average Hauling MPG Factor
24.5	6.8	0.0

Step 3:	Therefore:	Therefore:
	48 Worker daily gallons of gasoline	34 Vendor daily gallons of diesel

Step 4:	1110 # of Days (see CalEEMod)
---------	-------------------------------

Therefore:	Therefore:
Result: 52,780 Total gallons of gasoline	38,132 Total gallons of diesel

## On-road Mobile (Construction) Energy Usage - Paving

Site preparation, and grading energy were used as the basis of this calculation.

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

15

**Worker Trip Length (miles) (provided by CalEEMod)**

10.8

Therefore:

**Average Worker Daily VMT:**

162

Step 2: **Given:**

**Assumed Fleet Mix for Workers**

LDA	LDT1	LDT2
0.33333333	0.33333333	0.33333333

And:

**Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LDA	LDT1	LDT2
28.7	23.68	21.21

Therefore:

**Weighted Average Worker MPG Factor**

24.5

Step 3: **Therefore:**

6.6 Worker daily gallons of gasoline

Step 4: 75 # of Days (see CalEEMod)

Therefore:

**Result:** 495 Total gallons of gasoline

## On-road Mobile (Construction) Energy Usage - Architectural Coating

Site preparation, and grading energy were used as the basis of this calculation.

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

22

**Worker Trip Length (miles) (provided by CalEEMod)**

10.8

Therefore:

**Average Worker Daily VMT:**

238

Step 2: **Given:**

**Assumed Fleet Mix for Workers**

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

**Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2021**

LDA	LDT1	LDT2
28.7	23.68	21.21

Therefore:

**Weighted Average Worker MPG Factor**

24.5

Step 3: **Therefore:**

9.7 Worker daily gallons of gasoline

Step 4: 75 # of Days (see CalEEMod)

Therefore:

**Result:** 726 Total gallons of gasoline

# **Appendix B**

## **Environmental Noise Assessment**



## Environmental Noise Assessment

# Parkwood Residential

City of Hughson, California

April 7, 2020

Project # 190306

**Prepared for:**

**De Novo Planning Group**

1020 Suncastr Lane, Suite 106  
El Dorado Hills, California 95762

**Prepared by:**

**Saxelby Acoustics LLC**

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This section provides a general description of the existing noise sources in the project vicinity, a discussion of the regulatory setting, and identifies potential noise impacts associated with the proposed project. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment. Mitigation measures have been identified for significant noise-related impacts.

### 3.10.1 ENVIRONMENTAL SETTING

#### KEY TERMS

<b>Acoustics</b>	The science of sound.
<b>Ambient Noise</b>	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
<b>Attenuation</b>	The reduction of noise.
<b>A-Weighting</b>	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response. A-weighted dB values are expressed as dBA.
<b>Decibel or dB</b>	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
<b>CNEL</b>	Community noise equivalent level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
<b>Frequency</b>	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
<b>Impulsive</b>	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
<b>L<sub>dn</sub></b>	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
<b>L<sub>eq</sub></b>	Equivalent or energy-averaged sound level.
<b>L<sub>max</sub></b>	The highest root-mean-square (RMS) sound level measured over a given period of time.
<b>L<sub>(n)</sub></b>	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L <sub>50</sub> is the sound level exceeded 50 percent of the time during the one hour period.
<b>Loudness</b>	A subjective term for the sensation of the magnitude of sound.
<b>Noise</b>	Unwanted sound.
<b>SEL</b>	Sound exposure levels. A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.



## FUNDAMENTALS OF ACOUSTICS

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Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dB) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dB is generally perceived as a doubling in loudness. For example, a 70-dB sound is half as loud as an 80-dB sound, and twice as loud as a 60-dB sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average,

it tends to disguise short-term variations in the noise environment. CNEL is similar to  $L_{dn}$ , but includes a +5-dB penalty for evening noise. Table 3.10-1 lists several examples of the noise levels associated with common situations.

**TABLE 3.10-1: TYPICAL NOISE LEVELS**

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dB)	COMMON INDOOR ACTIVITIES
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. SEPTEMBER 2013.

## EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a 1 dB change cannot be perceived;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;

- A change in level of at least 5-dB is required before any noticeable change in human response would be expected; and
- A 10-dB change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

### EXISTING AND FUTURE NOISE AND VIBRATION ENVIRONMENTS

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#### Existing and Surrounding Land Uses

**North:** A Jehovah's Witness Kingdom Hall and two single-family residences form part of the north project boundary line along E Hatch Road, approximately 0 feet from the project boundary. BG Voss Orchards is located directly north of the project site, across East Hatch Road, along with a mix of industrial uses and additional residences within approximately 200 feet from the project site.

**East:** Hughson Christian high school is located approximately 760 feet east of the eastern project boundary and the Sterling Glen residential community is located approximately 0 feet to the east of the project site.

**South:** The Sterling Glen residential area is located approximately 0 feet south of the project site.

**West:** The Burlington Northern/Santa Fe (BNSF) Railroad, Duarte Nursery, and Wassum Ranch are located west of the project site, along Santa Fe Avenue.

#### Existing Ambient Noise Levels

To quantify the existing ambient noise environment in the Project Vicinity, short-term and continuous (24-hour) noise level measurements were conducted on the Project site on March 28<sup>th</sup> and 29<sup>th</sup>, 2019. The noise measurement locations are shown on Figure 3.10-1. The noise level measurement survey results are provided in Table 3.10-2. Appendix A of Appendix F shows the complete results of the noise monitoring survey.

The sound level meters were programmed to collect hourly noise level intervals at each site during the survey. The maximum value ( $L_{max}$ ) represents the highest noise level measured during an interval. The average value ( $L_{eq}$ ) represents the energy average of all of the noise measured during an interval. The median value ( $L_{50}$ ) represents the sound level exceeded 50 percent of the time during an interval.

**TABLE 3.10-2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA**

SITE	LOCATION	DATE/TIME	L <sub>DN</sub>	AVERAGE MEASURED HOURLY NOISE LEVELS, dB					
				DAYTIME (7AM-10PM)			NIGHTTIME (10PM-7AM)		
				L <sub>EQ</sub>	L <sub>50</sub>	L <sub>MAX</sub>	L <sub>EQ</sub>	L <sub>50</sub>	L <sub>MAX</sub>
Continuous (24-hour) Noise Level Measurements									
LT-1	290-ft. to centerline of E. Hatch Rd. 105-ft. to centerline of Santa Fe Ave. 190-ft. to centerline of railroad.	03/28/19-03/29/19	73	68	56	92	66	50	81
LT-2	215-ft. to centerline of E. Hatch Rd.	03/28/19-03/29/19	62	57	54	75	55	50	71
LT-3	360-ft. to centerline of Santa Fe Avenue.	03/28/19-03/29/19	65	60	51	81	59	48	73
Short-Term Noise Level Measurements									
ST-1	150-ft. to centerline of E. Hatch Road.	03/29/19 11:19 AM	NA	60	50	76	Primary noise source is traffic on E Hatch Rd.		
ST-2	1480-ft. to centerline of Santa Fe Avenue.	03/28/19 10:32 AM	NA	49	39	68	Primary noise source is traffic on Santa Fe Ave.		

SOURCE: SAXELBY ACOUSTICS, 2019.

Larson Davis Laboratories (LDL) Model 820, Model 812, and Model 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

## Railroad Noise

Saxelby Acoustics performed measurements of train events on the project site at measurement location LT-1. Measurements were conducted over a 24-hour period using a Larson Davis Laboratories model 820 sound meter at a distance of 190 feet from the centerline of the BNSF railroad line. Based upon the noise monitoring conducted at this location, approximately 35 train events were observed in a 24-hour period, with six of the trains occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The day/night average noise level for trains was found to be 72 dB L<sub>dn</sub> at the measurement site. The 60 dBA L<sub>dn</sub> railroad noise contour, which is the City's normally acceptable noise standard, extends to an approximate distance of 1,186 feet from the railroad centerline.

### Existing Traffic Noise Environment at Off-Site Receptors

#### OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To predict existing noise levels due to traffic, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calven reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly  $L_{eq}$  values for free-flowing traffic conditions. While the newer FHWA traffic noise model (TNM 3.0) is required for use on federally funded highway projects, the FHWA RD-77-108 model is still widely used in the industry and recognized as an accurate screening tool, typically resulting in slight over-predictions in traffic noise levels at typical receptor setback distances.

Traffic volumes for existing conditions were obtained from the traffic data prepared for the project (KD Anderson, April 2019). Truck percentages and vehicle speeds on the local area roadways were estimated from field observations and feedback from the City.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. Where traffic noise barriers are predominately along a roadway segment, a -5 offset was added to the noise prediction model to account for various noise barrier heights. A -5 to dB offset was also applied where outdoor activity areas are shielded by intervening buildings. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

Table 3.10-3 shows the existing traffic noise levels in terms of  $L_{dn}$  at closest sensitive receptors along each roadway segment. A complete listing of the FHWA Model input data is contained in Appendix B of Appendix F. It should be noted that the distances shown in Table 3.10-3 are measured from roadway centerline to the center of the outdoor area of the closest typical residential setback.

**TABLE 3.10-3: EXISTING TRAFFIC NOISE LEVELS**

ROADWAY	SEGMENT	APPROXIMATE RECEPTOR DISTANCE	EXTERIOR TRAFFIC NOISE LEVEL, dB L <sub>DN</sub>
Hatch Road	Santa Fe Avenue to Tully Road	75	67.2
Tully Road	Hatch Road to Narcisco Way	45	57.8
Santa Fe Avenue	Hatch Road project access	100	63.2
Santa Fe Avenue	Project access to Los Alamos Drive	50	62.8
Walnut Haven Drive	Heartnut Way to Tully Road	45	51.0
Graybark Lane	Heartnut Way to Tully Road	45	52.5
Leaflet Lane	Flora Vista Drive to Heartnut Way	40	50.0
Flora Vista Drive	Project site to Los Alamos Drive	40	52.1
Estancia Drive	Leaflet Lane to Flora Vista Drive	40	45.1
Flora Vista Drive	Estancia Drive to Ester Marie Drive	40	54.1
Fox Road	Ester Marie Avenue to Tully Road	40	54.9

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

## DISCUSSION OF TRAFFIC NOISE MODEL ACCURACY

### *Traffic Noise Prediction Accuracy for Santa Fe Avenue*

Saxelby Acoustics measured continuous (24-hour) noise levels at site LT-1 which was located approximately 105 feet from the centerline of Santa Fe Avenue. At this location, the total measured noise level was found to be 73.0 dBA L<sub>dn</sub>. The total noise exposure at this location is due primarily to trains on the BNSF rail line which were measured to be 72.0 dBA L<sub>dn</sub>. The predicted traffic noise level for Santa Fe Avenue at LT-1 (105 feet from Santa Fe Avenue centerline) is 63.2 dBA L<sub>dn</sub>. Using decibel addition, the total noise exposure considering both traffic and railroad noise is 72.5 dBA. This is accurate within 0.5 dBA of the total noise exposure measured at site LT-1. This is well within the industry accepted tolerance of 3 dBA as required by Caltrans for highway noise predictions.

### *Traffic Noise Prediction Accuracy for Hatch Road*

Saxelby Acoustics measured continuous (24-hour) noise levels at site LT-2 which was located approximately 215 feet from the centerline of Hatch Road. At this location, the total measured noise level was found to be 61.9 dBA  $L_{dn}$ . The total noise exposure at this location is due to trains on the BNSF rail line and traffic on E. Hatch Road. Train noise at this location was measured to be 59.4 dBA  $L_{dn}$ . The predicted traffic noise level for E. Hatch Road at LT-2 (215 feet from E. Hatch Road centerline) is 59.2 dBA  $L_{dn}$ . Using decibel addition, the total noise exposure considering both traffic and railroad noise is 62.3 dBA. This is accurate within 0.4 dBA of the total noise exposure measured at site LT-2. This is well within the industry accepted tolerance of 3 dBA as required by Caltrans for highway noise predictions.



## 3.10.2 REGULATORY SETTING

### FEDERAL

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There are no federal regulations related to noise that apply to the proposed project.

### STATE

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#### **California Environmental Quality Act**

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

#### **California State Building Codes**

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB  $L_{dn}$  or CNEL in any habitable room.

Title 24 also mandates that for structures containing noise-sensitive uses to be located where the  $L_{dn}$  or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment

#### **City of Hughson General Plan**

The City of Hughson General Plan Noise Element includes the following goals, policies, and actions regarding noise that are applicable to the proposed project:

##### NOISE ELEMENT - GOALS AND POLICIES

**Goal N-1** Minimize the exposure of community residents to excessive noise.

**Policy N-1.1** The City will utilize the noise/land use compatibility standards in Figure N-1 [Figure 3.10-2] as a guide for future planning and development decisions, as well as the projected future noise contours for the buildout of the General Plan, shown in Figure N-2 and detailed in Table N-2.

**Policy N-1.2** The City will maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources, to the extent feasible.

**Policy N-1.3** New development of residential or other noise sensitive land uses should not be allowed in noise impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels in outdoor activity areas to 60 dB L<sub>dn</sub> or less. Interior levels should be reduced to 45dB L<sub>dn</sub> or less in all new residential developments.

**Policy N-1.4** The City should require new development deemed to be noise generators to minimize noise at the source through site design, building design, landscaping, hours of operation and other techniques.

**Policy N-1.5** During all phases of construction activity, the City will require project developers to incorporate mitigation measures that minimize the exposure of neighboring properties to excessive noise levels.

**Action N-1.1** Enforce the Hughson Noise Ordinance to avoid unnecessary and unusual noise during the hours of 10 p.m. to 7 a.m. Monday through Friday, and 10 p.m. to 8 a.m. Saturday, Sunday and holidays.

**Action N-1.2** Require acoustical analyses for proposed sensitive land uses to be located within the 60 dB L<sub>dn</sub> noise contour, or in the vicinity of existing and proposed commercial and industrial areas. Acoustical analyses will also be required for commercial and industrial uses proposed in the vicinity of existing or proposed sensitive land uses. Where the noise analyses indicate that the noise compatibility standards contained in the Noise Element will be exceeded, require noise control measures to be incorporated into the proposed development to reduce noise levels to the extent feasible.

**Action N-1.3** Require construction techniques for noise buffering, barriers or setbacks in development subject to high noise levels, such as the railroad and major roadways, to reduce noise to a level within the noise/land use compatibility standards, as shown in Figure N-1 [Figure 3.10-2]. Sound walls are discouraged, unless there is no other feasible design available to minimize noise impacts along major roadways and the railroad.

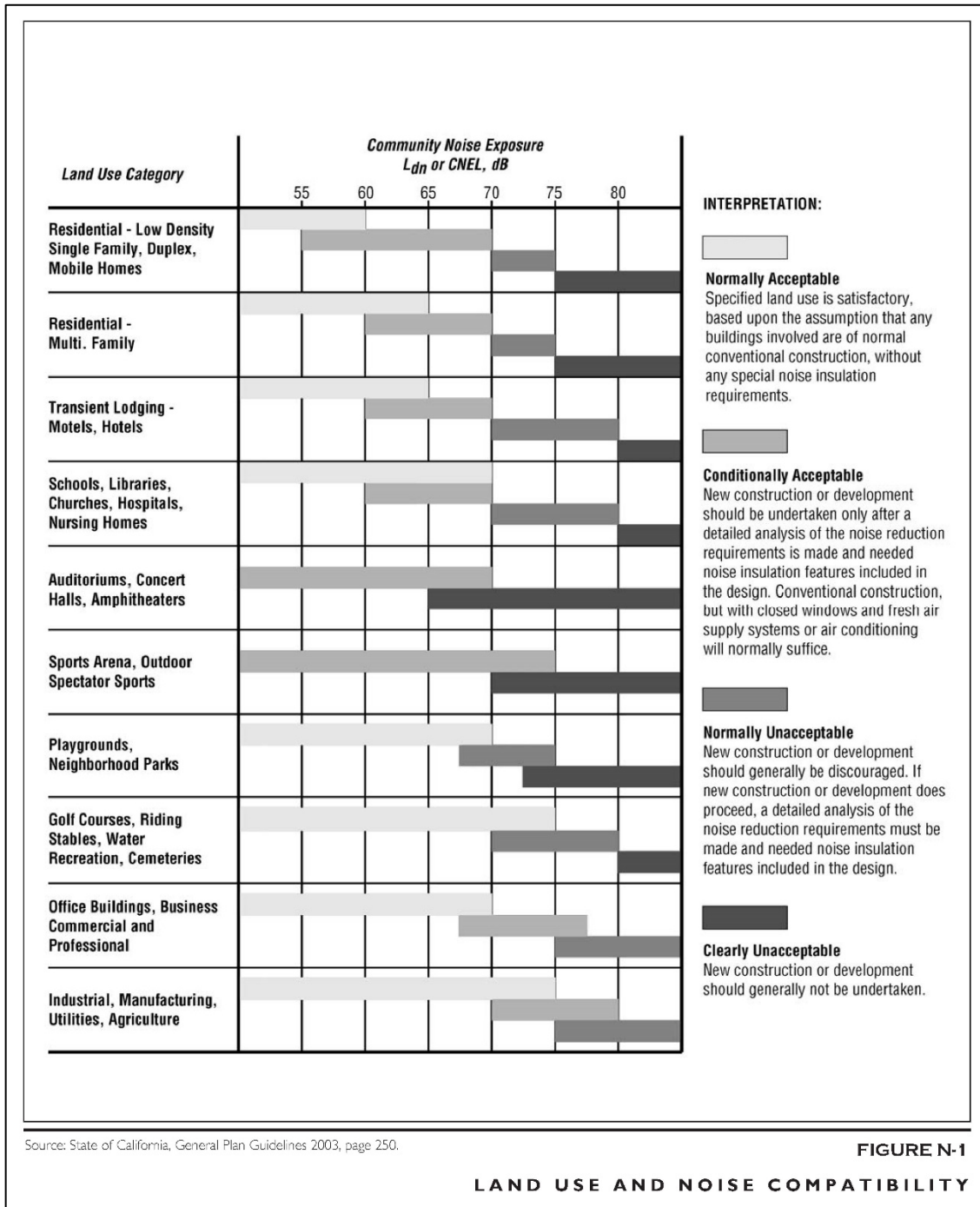


Figure 3.10-2: City of Hughson General Plan Noise Element Land Use and Noise Compatibility

**Goal N-2** Reduce noise levels from traffic and railroad operation.

**Policy N-2.1** The City should minimize potential transportation-related noise through street circulation design, coordination of routing and other traffic control measures, and consider use of “quiet” pavements when resurfacing roadways.

**Policy N-2.2** Truck traffic will be routed through and adjacent to Hughson in a manner that reduces truck-related noise impacts to sensitive land uses, as possible.

**Policy N-2.3** The City will seek to reduce impacts from ground borne vibrations associated with rail operations by requiring that habitable buildings are sited at least 100-feet from the centerline of the tracks, whenever feasible.

**Policy N-2.4** New residential development exposed to exterior railroad generated noise levels of 60 dB  $L_{dn}$  or greater should be designed to limit maximum single incident noise levels not to exceed 50 dB  $L_{max}$  in bedrooms and 55 dB  $L_{max}$  in other rooms.

**Action N-2.1** Encourage the BNSF Railroad to maintain existing track in good condition and minimize train horn soundings to the extent allowed by law.

**Action N-2.2** Require development of habitable buildings within 100-feet from the centerline of the railroad tracks to provide a study demonstrating that ground borne vibration issues associated with rail operations have been adequately addressed (i.e., through building siting or construction techniques).

**Action N-2.3** Coordinate with the County Sheriff’s Department to enforce the California Vehicle Code as it relates to adequate vehicle mufflers, modified exhaust systems and vehicle stereo systems.

**Action N-2.4** Establish a noise abatement protocol for existing sensitive land uses located in areas anticipated to experience significant noise increases with the implementation of the General Plan, as well as identify potential funding for an abatement program. Cumulative traffic noise impacts on existing noise sensitive uses could be reduced through the inclusion of exterior and/or interior sound reduction measures such as noise barriers, forced-air mechanical ventilation, and sound rated window construction.

### City of Hughson Municipal Code and Noise Ordinance

Chapter 9.30 of the Hughson Municipal Code establishes the following standards for noise:

#### 9.30.030 Prohibitions.

It shall be unlawful for any person to make or continue, or cause, or permit to be made or continued, any unnecessary or unusual noise which unreasonably disturbs the peace and quiet of any zone classified R-A, R-1, R-2, R-3, C-1, C-2 or C-3 or which causes discomfort or annoyance to any reasonable person of normal sensitivities located in any such zone, and may be heard, without further amplification, 50 feet or more from the source of the noise. (Ord. 90-02 § 1, 1990).

**9.30.040 Standards.**

The standards which shall be considered in determining whether a violation of the provisions of this section exist shall include, but not be limited to the following:

- A. The volume of the noise;
- B. The intensity of the noise;
- C. Whether the nature of the noise is natural or unnatural;
- D. The volume and density of background noise, if any;
- E. The proximity of the noise to residential sleeping facilities;
- F. The nature and zoning of the area in which the noise emanates, and that in which it is heard;
- G. The intensity of the inhabitation of the area in which the noise emanates and that in which it is heard;
- H. The duration of the noise; and
- I. Whether the noise is produced by commercial or noncommercial activity. (Ord. 90-02 § 1, 1990)

**9.30.050 Hours of enforcement.**

The hours for enforcement shall be between the hours of 10:00 p.m. through 7:00 a.m., Monday through Friday and 10:00 p.m. through 8:00 a.m., Saturday and Sunday and legal holidays as that term is defined in California Government Code Section 6700 as it now exists or shall be amended. (Ord. 90-02 § 1, 1990)

**9.30.060 Investigation.**

Upon receipt of a complaint from any person, the police department may investigate and assess whether the alleged noise levels exceed the noise standards in this chapter. (Ord. 90-02 § 1, 1990)

**9.30.070 Violation – Penalty.**

- A. Any person violating this chapter is guilty of an infraction.
- B. If, within a 24-hour period of the violation, there is a second violation by the same person, the violator shall be guilty of a misdemeanor for the separate offense.
- C. If, within the same 24-hour period, there are more than two violations by the same person, each such additional violation shall be deemed a separate and distinct violation and such violator shall be guilty of a misdemeanor for each such violation.
- D. Each day such violations are committed or permitted to continue shall constitute a separate offense and shall be punishable as such. (Ord. 90-02 § 1, 1990)

**9.30.080 Exemption.**

This chapter shall not be applicable to emergency work. (Ord. 90-02 § 1, 1990)

### VIBRATION STANDARDS

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Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The City does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by several factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3.10-8 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

**TABLE 3.10-8: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS**

PEAK PARTICLE VELOCITY		HUMAN REACTION	EFFECT ON BUILDINGS
MM/SEC.	IN./SEC.		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBOEN VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

### 3.10.3 IMPACTS AND MITIGATION MEASURES

#### THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the project will have a significant impact related to noise if it will result in:

Would the project:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to, or generate, excessive groundborne vibration or groundborne noise levels;
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the project;
- Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels without the project;
- Expose persons residing or working in the project area to excessive noise levels if located within an airport land use plan or where such a plan has not been adopted within 2 miles of a public airport or public use airport; or
- Expose persons residing or working in the project area to excessive noise levels if located within the vicinity of a private airstrip.



### Determination of a Significant Increase in Noise Levels

The noise standards applicable to the project include the relevant portions of the Hughson General Plan and the City's Municipal Code described in the Regulatory Framework Section above (Section 3.10.2), and the following standards. Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. Table 3.10-9 is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the  $L_{dn}$ .

**TABLE 3.10-9: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE**

<i>AMBIENT NOISE LEVEL WITHOUT PROJECT, <math>L_{dn}</math></i>	<i>INCREASE REQUIRED FOR SIGNIFICANT IMPACT</i>
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

Based on the Table 3.10-9 data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB  $L_{dn}$ , or 3 dB or more where existing noise levels are between 60 to 65 dB  $L_{dn}$ . Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB  $L_{dn}$ . The rationale for the Table 3.10-9 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

## Traffic Noise Environment at Off-Site Receptors with and without the Project

### OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

Implementation of the proposed project would result in an increase in ADT volumes on the local roadway network, and consequently, an increase in noise levels from traffic sources along affected segments. Tables 3.10-4 and 3.10-5 show the predicted traffic noise level increases on the local roadway network for Existing, Existing + Project, Cumulative No Project, and Cumulative + Project conditions. Appendix B of Appendix F provides the complete inputs and results of the FHWA traffic noise modeling. It should be noted that the distances shown in Table 3.10-4 and Table 3.10-5 are measured from roadway centerline to the center of the outdoor area of the closest typical residential setback.

**TABLE 3.10-4: EXISTING AND EXISTING PLUS PROJECT TRAFFIC NOISE LEVELS**

ROADWAY	SEGMENT	APPROXIMATE RECEPTOR DISTANCE	NOISE LEVELS ( $L_{DN}$ , dB) AT NEAREST SENSITIVE RECEPTORS				
			EXISTING	EXISTING + PROJECT	CHANGE	CRITERIA <sup>1</sup>	SIGNIFICANT?
Hatch Road	Santa Fe Avenue to Tully Road	75	67.2	67.2	0.0	+5 dB or > 60 dB	No
Tully Road	Hatch Road to Narcisco Way	45	57.8	58.0	0.1	+5 dB or > 60 dB	No
Santa Fe Avenue	Hatch Road project access	100	63.2	64.1	0.8	+3.0 dB	No
Santa Fe Avenue	Project access to Los Alamos Drive	50	62.8	62.9	0.2	+3.0 dB	No
Walnut Haven Drive	Heartnut Way to Tully Road	45	51.0	51.3	0.3	+5 dB or > 60 dB	No
Graybark Lane	Heartnut Way to Tully Road	45	52.5	54.0	1.5	+5 dB or > 60 dB	No
Leaflet Lane	Flora Vista Drive to Heartnut Way	40	50.0	52.9	3.0	+5 dB or > 60 dB	No
Flora Vista Drive	Project site to Los Alamos Drive	40	52.1	54.5	2.4	+5 dB or > 60 dB	No
Estancia Drive	Leaflet Lane to Flora Vista Drive	40	45.1	45.5	0.4	+5 dB or > 60 dB	No
Flora Vista Drive	Estancia Drive to Ester Marie Drive	40	54.1	55.4	1.3	+5 dB or > 60 dB	No
Fox Road	Ester Marie Avenue to Tully Road	40	54.9	56.0	1.1	+5 dB or > 60 dB	No

<sup>1</sup> WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 dB AN INCREASE OF 5 dB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 dB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 dB BUT ARE LESS THAN 65 dB, AN INCREASE OF 3 dB OR MORE WOULD BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 dB, AN INCREASE OF 1.5 dB OR MORE WOULD BE SIGNIFICANT.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KD ANDERSON AND SAXELBY ACOUSTICS. 2019.

## 3.10 NOISE

**TABLE 3.10-5: CUMULATIVE AND CUMULATIVE + PROJECT TRAFFIC NOISE LEVELS**

ROADWAY	SEGMENT	APPROXIMATE RECEPTOR DISTANCE	NOISE LEVELS ( $L_{DN}$ , dB) AT NEAREST SENSITIVE RECEPTORS				
			CUMULATIVE	CUMULATIVE + PROJECT	CHANGE	CRITERIA <sup>1</sup>	SIGNIFICANT?
Hatch Road	Santa Fe Avenue to Tully Road	75	67.9	67.9	0.0	+5 dB or > 60 dB	No
Tully Road	Hatch Road to Narcisco Way	45	60.3	60.4	0.1	+3.0 dB	No
Santa Fe Avenue	Hatch Road project access	100	65.9	66.4	0.5	+1.5 dB	No
Santa Fe Avenue	Project access to Los Alamos Drive	50	65.5	65.6	0.1	+1.5 dB	No
Walnut Haven Drive	Heartnut Way to Tully Road	45	51.2	51.5	0.3	+5 dB or > 60 dB	No
Graybark Lane	Heartnut Way to Tully Road	45	53.3	54.6	1.3	+5 dB or > 60 dB	No
Leaflet Lane	Flora Vista Drive to Heartnut Way	40	51.8	54.0	2.1	+5 dB or > 60 dB	No
Flora Vista Drive	Project site to Los Alamos Drive	40	53.4	55.3	1.9	+5 dB or > 60 dB	No
Estancia Drive	Leaflet Lane to Flora Vista Drive	40	45.5	45.9	0.4	+5 dB or > 60 dB	No
Flora Vista Drive	Estancia Drive to Ester Marie Drive	40	54.9	56.0	1.1	+5 dB or > 60 dB	No
Fox Road	Ester Marie Avenue to Tully Road	40	55.5	56.5	1.0	+5 dB or > 60 dB	No

<sup>1</sup> WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 dB AN INCREASE OF 5 dB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 dB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 dB BUT ARE LESS THAN 65 dB, AN INCREASE OF 3 dB OR MORE WOULD BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 dB, AN INCREASE OF 1.5 dB OR MORE WOULD BE SIGNIFICANT.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KD ANDERSON AND SAXELBY ACOUSTICS. 2019.

Based upon data in Tables 3.10-4 and 3.10-5, the proposed project is predicted to result in a maximum traffic noise level increase of 3.0 dB.

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## EVALUATION OF TRANSPORTATION NOISE ON PROJECT SITE

### **Railroad Noise Levels**

The proposed residential uses are located approximately 150 feet from the centerline of the BNSF railroad centerline. Measured noise levels at 190 feet from the railroad were found to be 72 dB  $L_{dn}$ . At a distance of 150 feet, railroad noise levels are predicted to be 73.0 dB  $L_{dn}$ .

### **Traffic Noise Levels**

#### Santa Fe Avenue

Cumulative plus project traffic noise levels are predicted to be 66 dB  $L_{dn}$  at a distance of 100 feet from the centerline of Santa Fe Avenue. The proposed residential uses are located approximately 50 feet from the centerline of Santa Fe Avenue. At this distance traffic noise levels are predicted to be 69.3 dB  $L_{dn}$ .

#### Hatch Road

Cumulative plus project traffic noise levels are predicted to be 56.7 dB  $L_{dn}$  at the nearest proposed residential uses located along Hatch Road.

### **Combined Traffic and Railroad Noise Level**

The combined traffic and railroad noise level is estimated to be 74.6 dB  $L_{dn}$  at the nearest proposed residential uses along Santa Fe Avenue.

**Construction Noise Environment**

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) was used to predict noise levels for standard construction equipment used for roadway improvement projects. The assessment of potential significant noise effects due to construction is based on the standards and procedures described in the Federal Transit Authority (FTA) guidance manual and FHWA's RCNM.

The RCNM is a Windows-based noise prediction model that enables the prediction of construction noise levels for a variety of construction equipment based on a compilation of empirical data and the application of acoustical propagation formulas. It enables the calculation of construction noise levels in more detail than the manual methods, which eliminates the need to collect extensive amounts of project-specific input data. RCNM allows for the modeling of multiple pieces of construction equipment working either independently or simultaneously, the character of noise emission, and the usage factors for each piece of equipment.

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week), and the duration of the construction work.

Noise sources in the RCNM database include actual noise levels and equipment usage percentages. This source data was used in this construction noise analysis. Table 3.10-6 shows predicted construction noise levels for each of the project construction phases. These assumptions are consistent with the air quality assessment prepared for the project.

**TABLE 3.10-6: CONSTRUCTION EQUIPMENT NOISE LEVELS FOR PRIMARY CONSTRUCTION PHASES**

Equipment	Quantity	Usage (%)	Maximum, $L_{\max}$ (dBA at 50 feet)	Hourly Average, $L_{eq}$ (dBA at 50 feet)
<b>Site Preparation</b>				
Dozer	3	40	82	83
Tractor/Loader/Backhoe	4	40	84	86
<b>Total:</b>				<b>88</b>
<b>Grading</b>				
Excavator	2	40	81	80
Grader	1	40	85	81
Dozer	1	40	82	78
Scraper	2	40	84	83
Tractor/Loader/Backhoe	2	40	84	83
<b>Total:</b>				<b>88</b>
<b>Building Construction</b>				
Crane	1	16	81	73
Forklift	3	40	83	84
Generator	1	50	81	78
Tractor/Loader/Backhoe	3	40	84	85
Welder/Torch	1	40	74	70
<b>Total:</b>				<b>88</b>
<b>Paving</b>				
Paver	2	50	77	77
Paving Equipment	2	50	77	77
Rollers	2	20	80	76
<b>Total:</b>				<b>81</b>
<b>Architectural Coating</b>				
Air Compressor	1	40	79	75
<b>Total:</b>				<b>75</b>

Source: FHWA, Roadway Construction Noise Model (RCNM), January 2006.

Based upon the Table 3.10-6 data, site preparation, grading, and building construction are predicted to be the loudest phases of construction with an average noise exposure of 88 dBA  $L_{eq}$  at 50 feet. Saxelby Acoustics used the SoundPLAN noise model to calculate noise levels at the nearest sensitive receptors assuming the construction activity were uniformly distributed across the project site. The results of this analysis are shown graphically on Figure 3.10-3.

### Construction Vibration Environment

The primary vibration-generating activities associated with the proposed project would happen during construction when activities such as grading, utilities placement, and road construction occur. Table 3.10-7 shows the typical vibration levels produced by construction placement.

**TABLE 3.10-7: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT**

<i>TYPE OF EQUIPMENT</i>	<i>PEAK PARTICLE VELOCITY @ 25 FEET (INCHES/SECOND)</i>	<i>PEAK PARTICLE VELOCITY @ 50 FEET (INCHES/SECOND)</i>
Caisson drilling	0.089	0.031
Hoe Ram	0.089	0.031
Jackhammer	0.035	0.012
Large bulldozer	0.089	0.031
Loaded trucks	0.076	0.027
Small bulldozer	0.003	0.001
Vibratory Compactor/roller	0.210	0.074

SOURCE: FEDERAL TRANSIT ADMINISTRATION, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT GUIDELINES, SEPTEMBER 2018



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## IMPACTS AND MITIGATION MEASURES

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**IMPACT 1:        WOULD THE PROJECT GENERATE A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES?**

### TRAFFIC NOISE INCREASES

As shown in Tables 3.10-4 and 3.10-5, some noise-sensitive receptors located along the project-area roadways are currently exposed to exterior traffic noise levels exceeding the City of Hughson 60 dB  $L_{dn}$  exterior noise level standard for residential uses. These receptors would continue to experience elevated exterior noise levels with implementation of the proposed project. For example, sensitive receptors under Existing conditions located adjacent to Santa Fe Avenue experience an exterior noise level of approximately 62.8 dB  $L_{dn}$ . Under Existing + Project conditions, exterior traffic noise levels are predicted to be approximately 62.9 dB  $L_{dn}$ . Exterior noise levels in both scenarios exceed the City's exterior noise level standard of 60 dB  $L_{dn}$ . However, the project's contribution of 0.2 dB would not exceed the FICON criteria of 3 dB where existing noise levels are between 60 and 65 dB.

### OPERATIONAL NOISE INCREASES

The proposed project would include typical residential noise sources which would be compatible with the adjacent existing residential uses (a.k.a. neighborhood traffic, yard equipment, truck deliveries, garbage collected, etc.). Proposed neighborhood parks are located internal to the project site and would not impact off-site residential uses. Therefore, operational noise by the proposed project is not analyzed further.

### CONSTRUCTION NOISE

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Based upon the Figure 3.10-3 data, the proposed project is predicted to generate construction noise levels ranging between 58-69 dBA  $L_{eq}$  at the nearest noise-sensitive receptors.

Although there could be a relatively high short-term noise exposure potential causing an intermittent noise nuisance, the effect of construction activities on longer-term ambient noise levels would be small but could result in a temporary increase in ambient noise levels in the project vicinity that could result in annoyance or sleep disturbance of nearby sensitive receptors. Compliance with the City's permissible hours of construction to avoid late evenings, nights and Sundays, as well as implementing the best management noise reduction techniques and practices (both outlined in MM 3.10-1), would ensure that construction noise would not result in a substantial temporary increase in ambient noise levels that would result in annoyance or sleep disturbance of nearby sensitive receptors. Therefore, with implementation of MM 3.10-1, temporary construction noise impacts would be reduced to less than significant.

## EXTERIOR NOISE IMPACTS ON PROJECT SITE – NOT REQUIRED FOR CEQA

This analysis of exterior noise impacts is outside of the purview of CEQA based on recent case law and the updated Appendix G checklist in the 2019 CEQA Guidelines. As a result, this analysis is not necessary for CEQA compliance. Nonetheless, City staff wants to ensure that new residents are exposed to acceptable noise levels. Therefore, this analysis is not required for CEQA compliance but presented for full disclosure and for the City to determine the project's compliance with its General Plan policies on noise exposure.

Table 3.10-10 shows the predicted traffic and railroad noise levels at the proposed residential uses adjacent to the major project-area arterial roadways. Based upon Table 3.10-10, exterior noise levels would exceed the City's 60 dBA L<sub>dn</sub> normally acceptable exterior noise standard. The 60 dBA L<sub>dn</sub> noise contour for the BNSF railroad was found to extend to an approximate distance of 1,186 feet from the railroad centerline. This would extend into most of the project site. Therefore, use of a physical barrier would be the only feasible method to reduce exterior noise levels to within the City's allowable exterior noise standard range.

Table 3.10-10 also indicates the property line noise barrier heights required to achieve compliance with an exterior noise level standard of 60 dB L<sub>dn</sub>.

**TABLE 3.10-10: CUMULATIVE + PROJECT TRANSPORTATION NOISE LEVELS AT PROPOSED RESIDENTIAL USES**

SEGMENT	APPROXIMATE RESIDENTIAL SETBACK, FEET <sup>1</sup>	PREDICTED NOISE LEVELS, DB L <sub>DN</sub> <sup>2</sup>					
		NO BARRIER	8' BARRIER	9' BARRIER	10' BARRIER	11' BARRIER	12' BARRIER
Santa Fe Avenue	50	75	65	63	62	61	60
E Hatch Road	170	57	N/A	N/A	N/A	N/A	N/A

**NOTES:**

<sup>1</sup> SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.

<sup>2</sup> THE MODELED NOISE BARRIERS ASSUME FLAT SITE CONDITIONS WHERE ROADWAY ELEVATIONS, BASE OF WALL ELEVATIONS, AND BUILDING PAD ELEVATIONS ARE APPROXIMATELY EQUIVALENT. SOUND BARRIER HEIGHT MAY BE ACHIEVED THROUGH THE USE A WALL AND EARTHEN BERM TO ACHIEVE THE TOTAL HEIGHT (I.E. 8-FOOT WALL ON 2-FOOT BERM IS EQUIVALENT TO AN 10-FOOT TALL BARRIER).

SOURCE: SAXELBY ACOUSTICS. 2019.

The complete inputs and results of the barrier calculations are contained in the Noise Study Appendix C (see Appendix F of this MND). The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

The Table 3.10-10 data indicate that a noise barrier 12-feet in height would be required to achieve compliance with the City of Hughson 60 dB L<sub>dn</sub> exterior noise level standard for the proposed residential uses. It should be noted that Figure N-1 [Figure 3.10-2] of the City's General Plan notes that residential uses are conditionally compatible with exterior noise levels of up to 70 dB L<sub>dn</sub>,

assuming that interior noise levels are in compliance with the City's interior noise level standards. The City of Hughson has indicated that they would only support construction of a sound wall matching the height of the adjacent residential development to the south along Sante Fe Avenue. The adjacent residential development to the south currently has an 8-foot tall masonry wall on a 2-3-foot tall earthen berm. Therefore, it is expected that the proposed project would also include construction of an 8-foot tall masonry wall on a 2-3 foot tall earthen berm, for a total barrier height of 10-11 feet. Based upon Table 3.10-10, a 10-11 foot tall barrier would achieve an exterior noise level of 61-62 dBA  $L_{dn}$  which is well within the City's conditionally compatible exterior noise standard of up to 70 dB  $L_{dn}$ .

#### INTERIOR NOISE IMPACTS – NOT REQUIRED FOR CEQA

This analysis of interior noise impacts is outside of the purview of CEQA based on recent case law and the updated Appendix G checklist in the 2019 CEQA Guidelines. As a result, this analysis is not necessary for CEQA compliance. Nonetheless, City staff wants to ensure that new residents are exposed to acceptable noise levels. Therefore, this analysis is not required for CEQA compliance but presented for full disclosure and for the City to determine the project's compliance with its General Plan policies on noise exposure.

Modern construction typically provides a 25-dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB  $L_{dn}$ , or less, will typically comply with the City of Hughson 45 dB  $L_{dn}$  interior noise level standard. Additional noise reduction measures, such as acoustically-rated windows, are generally required for exterior noise levels exceeding 70 dB  $L_{dn}$ .

It should be noted that noise barriers do not typically reduce exterior noise levels at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first-floor exterior transportation noise levels up to 75 dBA  $L_{dn}$ . Mitigated first-floor noise levels of 62 dBA  $L_{dn}$  are expected after construction of sound barriers.

Based upon a 20-dB exterior-to-interior noise level reduction, interior noise levels are predicted to be up to 55 dB  $L_{dn}$  at second floors and 42 dBA  $L_{dn}$  at first floors. Accordingly, predicted interior noise levels along the first row of residential uses along Santa Fe Avenue are predicted to exceed the City's 45 dB  $L_{dn}$  interior noise level standard at second floor locations.

In addition to the City's 45 dB  $L_{dn}$  interior noise level standard, policy N-2.4 of the City's General Plan Noise Element required that residential uses exposed to exterior noise levels of 60 dB  $L_{dn}$ , or greater, "should be designed to limit maximum single incident noise levels not to exceed 50 dB  $L_{max}$  in bedrooms and 55 dB  $L_{max}$  in other rooms." Based upon the railroad noise measurements conducted for the project, average  $L_{max}$  noise levels for train operations was found to be 19 dB higher than the  $L_{dn}$  value. Therefore, the average maximum single incident noise level for railroad operations is predicted to be up to 94 dBA  $L_{max}$ . In order to meet the City's maximum noise level standard of 50 dB in bedrooms and 55 dB in other rooms, additional interior noise control measures will be required.

Appendix D (See Appendix F of this MND) shows an estimate of the interior noise control measures required to meet the City's interior noise level standards.

Implementation of the following mitigation measure will ensure that these potential impacts are reduced to a ***less-than-significant*** level.

#### MITIGATION MEASURE(S)

**Mitigation Measure 3.10-1:** To reduce potential construction noise impacts during project construction, the following multi-part mitigation measure shall be implemented for the project:

- All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
- Quiet construction equipment, particularly air compressors, are to be selected whenever possible.
- All stationary noise-generating construction equipment such as tree grinders and air compressors are to be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- Unnecessary idling of internal combustion engines is prohibited.
- The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- Construction shall be limited to 7 AM to 7 PM on weekdays and 8 AM to 4 PM on Saturdays with no work allowed on Sundays unless otherwise authorized by the City in writing.
- Staging areas on the project site shall be located in areas that maximize, to the extent feasible, the distance between staging activity and sensitive receptors.

**Condition of Approval 3.10-1 (Not a requirement for CEQA):** *An 8-foot tall masonry sound wall on a 2-3 foot tall earthen berm combination shall be constructed along the Santa Fe Avenue frontage, adjacent to proposed residential uses, in order to achieve the City's exterior noise standards. Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance. These requirements shall be included in the improvements plans prior to their approval by the City's Public Works Department. Figure 3.10-4 shows the recommended sound wall location.*

**Condition of Approval 3.10-2 (Not a requirement for CEQA):** *For the first two rows of lots adjacent to the Santa Fe Avenue right of way, it is anticipated that second floor exterior facades facing parallel or perpendicular to Santa Fe Avenue would need to be constructed of minimum one-coat stucco with 5/8" interior gypsum hung on a resilient channel and glazing having a minimum sound transmission*

class (STC) rating of 45 at bedrooms and STC 40 for other rooms. First floor facades of the same two rows of lots would likely require minimum one-coat stucco with STC 33 glazing. Facades facing away from Santa Fe Avenue would likely not require these measures. Due to the high level of exterior noise exposure, and the variability of materials having similar STC ratings, the applicant shall provide a detailed analysis of interior noise control measures once building plans become available. The analysis shall be prepared by a qualified noise control engineer and shall outline the specific measures required to meet the City's 45 dBA  $L_{dn}$  interior noise level standard, as well as the City's maximum ( $L_{max}$ ) noise standard of 50 dB in bedroom and 55 dB in other rooms. The interior noise control analysis shall be reviewed by City staff and the recommendations shall be incorporated into the project building plans.

Mechanical ventilation shall be provided to allow occupants to keep doors and windows closed for acoustic isolation.

Figure 3.10-4 shows the likely minimum interior noise control measures.

**IMPACT 2:        WOULD THE PROJECT GENERATE EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS?**

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural damage.

With the exception of vibratory compactors, the Table 3.10-7 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at a distance of 25 feet. Use of vibratory compactors within 26 feet of the adjacent buildings could cause vibrations in excess of 0.2 in/sec. Sensitive receptors which could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located approximately 10-15 feet, or further, from the project site.

Implementation of the following mitigation measure will ensure that these potential impacts are reduced to a **less-than-significant** level.

**MITIGATION MEASURE(S)**

**Mitigation Measure 3.10-4:** Any compaction required less than 26 feet from the adjacent residential structures shall be accomplished by using static drum rollers which use weight instead of vibrations to achieve soil compaction. As an alternative to this requirement, pre-construction crack documentation and construction vibration monitoring could be conducted to ensure that construction vibrations do not cause damage to any adjacent structures.

**IMPACT 3:**      **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?**

There are no airports in the project vicinity. Therefore, this impact is not applicable to the proposed project.





## Parkwood Residential

City of Hughson, California

Figure 3.10-1

Noise Measurement Sites

### Legend

-  Project Site
-  Noise Measurement - Long Term
-  Noise Measurement - Short Term



125 m      375 m      625 m

Projection: State Plane (California Zone 3) / NAD83 / meters  
Rev. Date: 04/01/2019



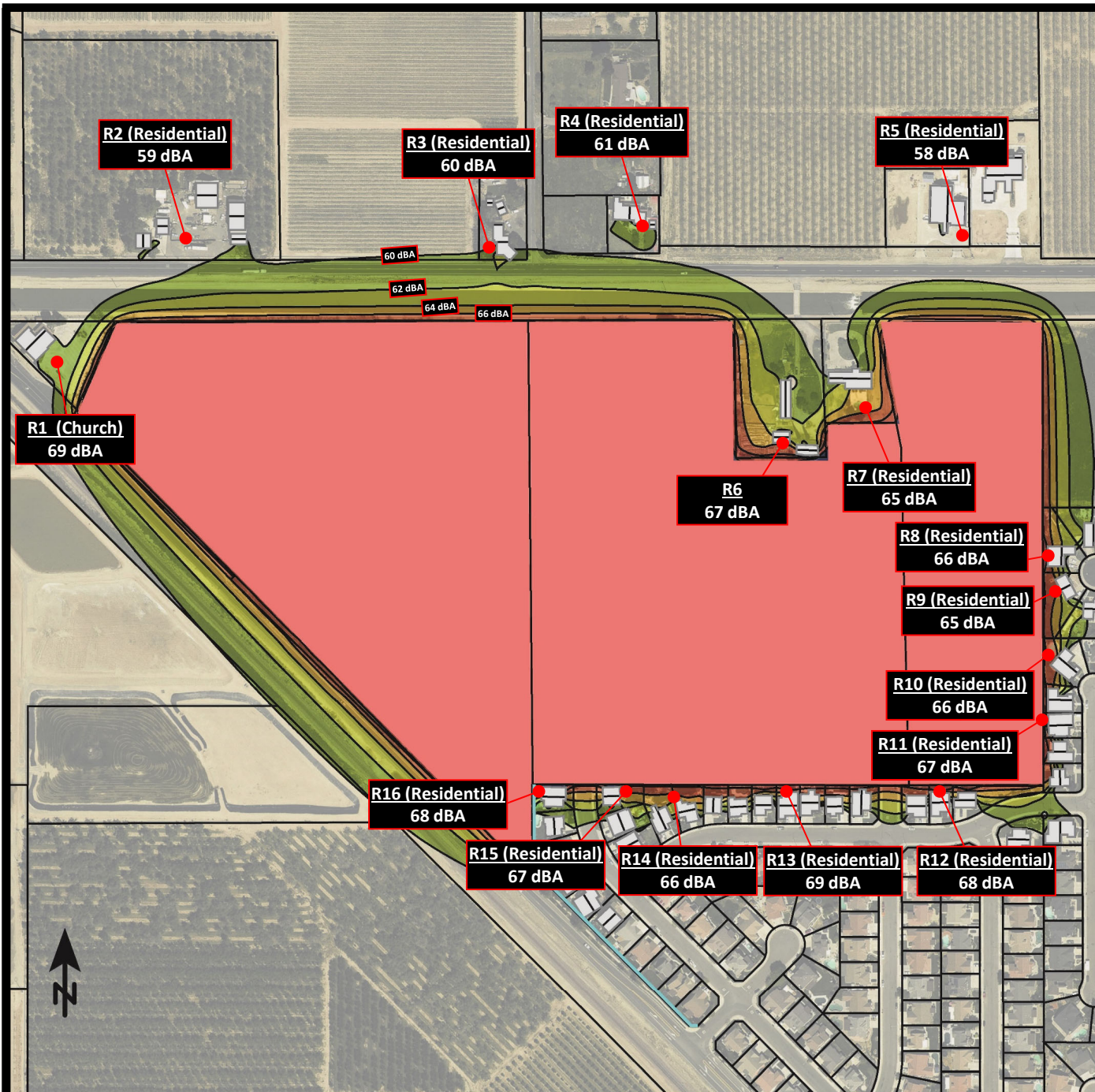
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# Parkwood Residential Project

City of Hughson, California

Figure 3.10-3

Predicted Loudest-Hour Construction Noise Levels (dBA,  $L_{eq}$ )



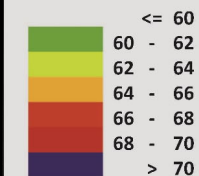
## Signs and symbols

- Parcel Line
- Existing Sound Wall
- Construction Noise Source

## Level tables

Level tables

## Levels in dB(A)



1 : 4601



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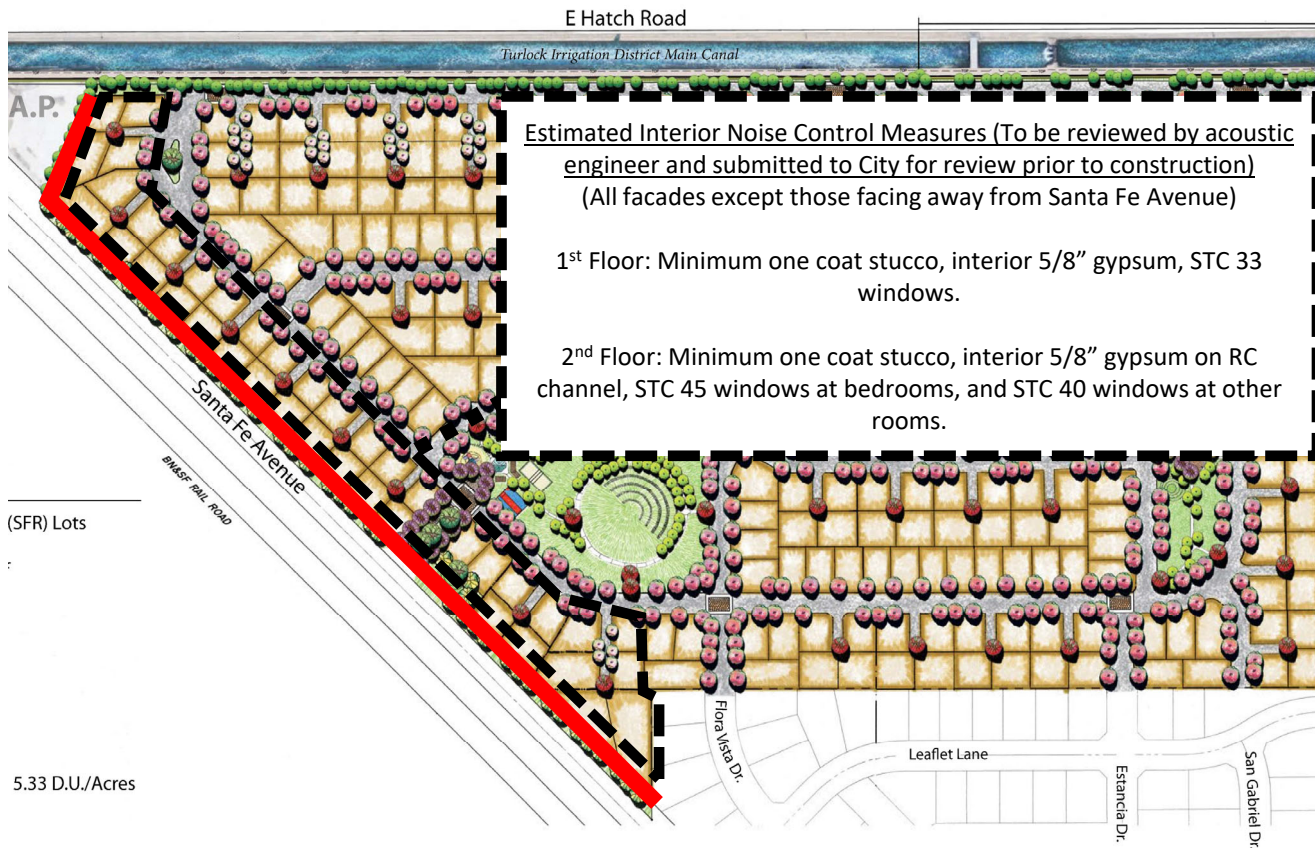
## Parkwood Residential

City of Hughson, California

Figure 3.10-4

Noise Control Measures

 : Sound Wall Location



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## Appendix A1: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L <sub>eq</sub>	L <sub>max</sub>	L <sub>50</sub>	L <sub>90</sub>
Thursday, March 28, 2019	10:00	63	82	54	46
Thursday, March 28, 2019	11:00	67	96	54	46
Thursday, March 28, 2019	12:00	71	98	55	47
Thursday, March 28, 2019	13:00	67	97	55	47
Thursday, March 28, 2019	14:00	70	96	56	48
Thursday, March 28, 2019	15:00	68	97	56	50
Thursday, March 28, 2019	16:00	65	85	56	49
Thursday, March 28, 2019	17:00	67	86	60	54
Thursday, March 28, 2019	18:00	72	98	58	52
Thursday, March 28, 2019	19:00	67	88	58	52
Thursday, March 28, 2019	20:00	65	93	55	49
Thursday, March 28, 2019	21:00	65	90	54	47
Thursday, March 28, 2019	22:00	56	75	50	45
Thursday, March 28, 2019	23:00	67	86	49	42
Friday, March 29, 2019	0:00	55	77	46	41
Friday, March 29, 2019	1:00	53	77	47	40
Friday, March 29, 2019	2:00	49	68	44	39
Friday, March 29, 2019	3:00	52	72	48	41
Friday, March 29, 2019	4:00	56	73	53	48
Friday, March 29, 2019	5:00	71	101	55	50
Friday, March 29, 2019	6:00	72	99	58	52
Friday, March 29, 2019	7:00	62	87	57	52
Friday, March 29, 2019	8:00	70	99	58	52
Friday, March 29, 2019	9:00	67	88	56	50

Statistics	Leq	Lmax	L50	L90
Day Average	68	92	56	49
Night Average	66	81	50	44
Day Low	62	82	54	46
Day High	72	99	60	54
Night Low	49	68	44	39
Night High	72	101	58	52
Ldn	73	Day %		71
CNEL	73	Night %		29

Site: LT-1

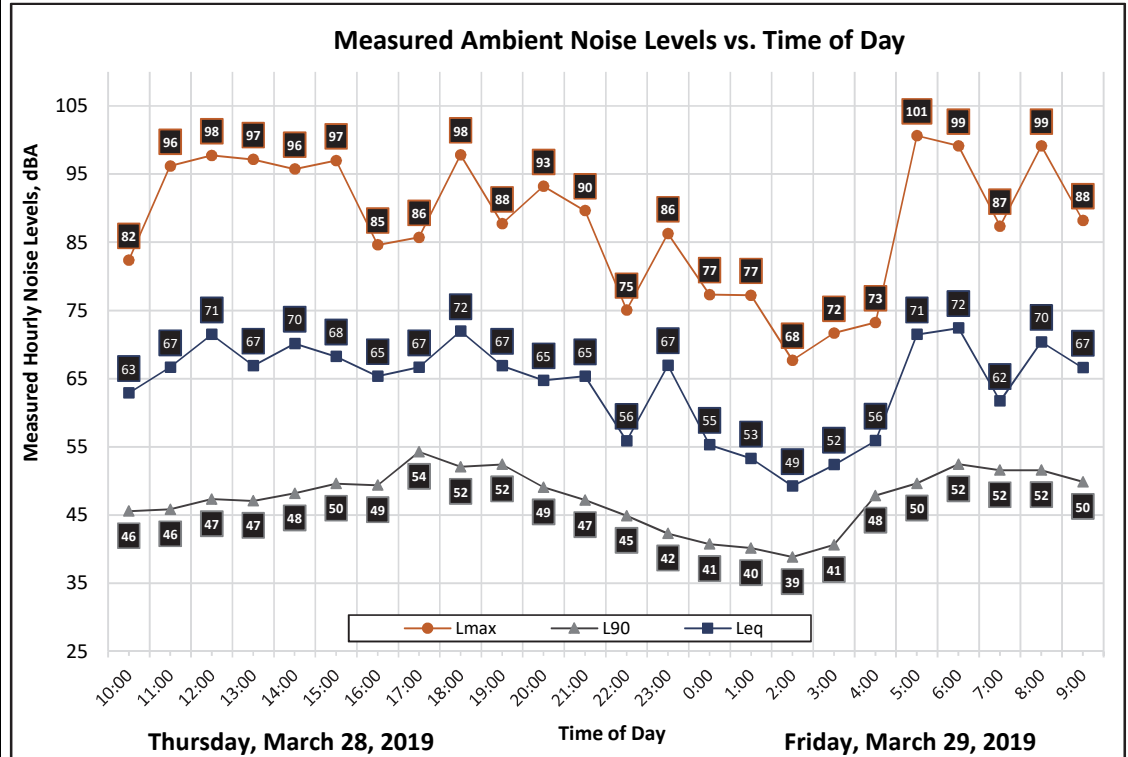
Project: Parkwood Residential

Location: Northwest project boundary

Coordinates: 37.6084592°, -120.8832037°

Meter: LDL 820-1

Calibrator: B&K 4230



## Appendix A2: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L <sub>eq</sub>	L <sub>max</sub>	L <sub>50</sub>	L <sub>90</sub>
Thursday, March 28, 2019	10:00	54	70	51	46
Thursday, March 28, 2019	11:00	54	67	51	47
Thursday, March 28, 2019	12:00	55	76	50	45
Thursday, March 28, 2019	13:00	54	77	50	45
Thursday, March 28, 2019	14:00	55	74	52	46
Thursday, March 28, 2019	15:00	54	70	52	47
Thursday, March 28, 2019	16:00	55	73	53	48
Thursday, March 28, 2019	17:00	59	80	57	52
Thursday, March 28, 2019	18:00	58	76	56	50
Thursday, March 28, 2019	19:00	61	85	57	52
Thursday, March 28, 2019	20:00	57	75	56	49
Thursday, March 28, 2019	21:00	55	71	52	45
Thursday, March 28, 2019	22:00	52	66	49	44
Thursday, March 28, 2019	23:00	54	75	48	42
Friday, March 29, 2019	0:00	51	67	47	42
Friday, March 29, 2019	1:00	51	68	46	41
Friday, March 29, 2019	2:00	50	65	45	40
Friday, March 29, 2019	3:00	52	69	48	41
Friday, March 29, 2019	4:00	54	66	52	46
Friday, March 29, 2019	5:00	59	83	55	49
Friday, March 29, 2019	6:00	60	78	58	54
Friday, March 29, 2019	7:00	58	73	57	54
Friday, March 29, 2019	8:00	58	79	56	51
Friday, March 29, 2019	9:00	58	76	55	49

Statistics	L <sub>eq</sub>	L <sub>max</sub>	L <sub>50</sub>	L <sub>90</sub>
Day Average	57	75	54	49
Night Average	55	71	50	44
Day Low	54	67	50	45
Day High	61	85	57	54
Night Low	50	65	45	40
Night High	60	83	58	54
Ldn	62	Day %		71
CNEL	62	Night %		29

Site: LT-2

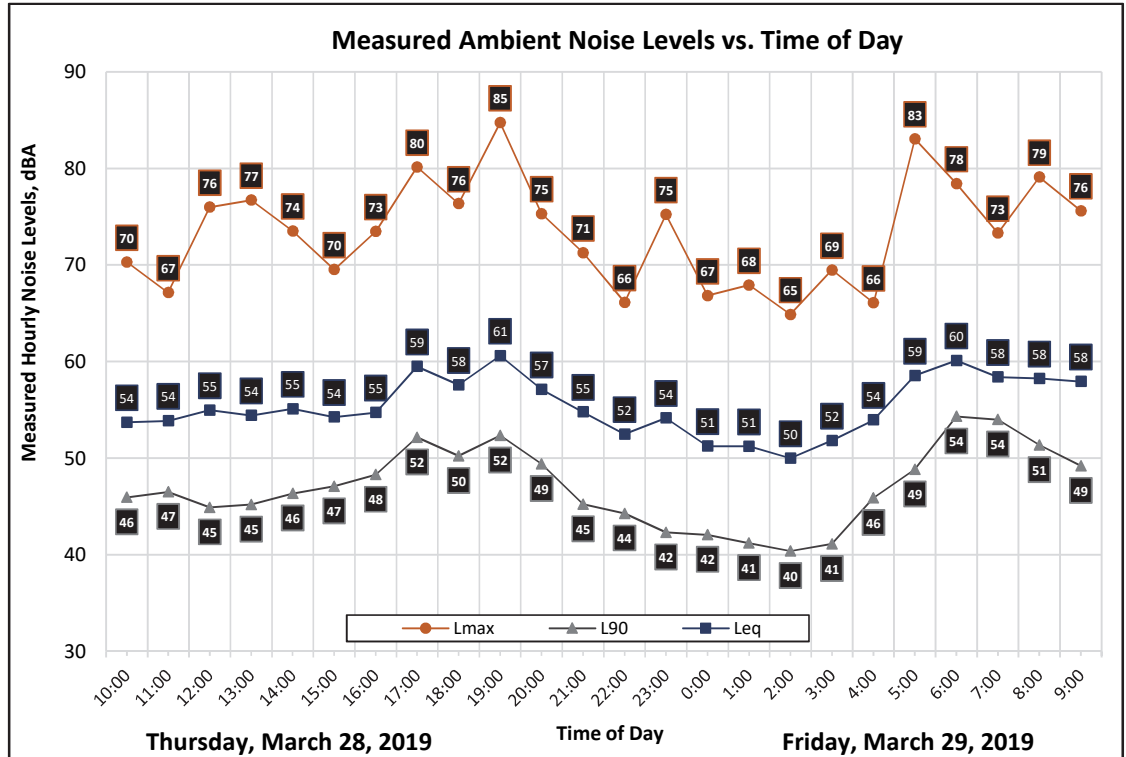
Project: Parkwood Residential

Location: North project boundary

Coordinates: 37.6086869°, -120.8779395°

Meter: LDL 812-2

Calibrator: B&K 4230



### Appendix A3: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L <sub>eq</sub>	L <sub>max</sub>	L <sub>50</sub>	L <sub>90</sub>
Thursday, March 28, 2019	10:00	57	79	46	38
Thursday, March 28, 2019	11:00	62	84	47	43
Thursday, March 28, 2019	12:00	61	82	48	42
Thursday, March 28, 2019	13:00	59	85	48	41
Thursday, March 28, 2019	14:00	62	88	49	43
Thursday, March 28, 2019	15:00	51	70	45	39
Thursday, March 28, 2019	16:00	55	74	48	43
Thursday, March 28, 2019	17:00	62	79	57	50
Thursday, March 28, 2019	18:00	63	86	54	50
Thursday, March 28, 2019	19:00	63	84	53	50
Thursday, March 28, 2019	20:00	58	83	52	48
Thursday, March 28, 2019	21:00	59	85	51	47
Thursday, March 28, 2019	22:00	50	68	48	44
Thursday, March 28, 2019	23:00	62	82	48	42
Friday, March 29, 2019	0:00	50	70	44	38
Friday, March 29, 2019	1:00	48	68	43	38
Friday, March 29, 2019	2:00	46	64	42	37
Friday, March 29, 2019	3:00	48	63	45	39
Friday, March 29, 2019	4:00	52	65	49	45
Friday, March 29, 2019	5:00	62	87	53	47
Friday, March 29, 2019	6:00	65	90	57	54
Friday, March 29, 2019	7:00	57	72	55	51
Friday, March 29, 2019	8:00	62	88	54	50
Friday, March 29, 2019	9:00	61	82	53	48

Statistics	Leq	Lmax	L50	L90
Day Average	60	81	51	46
Night Average	59	73	48	43
Day Low	51	70	45	38
Day High	63	88	57	51
Night Low	46	63	42	37
Night High	65	90	57	54
Ldn	65	Day %		71
CNEL	66	Night %		29

Site: LT-3

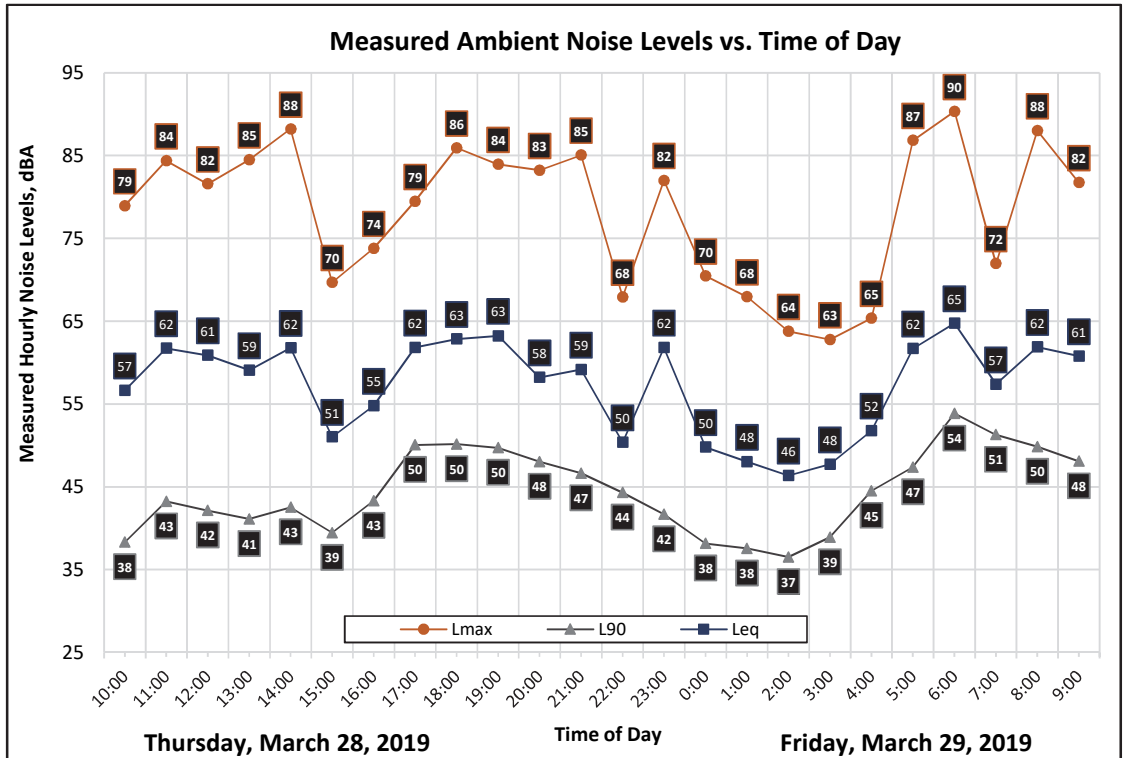
Project: Parkwood Residential

Location: Southwest project boundary

Coordinates: 37.6057266°, -120.8788387°

Meter: LDL 812-1

Calibrator: B&K 4230



Noise Measurement Site





## Appendix A4 : Short Term Noise Monitoring Results

Site: ST-1

Project: Parkwood Residential

Location: Northeast project boundary

Coordinates: 37.6088810 -120.8756701°

Meter: LDL 831-1

Calibrator: B&K 4230

Start: 2019-03-29 11:19:03

Stop: 2019-03-29 11:29:03

SLM: Model 831

Serial: 1800

### Measurement Results, dBA

Duration: 0:10

$L_{eq}$ : 60

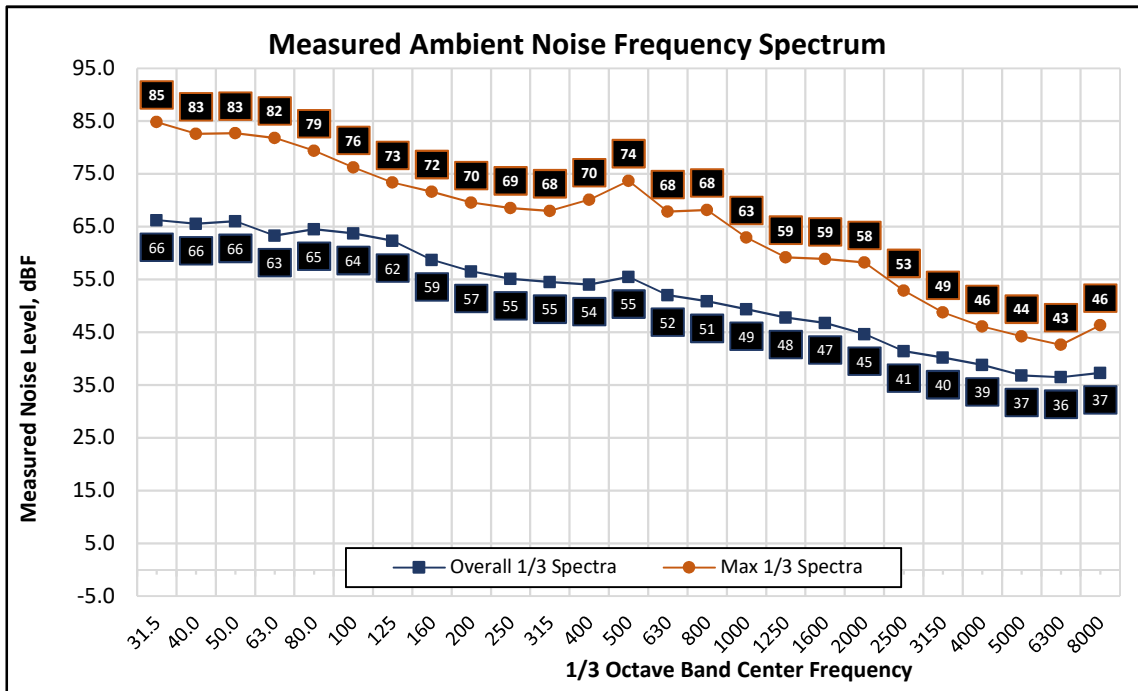
$L_{max}$ : 76

$L_{min}$ : 49

$L_{50}$ : 50

### Notes

Primary noise source is traffic on E Hatch Road. Max caused by train pass-by. 47-49 dB ambient.



## Appendix A5 : Short Term Noise Monitoring Results

Site: ST-2

Project: Parkwood Residential

Location: Southeast project boundary

Coordinates: 37.6057487 -120.8752744°

Meter: LDL 831-1

Calibrator: B&K 4230

Start: 2019-03-28 10:32:27

Stop: 2019-03-28 10:42:27

SLM: Model 831

Serial: 1800

### Measurement Results, dBA

Duration: 0:10

$L_{eq}$ : 49

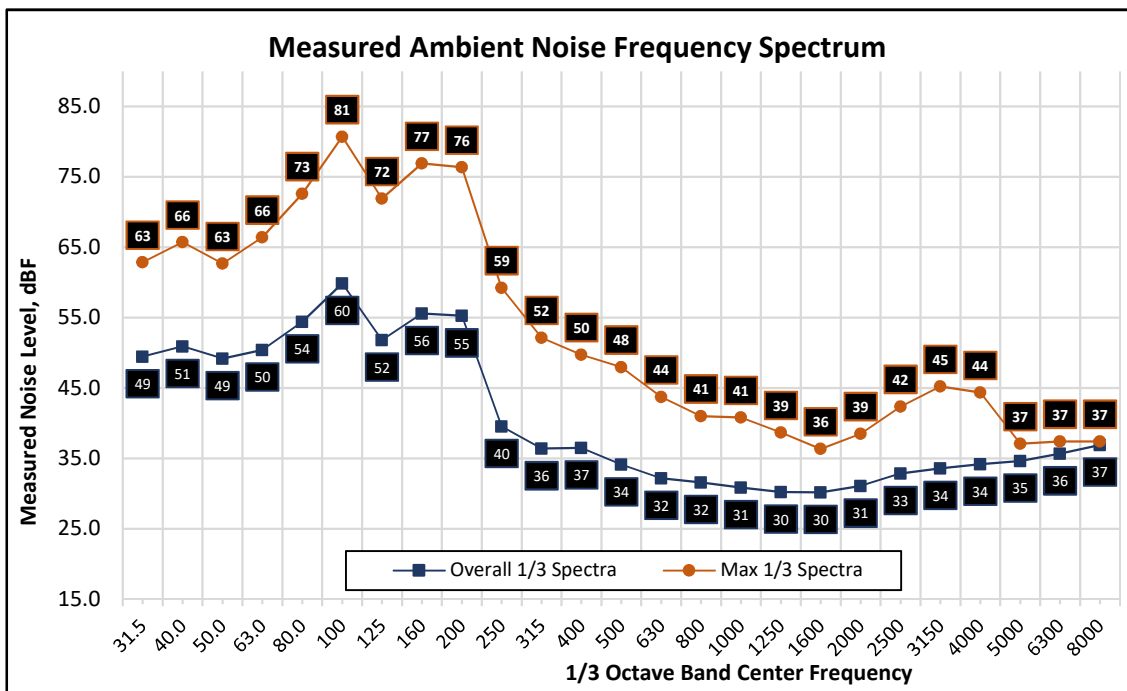
$L_{max}$ : 68

$L_{min}$ : 35

$L_{50}$ : 39

### Notes

Primary noise source is traffic on San Juan Ave. Max caused by train pass-by. 36-39 dB ambient.



## Appendix B-1

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 190306

Description: Parkwood Residential - Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Hatch Road	Santa Fe to Tully	10,909	82	0	18	3.0%	2.0%	50	75	0	227	105	49	67.2
2	Tully Road	Hatch to Narcisco	2,163	82	0	18	1.0%	1.0%	30	45	0	32	15	7	57.8
3	Santa Fe Avenue	Hath to Project Access	8,555	82	0	18	3.0%	2.0%	45	100	0	165	76	35	63.2
4	Santa Fe Avenue	Project Access to Los Alamos	8,555	82	0	18	3.0%	2.0%	45	50	-5	165	76	35	62.8
5	Walnut Haven Drive	Heartnut to Tully	453	82	0	18	1.0%	1.0%	30	45	0	11	5	2	51.0
6	Graybark Lane	Heartnut to Tully	628	82	0	18	1.0%	1.0%	30	45	0	14	7	3	52.5
7	Leaflet Lane	Flora Vista to Heartnut	297	82	0	18	1.0%	1.0%	30	40	0	9	4	2	50.0
8	Flora Vista Drive	Project Access to Los Alamos	484	82	0	18	1.0%	1.0%	30	40	0	12	6	3	52.1
9	Estancia Drive	Leaflet to Flora Vista	97	82	0	18	1.0%	1.0%	30	40	0	4	2	1	45.1
10	Flora Vista Drive	Estancia to Ester Marie	769	82	0	18	1.0%	1.0%	30	40	0	16	8	3	54.1
11	Fox Road	Ester Marie to Tully	926	82	0	18	1.0%	1.0%	30	40	0	18	8	4	54.9

## Appendix B-2

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 190306

Description: Parkwood Residential - Existing Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Hatch Road	Santa Fe to Tully	10,939	82	0	18	3.0%	2.0%	50	75	0	227	105	49	67.2
2	Tully Road	Hatch to Narcisco	2,238	82	0	18	1.0%	1.0%	30	45	0	33	15	7	58.0
3	Santa Fe Avenue	Hath to Project Access	10,325	82	0	18	3.0%	2.0%	45	100	0	187	87	40	64.1
4	Santa Fe Avenue	Project Access to Los Alamos	8,885	82	0	18	3.0%	2.0%	45	50	-5	169	78	36	62.9
5	Walnut Haven Drive	Heartnut to Tully	483	82	0	18	1.0%	1.0%	30	45	0	12	6	3	51.3
6	Graybark Lane	Heartnut to Tully	893	82	0	18	1.0%	1.0%	30	45	0	18	8	4	54.0
7	Leaflet Lane	Flora Vista to Heartnut	587	82	0	18	1.0%	1.0%	30	40	0	14	6	3	52.9
8	Flora Vista Drive	Project Access to Los Alamos	844	82	0	18	1.0%	1.0%	30	40	0	17	8	4	54.5
9	Estancia Drive	Leaflet to Flora Vista	107	82	0	18	1.0%	1.0%	30	40	0	4	2	1	45.5
10	Flora Vista Drive	Estancia to Ester Marie	1,044	82	0	18	1.0%	1.0%	30	40	0	20	9	4	55.4
11	Fox Road	Ester Marie to Tully	1,201	82	0	18	1.0%	1.0%	30	40	0	22	10	5	56.0

### Appendix B-3

#### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 190306

Description: Parkwood Residential - Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Hatch Road	Santa Fe to Tully	12,684	82	0	18	3.0%	2.0%	50	75	0	251	116	54	67.9
2	Tully Road	Hatch to Narcisco	3,798	82	0	18	1.0%	1.0%	30	45	0	47	22	10	60.3
3	Santa Fe Avenue	Hath to Project Access	15,915	82	0	18	3.0%	2.0%	45	100	0	249	116	54	65.9
4	Santa Fe Avenue	Project Access to Los Alamos	15,960	82	0	18	3.0%	2.0%	45	50	-5	249	116	54	65.5
5	Walnut Haven Drive	Heartnut to Tully	473	82	0	18	1.0%	1.0%	30	45	0	12	5	3	51.2
6	Graybark Lane	Heartnut to Tully	768	82	0	18	1.0%	1.0%	30	45	0	16	8	3	53.3
7	Leaflet Lane	Flora Vista to Heartnut	457	82	0	18	1.0%	1.0%	30	40	0	11	5	2	51.8
8	Flora Vista Drive	Project Access to Los Alamos	654	82	0	18	1.0%	1.0%	30	40	0	15	7	3	53.4
9	Estancia Drive	Leaflet to Flora Vista	107	82	0	18	1.0%	1.0%	30	40	0	4	2	1	45.5
10	Flora Vista Drive	Estancia to Ester Marie	914	82	0	18	1.0%	1.0%	30	40	0	18	8	4	54.9
11	Fox Road	Ester Marie to Tully	1,071	82	0	18	1.0%	1.0%	30	40	0	20	9	4	55.5

## Appendix B-4

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 190306

Description: Parkwood Residential - Cumulative + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Hatch Road	Santa Fe to Tully	12,714	82	0	18	3.0%	2.0%	50	75	0	251	117	54	67.9
2	Tully Road	Hatch to Narcisco	3,873	82	0	18	1.0%	1.0%	30	45	0	48	22	10	60.4
3	Santa Fe Avenue	Hath to Project Access	17,685	82	0	18	3.0%	2.0%	45	100	0	267	124	58	66.4
4	Santa Fe Avenue	Project Access to Los Alamos	16,290	82	0	18	3.0%	2.0%	45	50	-5	253	117	54	65.6
5	Walnut Haven Drive	Heartnut to Tully	503	82	0	18	1.0%	1.0%	30	45	0	12	6	3	51.5
6	Graybark Lane	Heartnut to Tully	1,033	82	0	18	1.0%	1.0%	30	45	0	20	9	4	54.6
7	Leaflet Lane	Flora Vista to Heartnut	747	82	0	18	1.0%	1.0%	30	40	0	16	7	3	54.0
8	Flora Vista Drive	Project Access to Los Alamos	1,014	82	0	18	1.0%	1.0%	30	40	0	19	9	4	55.3
9	Estancia Drive	Leaflet to Flora Vista	117	82	0	18	1.0%	1.0%	30	40	0	5	2	1	45.9
10	Flora Vista Drive	Estancia to Ester Marie	1,189	82	0	18	1.0%	1.0%	30	40	0	22	10	5	56.0
11	Fox Road	Ester Marie to Tully	1,346	82	0	18	1.0%	1.0%	30	40	0	23	11	5	56.5

### Appendix C : Barrier Insertion Loss Calculation

#### Project Information:

Project Name: Parkwood Residential  
Location(s): Propsoed SF Residential

#### Noise Level Data:

Source Description: Railroad + Traffic  
Source Noise Level, dBA: 75  
Source Frequency (Hz): 1000  
Source Height (ft): 6

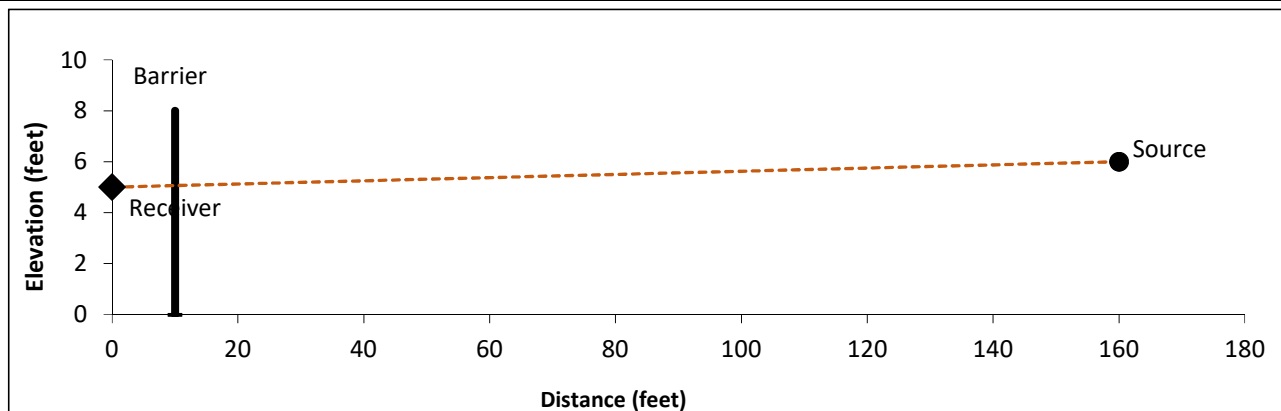
#### Site Geometry:

Receiver Description: Nearest Backyard  
Source to Barrier Distance ( $C_1$ ): 150  
Barrier to Receiver Distance ( $C_2$ ): 10  
Pad/Ground Elevation at Receiver: 0  
Receiver Elevation<sup>1</sup>: 5  
Base of Barrier Elevation: 0  
Starting Barrier Height 8

#### Barrier Effectiveness

Top of Barrier Elevation (ft)	Barrier Height (ft)	Insertion Loss, dB	Noise Level, dB	Barrier Breaks Line of Site to Source?
8	8	-10	65	Yes
9	9	-11	63	Yes
10	10	-13	62	Yes
11	11	-14	61	Yes
12	12	-15	60	Yes
13	13	-15	59	Yes
14	14	-16	59	Yes
15	15	-16	58	Yes
16	16	-17	58	Yes
17	17	-17	57	Yes
18	18	-17	57	Yes

Notes: <sup>1</sup> Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

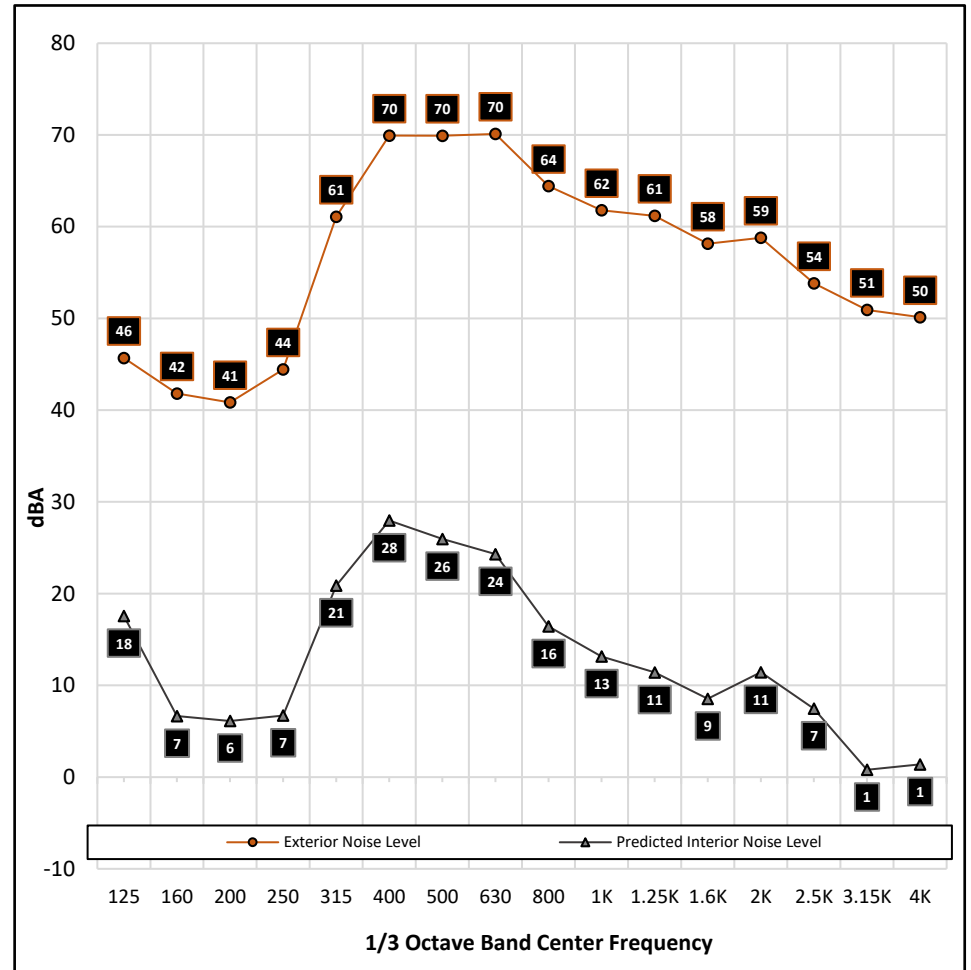




## Appendix D1: Interior Noise Calculation Sheet

**Project:** Parkwood Residential  
**Room Description:** Typical Bedroom - Second Floor

	<u>Inputs</u>	
Parallel Exterior level, dBA:	75	Ldn
Correction Factor, dBA:	0	
Noise Source:	Railroad - Slow, Horns Dominate	
Room Length, ft:	10	
Room Width, ft:	15	
Room Height, ft:	9	
Transmitting Panel Length, ft:	25	
Transmitting Panel Height, ft:	9	
Ceiling Finish:	Gyp Board	
Ceiling, sf:	150	
Wall Finish 1:	Gyp Board	
Wall Finish 1, sf:	420	
Wall Finish 2:	Glass	
Wall Finish 2, sf:	30	
Floor:	Wood	
Floor, sf:	150	
Misc. Finish:	Soft Furnishings	
Misc. Finish, sf:	75	
Transmitting Element 1:	Wall - 0.5" OSB, One Coat Stucco, RC 5/8" gyp	
Element 1, sf:	195	
Transmitting Element 2:	Window - Millgard QuietLine 7220 STC 45a	
Element 2, sf:	30	
Transmitting Element 3:		
Element 3, sf:		
Transmitting Element 4:		
Element 4, sf:		



**Predicted Interior Noise Level, dBA: 32**

\* Calculations based upon common single-family residential floor plans. Actual noise levels may vary based upon proposed floor plans. Specific measures to be verified by acoustic engineer and submitted to City for review.



## Appendix D2: Interior Noise Calculation Sheet

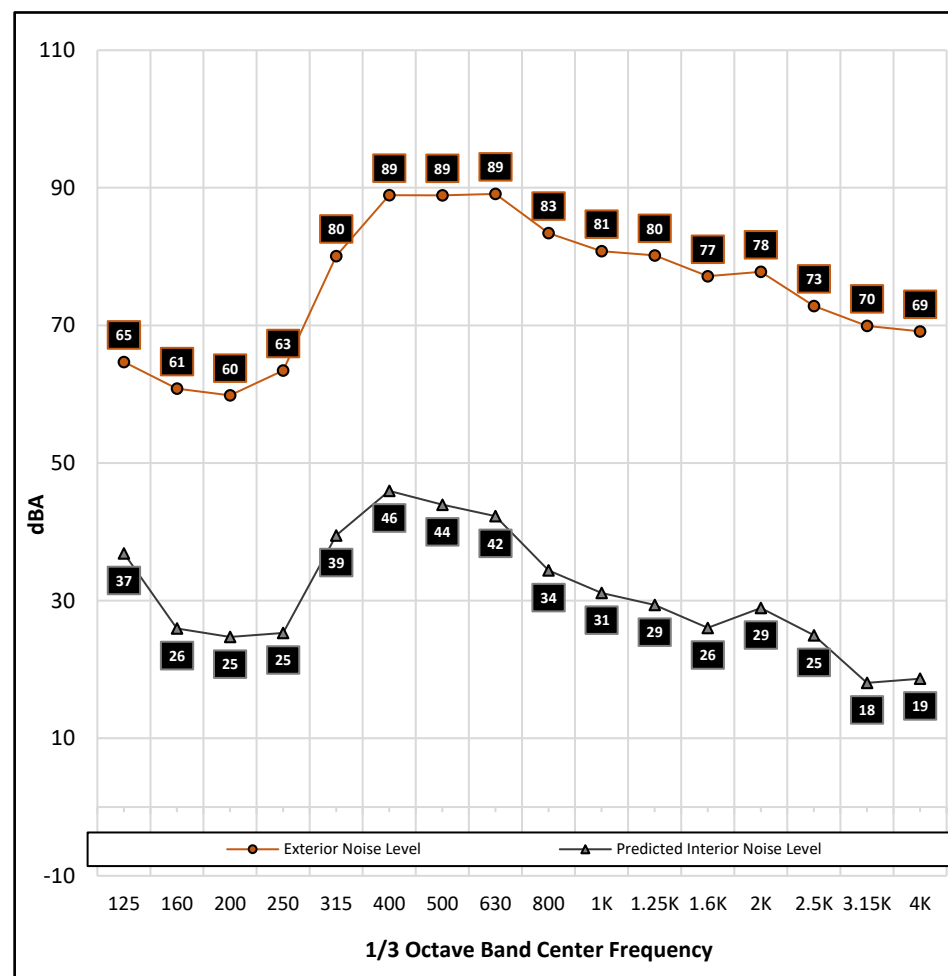
**Project:** Parkwood Residential  
**Room Description:** Typical Bedroom - Second Floor

**Inputs**

Parallel Exterior level, dBA: 94      Lmax  
 Correction Factor, dBA: 0  
 Noise Source: Railroad - Slow, Horns Dominate  
 Room Length, ft: 10  
 Room Width, ft: 15  
 Room Height, ft: 9  
 Transmitting Panel Length, ft: 25  
 Transmitting Panel Height, ft: 9

Ceiling Finish: Gyp Board  
 Ceiling, sf: 150  
 Wall Finish 1: Gyp Board  
 Wall Finish 1, sf: 420  
 Wall Finish 2: Glass  
 Wall Finish 2, sf: 30  
 Floor: Carpet, latex backing on foam pad  
 Floor, sf: 100  
 Misc. Finish: Soft Furnishings  
 Misc. Finish, sf: 75

Transmitting Element 1: Wall - 0.5" OSB, One Coat Stucco, RC 5/8" gyp  
 Element 1, sf: 195  
 Transmitting Element 2: Window - Millgard QuietLine 7220 STC 45a  
 Element 2, sf: 30  
 Transmitting Element 3:  
 Element 3, sf:   
 Transmitting Element 4:  
 Element 4, sf:



**Predicted Interior Noise Level, dBA: 50**

\* Calculations based upon common single-family residential floor plans. Actual noise levels may vary based upon proposed floor plans. Specific measures to be verified by acoustic engineer and submitted to City for review.



## Appendix D3: Interior Noise Calculation Sheet

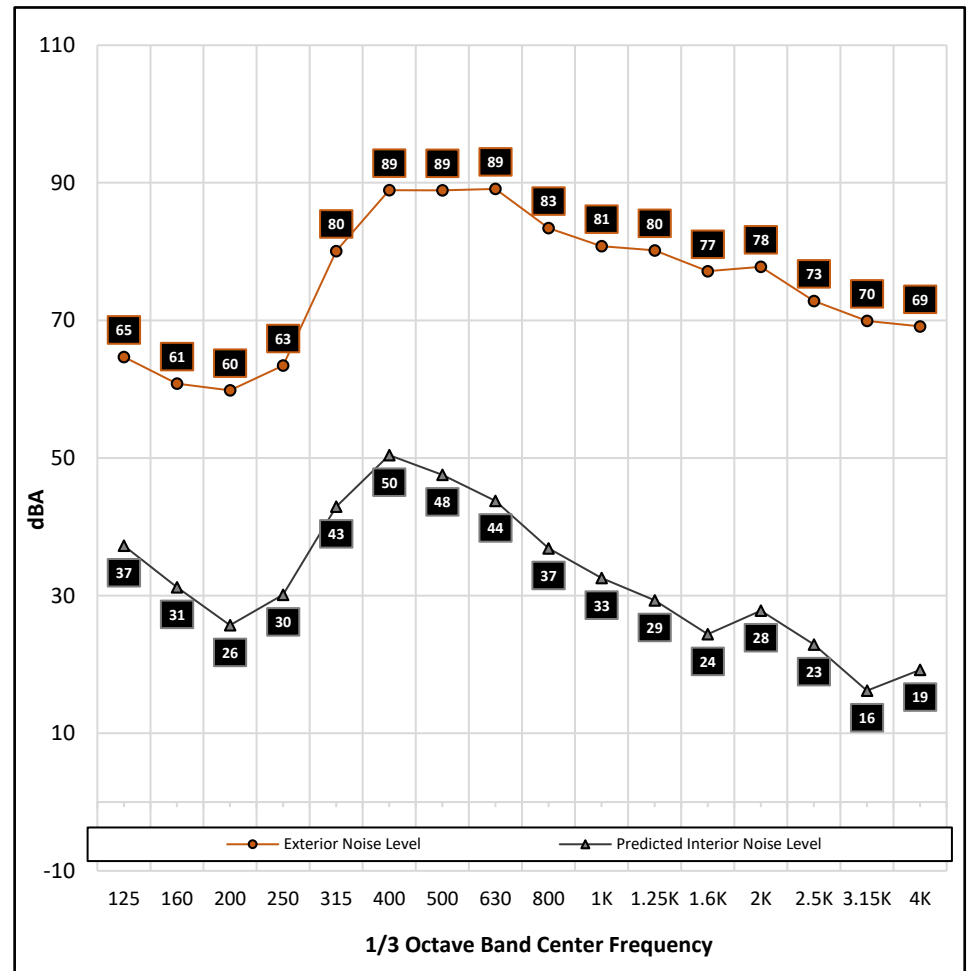
**Project:** Parkwood Residential  
**Room Description:** Typical Room - Second Floor

**Inputs**

Parallel Exterior level, dBA: 94      Lmax  
 Correction Factor, dBA: 0  
 Noise Source: Railroad - Slow, Horns Dominate  
 Room Length, ft: 10  
 Room Width, ft: 15  
 Room Height, ft: 9  
 Transmitting Panel Length, ft: 25  
 Transmitting Panel Height, ft: 9

Ceiling Finish: Gyp Board  
 Ceiling, sf: 150  
 Wall Finish 1: Gyp Board  
 Wall Finish 1, sf: 420  
 Wall Finish 2: Glass  
 Wall Finish 2, sf: 30  
 Floor: Carpet, latex backing on foam pad  
 Floor, sf: 150  
 Misc. Finish: Soft Furnishings  
 Misc. Finish, sf: 100

Transmitting Element 1: Wall - 0.5" OSB, One Coat Stucco, RC 5/8" gyp  
 Element 1, sf: 195  
 Transmitting Element 2: Window - Millgard 7520 Casement STC 40  
 Element 2, sf: 30  
 Transmitting Element 3:  
 Element 3, sf:   
 Transmitting Element 4:  
 Element 4, sf:



**Predicted Interior Noise Level, dBA: 54**

\* Calculations based upon common single-family residential floor plans. Actual noise levels may vary based upon proposed floor plans. Specific measures to be verified by acoustic engineer and submitted to City for review.

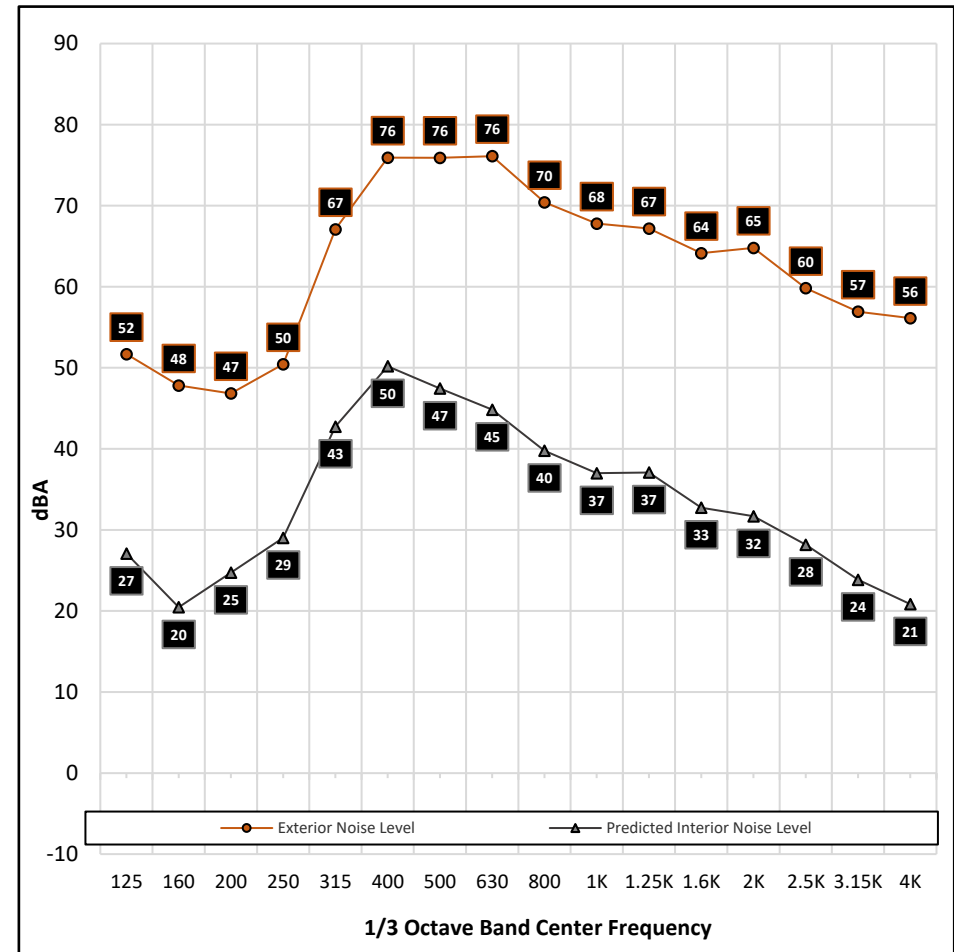


## Appendix D4: Interior Noise Calculation Sheet

**Project:** Parkwood Residential  
**Room Description:** Typical Living Room - First Floor

	<u>Inputs</u>	
Parallel Exterior level, dBA:	81	Lmax
Correction Factor, dBA:	0	
Noise Source:	Railroad - Slow, Horns Dominate	
Room Length, ft:	15	
Room Width, ft:	11	
Room Height, ft:	9	
Transmitting Panel Length, ft:	20	
Transmitting Panel Height, ft:	9	
Ceiling Finish:	Gyp Board	
Ceiling, sf:	165	
Wall Finish 1:	Gyp Board	
Wall Finish 1, sf:	396	
Wall Finish 2:	Glass	
Wall Finish 2, sf:	72	
Floor:	Wood	
Floor, sf:	165	
Misc. Finish:	Soft Furnishings	
Misc. Finish, sf:	25	
Transmitting Element 1:	Wall - 1-Coat Stucco, 5/8" gyp INSUL	
Element 1, sf:	108	
Transmitting Element 2:	Window - Millgard 6610PD Patio Door STC 33	
Element 2, sf:	72	
Transmitting Element 3:		
Element 3, sf:		
Transmitting Element 4:		
Element 4, sf:		

**Predicted Interior Noise Level, dBA: 54**



\* Calculations based upon common single-family residential floor plans. Actual noise levels may vary based upon proposed floor plans. Specific measures to be verified by acoustic engineer and submitted to City for review.

# **Appendix C**

## **Traffic Impact Analysis**

**TRAFFIC IMPACT ANALYSIS**  
**FOR**  
**PARKWOOD SUBDIVISION GPA**  
Hughson, CA

*Prepared For:*

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June 28, 2019

4675-66

Parkwood GPA 6-28-2019.rpt

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*KD Anderson & Associates, Inc.*  
Transportation Engineers

**TRAFFIC IMPACT ANALYSIS FOR  
PARKWOOD SUBDIVISION GPA  
Hughson, CA**

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June 28, 2019



# TRAFFIC IMPACT ANALYSIS FOR PARKWOOD SUBDIVISION GPA Hughson, CA

## INTRODUCTION

This report summarizes **KD Anderson & Associates** analysis of the potential traffic impacts associated with development of the **Parkwood Subdivision General Plan Amendment (GPA)** in Hughson, California. The project will guide development of approximately 56 acres of residential uses on property that is located south of Hatch Road and east of Santa Fe Avenue. The GPA involves conversion of City of Hughson General Plan (GP) Land Use designation on a portion of the site from Commercial to Residential, as well as elimination of one street identified in the GP Circulation Element. The project site is located regionally in Figure 1, and the land use and circulation plan is Figure 2.

The purpose of this analysis is to document current and future traffic conditions in the area of the project and to identify the traffic impacts associated with development of the project in a manner that is consistent with City of Hughson and CEQA guidelines. This report includes evaluation of existing circulation conditions in the area based on Levels of Service associated with current daily and a.m. / p.m. peak hour traffic volumes, and facilities for alternative transportation modes have also been identified. The extent to which circulation system improvements are already needed has been determined. The general characteristics of the proposed project have also been determined based on an analysis of the trip generation that may be associated with proposed land uses. Project trips were assigned to the study area street system, and resulting Levels of Service were compared to current conditions in order to identify the impacts of project development alone.

The cumulative impacts of other development expected under buildout of the Hughson General Plan and continuing regional growth have also been assessed. Because no approved projects remain to be occupied over the near term in Hughson, an analysis of short-term future conditions that assume occupancy of other approved but unconstructed projects was not required. Long term cumulative traffic impacts were evaluated assuming implementation of programmed circulation system improvements and continuing development under the GP using the methods employed for the City of Hughson General Plan Update EIR (GP EIR). Mitigation measures that will be needed to address both project specific and cumulative impacts were identified.

## EXECUTIVE SUMMARY

**Existing Conditions.** The study intersections operate at LOS C or better, which satisfies minimum City of Hughson standards. No location carries volumes that satisfy peak hour traffic signal warrants. Study area roadway segments operate at LOS D or better based on daily traffic volumes and General Plan EIR threshold, which also satisfies the City's minimum standard. While the City has no adopted standard for acceptable traffic volumes on local residential streets, current volumes on the streets south and east of the project fall far below the thresholds commonly employed by other communities.

**Alternative Transportation Modes.** Although pedestrian and bicycle facilities do not exist along the project's Santa Fe Avenue frontage today, sidewalks and bicycle lanes have been constructed in other locations as northern Hughson has been developed. Sidewalks exist on the local streets to the south and east of the project.

**Trip Generation.** The project's 299 residences would be expected to generate 2,823 daily trips with 221 trips in the a.m. peak hour and 296 trips in the p.m. peak hour. As a comparison, site development under the General Plan's current mix of retail and residential designations could result in 8,404 daily, 385 a.m. and 851 p.m. peak hour trips

**Existing Plus Project Alone Impacts.** While development of the project will increase the volume of traffic passing through study area *intersections*, resulting traffic conditions will not exceed the City's minimum LOS D standard. None of the unsignalized intersections will carry traffic volumes that satisfy traffic signal warrants. Thus, the project's impacts are not significant at intersections. The addition of project trips will not result in any *roadway segment* carrying daily volumes in excess of the City of Hughson minimum LOS D goal. The project will add traffic to the local streets south and east of the site, but Parkwood will not result in any local street carrying volumes that exceed the thresholds used by many communities for acceptable levels. The project's impact on roadway segments is not significant.

Facilities for pedestrians and bicyclists are present on the street south and east of the project. Sidewalks will be created along the new streets in the site. The project's Santa Fe Avenue frontage improvements will include sidewalks and accommodate Class 2 Bike Lanes in the future. Thus, facilities will be available for school children to walk to community schools. With these improvements the project's impacts to pedestrian and bicycle travel are not significant, and no additional mitigation is required.

While some residents within the project may create the demand for transit service, assuming the typical modal split achieved in urban areas with transit service (i.e., 1-2% of trips), the number of StarRT riders caused by the project might reach 40 to 80 per day. This demand can be accommodated by current services and would not justify changes to current transit routes. The project's impact to transit is not significant, and mitigation is not required.

**Cumulative Traffic Volumes.** Long term traffic volumes were created with and without the project using the methods originally employed for the Hughson GP EIR. The TRAFFIX local area assignment model created for the GP EIR was modified to reflect development that has occurred since the GPU, and the distribution of future Hughson trips was modified to reflect the elimination of retail center on the project site. The amount of additional regional traffic caused by non-Hughson growth was estimated from the version of the Stanislaus Council of Governments (StanCOG) Tri-County regional travel demand forecasting model that was recently adapted for the City of Ceres General Plan Update.

**Future Roadway Improvements.** The City of Hughson General Plan and other regional planning documents note that circulation system improvements may occur in the future. The Hughson GP EIR suggested that the following improvements would be needed to accommodate General Plan growth:

1. Widening of Santa Fe Avenue to 4 lanes
2. Widening of Hatch Road to 4 lanes
3. Signalization of Hatch Road / Tully Road intersection
4. Signalization of Santa Fe Avenue / Mountain View Drive intersection

The City of Hughson has adopted a fee program to provide a mechanism to allow local development to contribute its fair share to the cost of improvements identified in the GP EIR. The current fee is \$4,101 per dwelling unit.

The *Stanislaus County 2018 Regional Transportation Plan / Sustainable Communities Strategy, Appendix K* presents a list of circulation system improvements anticipated over the long term by the County and local agencies. This project list includes widening Santa Fe Avenue to 3-lanes from Hatch Road to Keyes Road using Measure L funds.

**Cumulative Conditions on Roadway Segments Without the Project.** With or without the Parkwood project **Santa Fe Avenue** will operate at LOS F as a two-lane road. Santa Fe Avenue would need to be widened to provide 4 lanes to satisfy the City's minimum Level of Service standard. This conclusion is consistent with the findings of the GP EIR. A combination of local and regional funds will be needed to improve Santa Fe Avenue, including various funds identified in the 2018 RTP and City of Hughson traffic impact fees.

Without the project, traffic volumes will increase on the local roads south of the site as a result of other Hughson development in the future. The resulting traffic volumes remain well below the minimum LOS threshold and are all below the planning level threshold typically employed by other communities to categorize acceptable traffic volume on local streets (i.e., 2,500 to 4,000 ADT). While the volume may be below applicable thresholds, the cumulative traffic volumes may be perceived by local residents as problematic. The City of Hughson could elect to pursue development of a "neighborhood traffic calming" program to address their concerns. Such a program would identify applicable alternative improvement, such as undulations, vet those improvements with specific neighborhoods, and implement the improvements in response to future conditions.

**Cumulative Plus Project Roadway Segment Impacts.** The project would impact one roadway segment.

**Impact 1.** Santa Fe Avenue will operate at LOS F with and without the project, and the project's impact is cumulatively significant based on its daily volume contribution.

**Discussion.** Santa Fe Avenue will need to be widened to provide four lanes to satisfy the City's minimum Level of Service standard.

**Mitigation.** The Parkwood project will contribute its fair share to the cost of improving Santa Fe Avenue by:

- Installing ½ section improvements along its Santa Fe Avenue frontage that are consistent with the ultimate plan for the roadway.

- Contributing a fair share of the cost of improving Santa Fe Avenue beyond those improvements identified in the 2018 RTP, with applicable credit for paying adopted City of Hughson Traffic Impact Fees

**Impact 2.** The project will contribute to cumulative traffic increases on the local roads south of the site which result as other portions of Hughson development in the future. The resulting traffic volumes will still remain well below the LOS D threshold and are all below the planning level threshold typically employed by communities to categorize acceptable traffic volume on local streets. Thus, the project's impact is not significant, and mitigation is not required.

**Cumulative Intersection Levels of Service without the Project.** If no development occurs on the project site, then two intersections will operate with Level of Service that does not satisfy the City's Minimum LOS D standard, and another location will satisfy peak hour traffic signal warrants.

The **Santa Fe Avenue / Hatch Road intersection** operates at LOS F if no improvements are made. Widening Santa Fe Avenue to provide two through lanes in each direction would deliver LOS D or better conditions. This level of improvement is consistent with the findings of the GP EIR, and widening Santa Fe Avenue to three lanes is identified in the 2018 RTP.

The **Hatch Road / Tully Road intersection** is projected to operate at LOS E, and peak hour traffic signal warrants will be met. A traffic signal is needed to deliver LOS D or better conditions, and this improvement is consistent with the conclusions of the GP EIR.

The **Santa Fe Avenue / Los Alamos intersection** is projected to operate at LOS D but peak hour traffic signal warrants will be met with a two-lane Santa Fe Avenue. The 4-lane widening of Santa Fe Avenue described previously and aimed at improving segment LOS would reduce delays at this location and would result in a condition that doesn't warrant a traffic signal.

**Cumulative Plus Project Intersection Levels of Service / Impacts.** The addition of project trips to cumulative background conditions results in four intersections which will operate with Levels of Service in excess of the City's minimum LOS D standard.

**Impact 3.** The **Santa Fe Avenue / Hatch Road intersection** will operate at LOS F with and without the project. Because conditions exceed the City's minimum standard, the significance of the project's impacts is based on the change in delay. Compared to the No Project condition, the incremental delay increase caused by the project exceeds the significance criteria used for this analysis (i.e., more than 5 seconds). The project's impact is significant, and mitigation is required.

**Discussion 3.** The same improvements noted for the No Project conditions (i.e., two through lanes in each direction on Santa Fe Avenue) will deliver LOS D conditions at the intersection, and the proposed project should contribute its fair share to the cost of this cumulative mitigation. Widening Santa Fe Avenue was addressed under Mitigation 1, and no further mitigation is required.

**Impact 4.** The **Hatch Road / Tully Road intersection** is projected to operate at LOS F with and without the project, and the significance of the project's impact is based on the change in average delay. Because the incremental change caused by the project does not exceed the increment

permitted in this analysis (i.e., 5 seconds), the project's impact is not significant, and direct mitigation is not required.

**Impact 5.** The **Santa Fe Avenue / Project Access intersection** is projected to operate at LOS F with development of the project, and forecast volumes meet traffic signal warrants during the AM peak hour. Because LOS F exceeds the City's minimum standard and traffic signal warrants are satisfied, this is a significant impact that requires mitigation.

**Discussion.** Widening Santa Fe Avenue to four lanes through the intersection will reduce delay on the side street approach but will not result in LOS D. A traffic signal would still be needed. Alternatively, a traffic signal with separate left turn lanes on each approach will deliver LOS D or better conditions without adding additional through lanes on Santa Fe Avenue. A traffic signal is not required under "Existing Plus Project" conditions but will be needed in the future with some combination of project and through traffic.

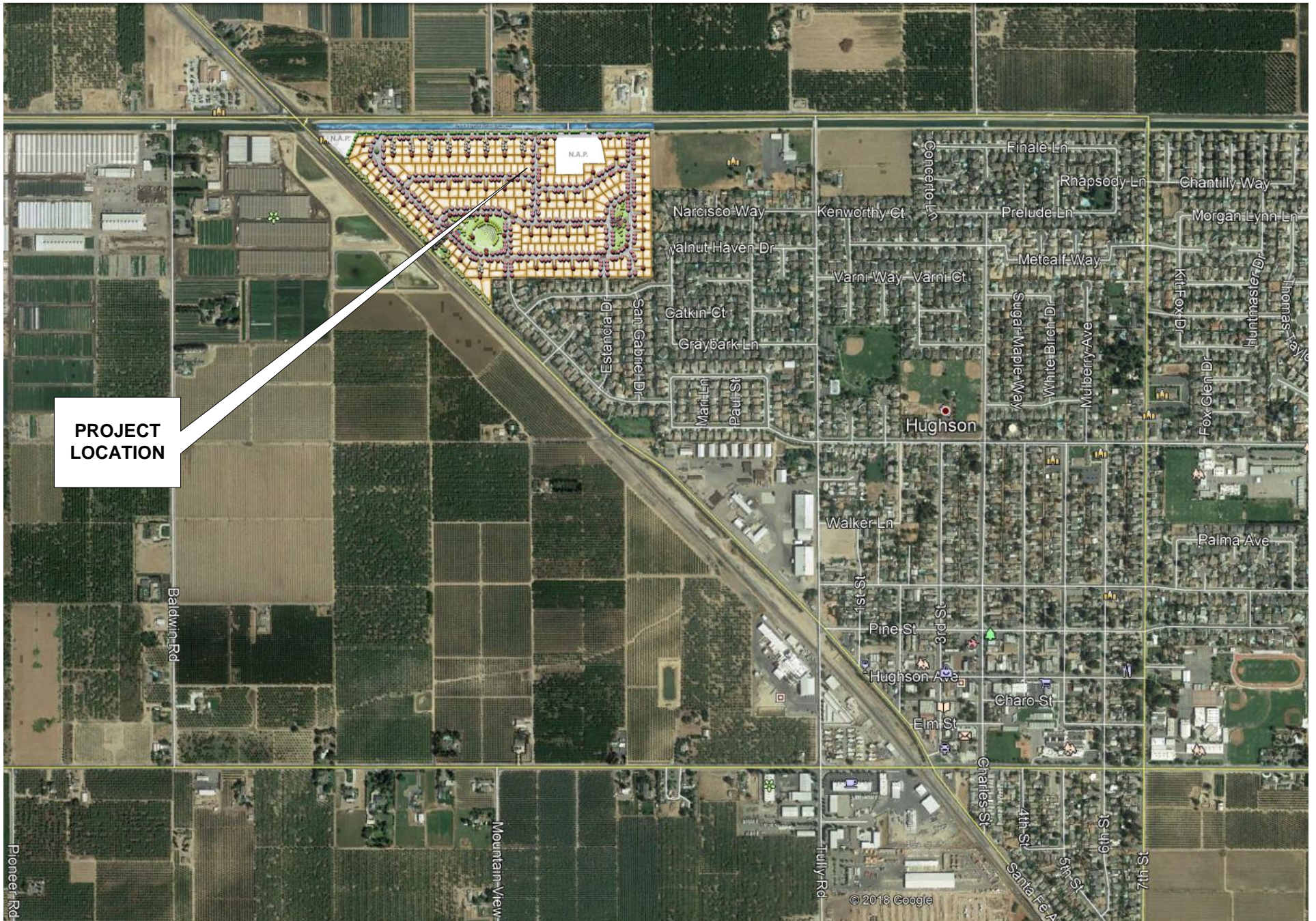
**Mitigation 5.** Because the signal is not immediately needed, the Parkwood project will be required to pay its "fair share" of the cost of a new traffic signal.

**Impact 6.** The **Santa Fe Avenue / Los Alamos Drive intersection** will operate at LOS E with the project in the p.m. peak hour, and peak hour warrants will be satisfied. Because LOS E exceeds the minimum standard and warrants are satisfied this impact is significant and mitigation is required.

**Discussion.** The same improvements (i.e., 4-lane Santa Fe Avenue) described for the No Project condition would yield LOS D or better with the project. Mitigation 1 (widening Santa Fe Avenue) will address this impact, and no additional mitigation is required.

**Fair Share Contribution.** The project's relative share of traffic caused by future regional and Hughson growth has been estimated. The allocation method is taken from Caltrans traffic study guidelines and assumes that only future new traffic will be responsible for contributing to the cost of future improvements. However, recognizing that ½ of each project trip has a destination elsewhere that is also responsible for mitigation the applicable fair share is ½ of the traffic contribution. Fair share calculations are in Table 12 of the report.





VICINITY MAP



## LAND USE DATA

Lot Count : 299 Single Family Residential (SFR) Lots

*Park Home Lot Size: 5,005 - 5,915 sf*

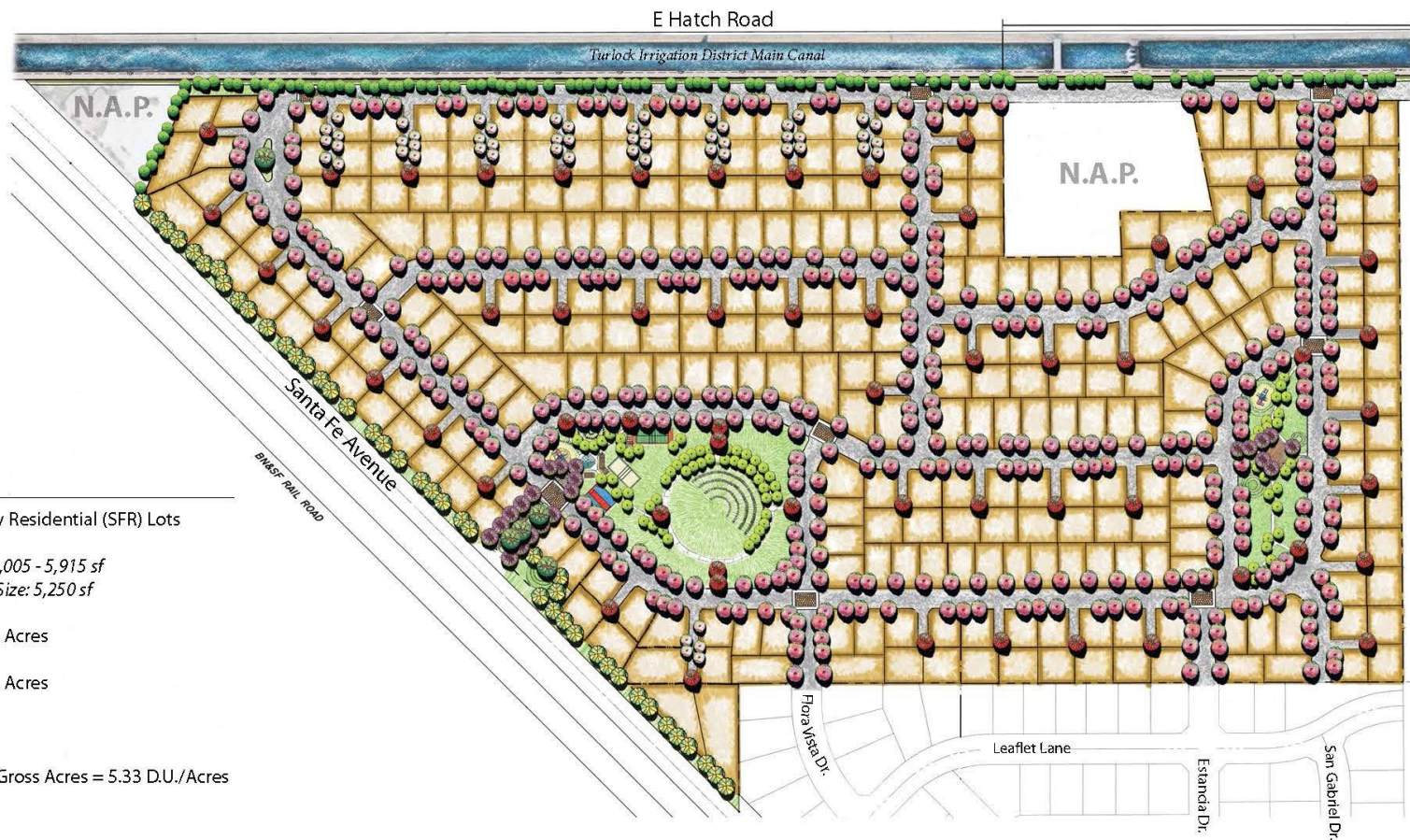
*Courtyard Home Lot Size: 5,250 sf*

Project Acreage: 56.04 Gross Acres

Park/Dual Use Facilities: 4.98 Acres

Density Calculation

299 SFR lots / 56.04 Gross Acres = 5.33 D.U./Acres





## EXISTING SETTING

### Existing Street System

The network of roadways in and around Hughson consists of arterials, collectors and local streets. The closest major highway, State Route 99 (SR 99), is approximately 4.5 miles west of Hughson, where it passes through the community of Ceres, connecting through Modesto and Stockton to points north, and through Merced and Fresno to points south.

Many of Hughson's streets have existed since the earliest days of the City's development. The roadway system is comprised of arterials, collectors and local street; all of which are two-lane with one lane in each direction.

- **Arterials.** Hughson's arterial streets are the primary movers of traffic and provide the primary routes within and through the city, and that also carry traffic to and from the regional highways and other communities. Santa Fe Avenue is an arterial that runs northwest-southeast through Hughson, parallel to the railroad. Santa Fe Avenue's alignment cuts across the orthogonal grid that characterizes Hughson's roadway system, complicating circulation patterns since all roadway intersections with Santa Fe Avenue have a skewed configuration. Intersection improvements along Santa Fe Avenue are also limited due to the presence of the adjoining railroad and canals.

Other existing arterials follow a grid pattern. Geer Road runs north-south along Hughson's eastern Sphere Of Influence (SOI) boundary, ultimately connecting Hughson to Turlock to the south and Oakdale to the north. Hatch Road, Whitmore Avenue and Service Road are east-west arterials that connect Hughson to Ceres and SR-99.

- **Collectors.** The backbone of the City's roadway system consists of its collector streets, which connect arterial streets to local streets. The collector street system is also oriented around a grid. Existing collector streets include Tully Road, Charles Street, 7<sup>th</sup> Street and Euclid Avenue, which run north-south, Fox Road and Hughson Avenue, which run east-west.
- **Local Streets.** The remainder of Hughson's roadways are considered local streets that serve to connect vehicles from individual neighborhoods to the collector system. In some of the City's southern portions, older streets were developed based on previous County standards and have substandard and potentially dangerous intersections with adjoining arterials. Local streets in newer residential subdivisions are generally oriented around cul-de-sacs and non-direct through streets that lack the connectivity of Hughson's older neighborhoods. In the area of the project, local streets of importance include Walnut Haven Drive, Graybark Lane, Leaflet Lane, Flora Vista Drive and Estancia Drive.

## **Study Intersections**

In urban areas the flow of traffic is often governed by the operation of intersections. The northern Hughson intersections identified for evaluation by City staff include the following locations:

- Santa Fe Avenue / Hatch Road
- Hatch Road / Tully Road
- Santa Fe Avenue / Los Alamos Drive
- Tully Road / Fox Road

The text which follows describes the configuration and controls of study area intersections.

The **Santa Fe Avenue / Hatch Road intersection** is controlled by a traffic signal. All intersection legs have a single through travel lane and a separate left turn lane. Separate right turn lanes are available on the eastbound Hatch Road and southbound Santa Fe Avenue approaches. The intersection adjoins the BN&SF railroad, and the west Hatch Road leg crosses the railroad. As a result, the stop bar on the eastbound approach has been moved westerly beyond the railroad tracks to ensure that the tracks will be clear when a train approaches. There are no crosswalks striped at this intersection.

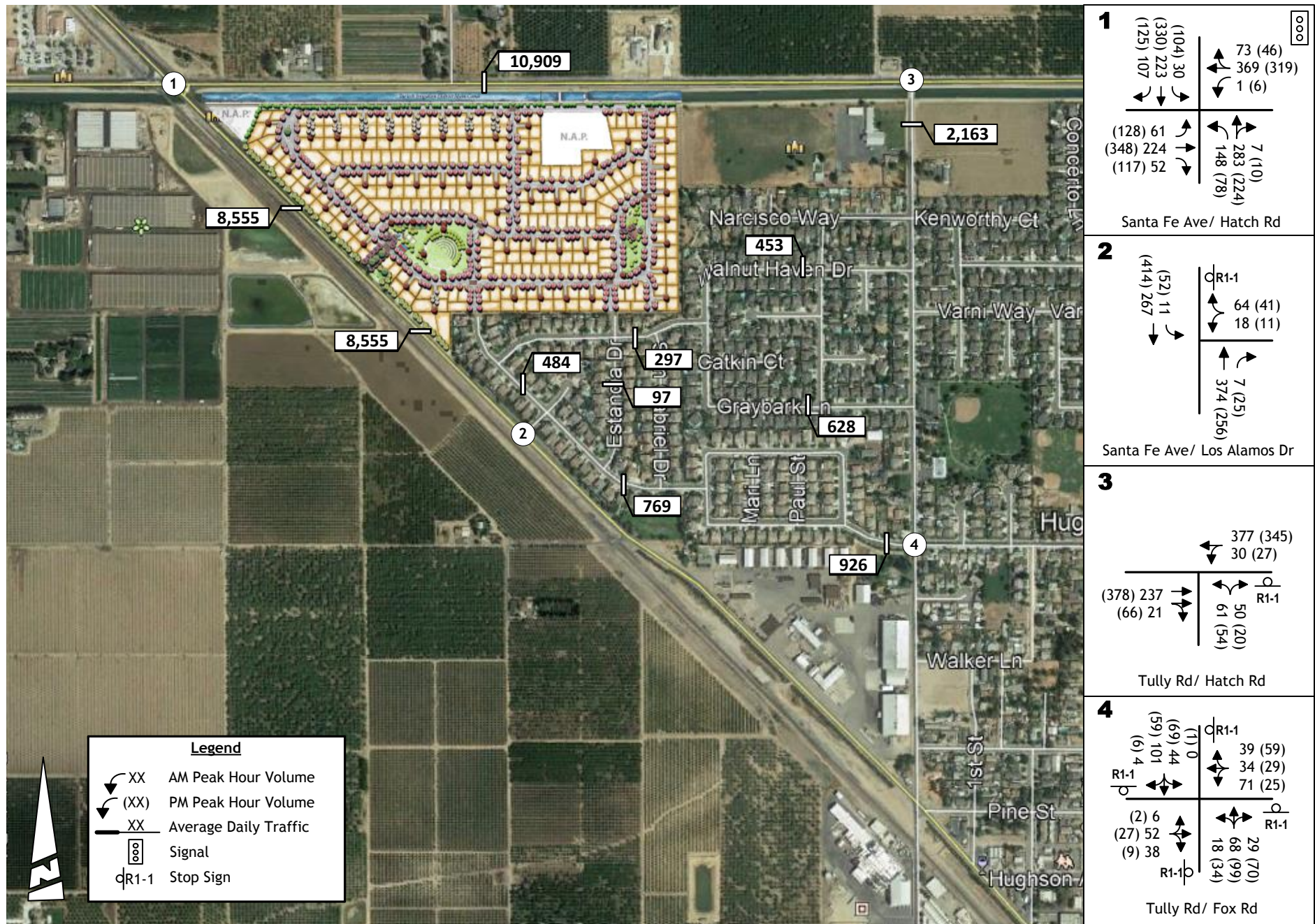
The **Hatch Road / Tully Road intersection** is a “tee” controlled by a stop sign on the northbound Tully Road approach across a canal. Each approach has a single through travel lane, and a separate left turn lane is striped on westbound Hatch Road. There are no crosswalks or sidewalks at the intersection.

The **Santa Fe Avenue / Los Alamos Drive intersection** is a “tee” controlled by a stop sign on the westbound Los Alamos Drive approach. A southbound left turn lane exists on Santa Fe Avenue, and a corresponding “merge lane” accommodates left turns from Los Alamos Drive onto southbound Santa Fe avenue. A separate northbound right turn lane also exists on Santa Fe Avenue. There are no crosswalks at the intersection but sidewalks exist on the east side of the intersection.

The **Tully Road / Fox Road intersection** is controlled by an all-way stop. Each approach is a single lane. While there are no striped crosswalks, each corner has sidewalk and handicap ramps.

## **Existing Traffic Volumes**

To quantify existing traffic conditions, a base of current daily and peak hour traffic volume information was assembled from new traffic counts completed by the consultant. New traffic counts were made at most locations on March 19, 2019 when area schools were in session. The study intersections were noted in Figure 3, and applicable a.m. and p.m. peak hour traffic counts are also presented on Figure 3. Current information regarding the number of lanes and traffic control devices are also presented.





## **Level of Service Calculation**

To quantitatively evaluate traffic conditions and to provide a basis for comparison of operating conditions with and without project generated traffic, Levels of Service were determined at study area intersections and roadway segments.

“Level of Service” (LOS) is a quantitative measure of traffic operating conditions whereby a letter grade “A” through “F” is assigned to an intersection. LOS “A” through “F” represents progressively worsening traffic conditions. The characteristics associated with the various LOS for intersections are presented in Table 1. The City of Hughson has identified LOS D as the minimum standard for all roadways and intersections.

**Intersection Levels of Service Methodology.** Levels of Service were calculated for this study using the methodology contained in the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM) using Synchro 10.0 software. The overall Level of Service for intersections was determined based on the average length of delays for all motorists at signalized intersections and all-way stop controlled intersections. At un-signalized intersections controlled by side-street stop signs the reported Level of Service is that associated with the “worst case”.

<b>TABLE 1 LEVEL OF SERVICE DEFINITIONS</b>			
<b>Level of Service</b>	<b>Signalized Intersection</b>	<b>Unsignalized Intersection</b>	<b>Roadway (Daily)</b>
“A”	Uncongested operations, all queues clear in a single-signal cycle. Delay $\leq 10.0$ sec	Little or no delay. Delay $\leq 10$ sec/veh	Completely free flow.
“B”	Uncongested operations, all queues clear in a single cycle. Delay $> 10.0$ sec and $\leq 20.0$ sec	Short traffic delays. Delay $> 10$ sec/veh and $\leq 15$ sec/veh	Free flow, presence of other vehicles noticeable.
“C”	Light congestion, occasional backups on critical approaches. Delay $> 20.0$ sec and $\leq 35.0$ sec	Average traffic delays. Delay $> 15$ sec/veh and $\leq 25$ sec/veh	Ability to maneuver and select operating speed affected.
“D”	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay $> 35.0$ sec and $\leq 55.0$ sec	Long traffic delays. Delay $> 25$ sec/veh and $\leq 35$ sec/veh	Unstable flow, speeds and ability to maneuver restricted.
“E”	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay $> 55.0$ sec and $\leq 80.0$ sec	Very long traffic delays, failure, extreme congestion. Delay $> 35$ sec/veh and $\leq 50$ sec/veh	At or near capacity, flow quite unstable.
“F”	Total breakdown, stop-and-go operation. Delay $> 80.0$ sec	Intersection blocked by external causes. Delay $> 50$ sec/veh	Forced flow, breakdown.
Sources: <u>Highway Capacity Manual, 6<sup>th</sup> Edition.</u>			

**Roadway Segment Levels of Service.** The Level of Service on individual roadway segments was determined based on daily traffic volume thresholds identified in the City of Hughson General Plan Update - Existing Conditions report. Volume / capacity thresholds for urban streets presented in the Highway Capacity Manual (1985) were employed, and resulting thresholds specific to roadway type are presented in Table 2.

<b>TABLE 2 GENERAL LEVEL OF SERVICE THRESHOLDS BASED ON DAILY TRAFFIC VOLUMES</b>					
Street Classification	Lanes	Control	Daily Traffic Volume at LOS		
			C	D	E
Collector	2	undivided	7,700	11,600	12,900
Arterial	2	undivided	9,200	13,700	15,450
	4	divided	20,100	30,200	33,200

### **Current Traffic Conditions / Levels of Service**

**Intersection Level of Service.** Current a.m. and p.m. peak hour Levels of Service were calculated at existing study intersections (Refer to Appendix for calculation worksheets) under “Existing” conditions, and the results are presented in Table 3. In each case the observed Peak Hour Factor (PHF) has been employed to describe conditions occurring during the peak 15 minutes within each hour.

As shown, all study area intersections operate at LOS C or better, which satisfies minimum Levels of Service under City of Hughson standards.

**Traffic Signal Warrants.** The extent to which current traffic conditions at un-signalized intersections might justify a traffic signal was evaluated based on the warrants contained in the Manual of Uniform Traffic Control Devices. Today the volume of traffic occurring at the unsignalized study intersections does not satisfy Warrant 3 (peak hour warrants).

TABLE 3 EXISTING INTERSECTION LEVEL OF SERVICE					
Intersection	Control	AM Peak Hour		PM Peak Hour	
		Existing		Existing	
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)
Santa Fe Ave / Hatch Rd	Signal	C	34.2	C	33.8
Santa Fe Ave / Los Alamos Dr Westbound approach	WB Stop	A	12.8	B	11.8
Tully Rd / Hatch Rd Northbound approach	NB Stop	C	15.2	C	18.3
Tully Rd / Fox Rd	All-Way Stop	A	9.4	A	8.7
Santa Fe Ave/ West Project Access Westbound approach	WB Stop	--	--	--	--
<b>Bold</b> indicates conditions in excess of adopted LOS D standard <b>Highlighted</b> values are a significant impact					

**Roadway Segment Levels of Service based on Daily Traffic Volumes.** The daily traffic volumes observed on study area roads are noted in Table 4. For comparison, the table also presents traffic volumes collected 15 years ago when the GP Update EIR was prepared. As indicated, today all arterial and collector roads carry volumes that satisfy the City of Hughson's minimum LOS D standard. As indicated, the current daily traffic volumes are only slightly changed from those collected in 2004. The volume on Hatch Road is only 4% higher, while the volume on Santa Fe Avenue has increased by 10%. The volume on Tully Road has dropped slightly.

The daily volumes on local streets in the area immediately south of the project would be indicative of LOS C conditions if the City's LOS thresholds for collector streets were applied to local streets. It is important to note, however, that in many communities the residents living along local streets begin to complain of the effects of increased traffic at volume levels far below the actual traffic capacity of the street. Driveway access, noise and pedestrian conflicts are common complaints, rather than delay at intersections. While the City of Hughson has not adopted guidelines for acceptable traffic volume on local streets, many other communities have determined that 2,500 to 4,000 vehicles per day represent the desirable maximum volume for local streets. In this case, all the local streets addressed herein carry volumes that are below that level, which suggests that current conditions can be judged to be acceptable.

**TABLE 4  
CURRENT ROADWAY SEGMENT LEVEL OF SERVICE  
BASED ON DAILY TRAFFIC VOLUME**

Roadway	Location	Classification	Lanes	Daily Volume	LOS
				2004 / 2019	
Hatch Road	Santa Fe Avenue to Tully Road	Arterial	2	10,525/10,909	D
Tully Road	Hatch Road to Narcisco Way	Collector	2	2,251/2,163	C
Santa Fe Avenue	Hatch Road to Los Alamos Dr	Arterial	2	7,764/8,555	C
Walnut Haven Dr	Heartnut Way to Tully Road	Local	2	453	C <sup>1</sup>
Graybark Lane	Heartnut Way to Tully Road	Local	2	628	C <sup>1</sup>
Leaflet Lane	Flora Vista Dr to Heartnut Way	Local	2	297	C <sup>1</sup>
Flora Vista Drive	Project to Los Alamos Dr	Local	2	484	C <sup>1</sup>
Estancia Drive	Leaflet Lane to Flora Vista Dr	Local	2	97	C <sup>1</sup>
Flora Vista Drive	Estancia Dr to Ester Marie Ave	Local	2	769	C <sup>1</sup>
Fox Road	Ester Marie Ave to Tully Road	Local	2	926	C <sup>1</sup>
<b>Bold</b> values exceed the minimum LOS D standard.					
<sup>1</sup> based on two-lane collector thresholds					

### **Pedestrian / Bicycle Facilities**

Although pedestrian and bicycle facilities do not exist along the project's Santa Fe Avenue frontage today, sidewalks and bicycle lanes have been constructed in other locations as northern Hughson has been developed. Sidewalk exists on the local streets to the south and east of the project.

Bicycle facilities are limited in Hughson. The City's Non-motorized Transportation Plan (NMTP) indicates where facilities may be developed in the future.

Chapter 1000 of the Caltrans *Highway Design Manual* defines three classes of bicycle facilities and details the minimum requirements for those facility types:

- Class 1 Bicycle Paths - a paved right of way completely separated from any street or highway.
- Class 2 Bicycle Lanes - a striped and stenciled lane for one-way travel on a street or highway.
- Class 3 Bicycle Routes - a typical roadway identified as a preferred bicycle route with signage. They may also include shared use lane markings, "SHARE THE ROAD" signage, or wide shoulders.



The NMTP indicates that a Class 1 trail may be developed on Hatch Road in the future and that Class 2 Bicycle Lanes may be developed on Santa Fe Avenue, on Fox Road east of Tully Road and on Tully Road south of Fox Road. Class 3 bicycles routes are planned on Flora Vista Drive and on Tully Road north of Fox Road.

### **Transit Facilities**

The Hughson area is served by Stanislaus Regional Transit (StaRT). Route 61 links the rural communities of Empire, Waterford, and Hughson with Ceres and with the Transportation Center in Modesto. Route 61 operates Monday through Friday between 6:15 a.m. and 7:45 p.m. with reduced hours on Saturday. This route generally follows Whitmore Avenue through Hughson with a two designated stops at Hughson Avenue & 3<sup>rd</sup> Street and at Whitmore Avenue & Tully Road.

## PROJECT CHARACTERISTICS

### Trip Generation

The amount of traffic generated by development of the project has been estimated based on the trip generation characteristics of planned uses. Table 5 presents the trip generation rates employed for this analysis. Rates for residential uses were drawn from the *Institute of Transportation Engineers (ITE)* publication *Trip Generation, 10th Edition*.

As indicated, the standard ITE rate for single family residences has been selected for the project. The rate that is applicable to development under the current GP land use commercial category has also been noted.

TABLE 5 TRIP GENERATION RATES								
Land Use	Unit	Trip Per Unit						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single Family Residential	dwelling	9.44	0.19	0.56	0.74	0.63	0.36	0.99
General Commercial	ksf	37.75	0.58	0.37	0.95	1.83	1.98	3.81
Source: Institute of Transportation Engineers, <i>Trip Generation manual, 10<sup>th</sup> Edition</i>								

As shown in Table 6, the project's 299 residences would be expected to generate 2,823 daily trips with 221 trips in the a.m. peak hour and 296 trips in the p.m. peak hour.

Under the current GP land use designations this site could be occupied by 19 acres of commercial development and 37 acres of single family residential. The GP EIR assumed that this commercial area would be developed with retail shopping, and at the standard Floor Area Ratio (FAR) for retail centers (i.e., 0.25), roughly 207 ksf of retail space would be expected. Combined with the adjoining retail space, the GP Uses could generate gross totals of 11,061 daily trips, with 452 trips in the a.m. peak hour and 1,119 trips in the p.m. peak hour. After discount for retail pass by trips, the net new totals for the GP designations are 8,404 daily, 351 a.m. and 851 p.m. peak hour trips.

TABLE 6 PARKWOOD SUBDIVISION GPA TRIP GENERATION								
Land Use	Quantity	Trips						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
New Development in Parkwood								
SF Residential (LDR)	99 du's	935	18	55	73	62	36	98
SF Residential (MDR)	200 du's	1,888	37	111	148	124	74	198
New Development Subtotal		2,823	55	166	221	186	110	296
Site Development Under Current GP Designations								
Service Commercial 19 acres @ .25 FAR	207 ksf	7,814	122	75	197	379	409	788
Pass by trips	34%	2,657	34	33	67	134	134	268
Net new trips		5,157	88	42	130	245	275	520
SF Residential (LDR)	96 du's	906	18	53	71	60	35	95
SF Residential (MDR)	248 DU'S	2,341	46	138	184	148	88	236
GP Development - Total		11,061	186	266	452	587	532	1,119
GP Development – Net New		8,404	152	233	385	453	398	851

### **Planned Improvements**

Consistent with City policy development in the project will be required to install frontage improvements as development occurs. This will include the widening of Santa Fe Avenue to ½ of its ultimate section. The project's internal street system will be constructed, including extensions of Flora Vista Drive and Estancia Drive into the site. In addition, the project will include a stub at its northern corner that will allow a future extension by others to Narcisco Drive.

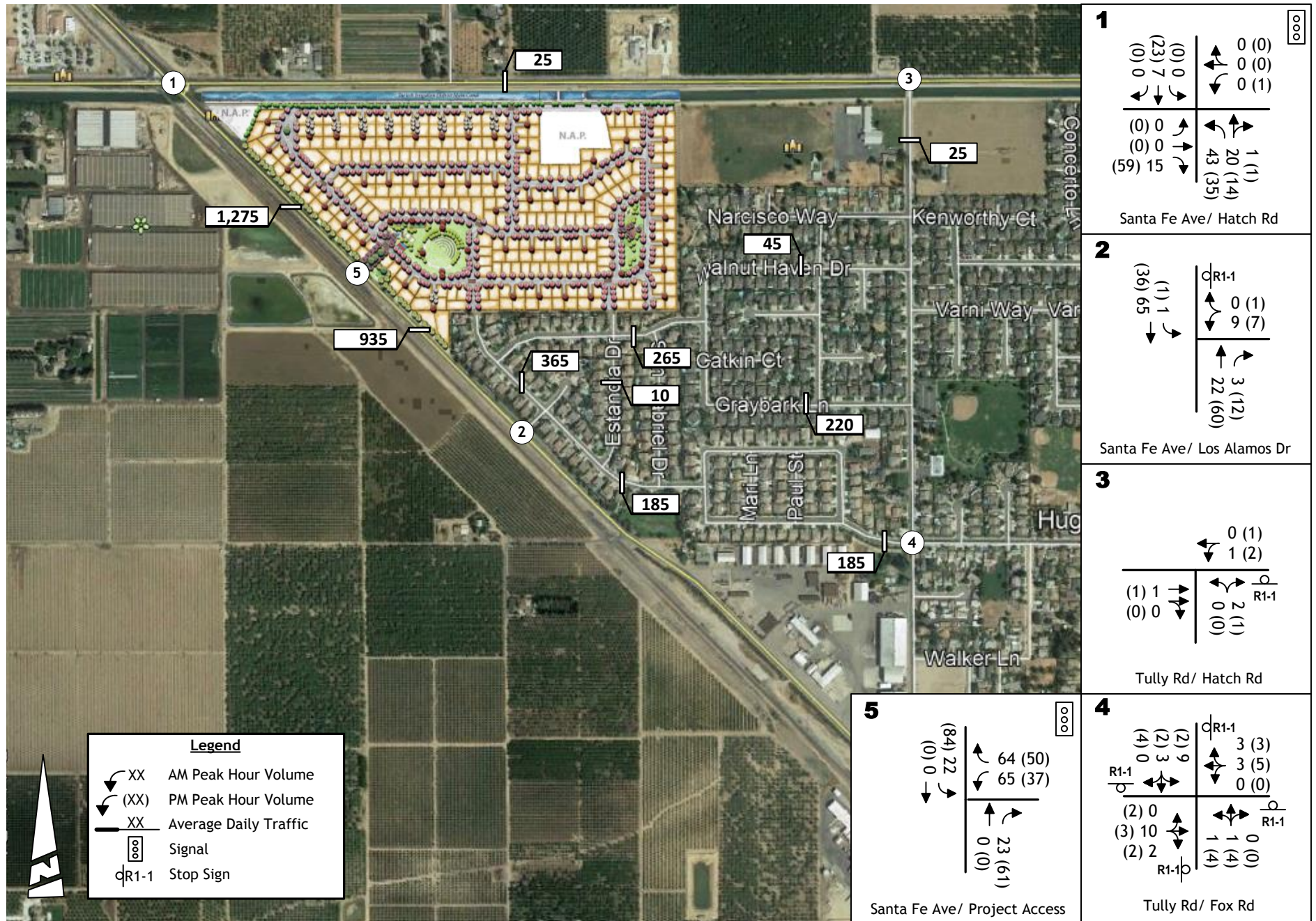
### **Trip Distribution and Assignment**

**Distribution.** The regional distribution of the new trips generated by the project will reflect the project's location on the east end of the urbanized Hughson area. The distribution of project trips has been determined from review of existing local traffic patterns as well as consideration of traffic patterns suggested by the City of Hughson General Plan Update traffic model. The distribution pattern identified in the GP EIR for new residential area under cumulative conditions was adjusted to reflect the elimination of a portion of the community's Service Commercial land use. The GP EIR distribution was further reduced to represent short term conditions based on the location of existing retail and employment in Ceres, Modesto and Turlock.

The relationship between new residential development and Hughson schools has been considered in developing the a.m. peak hour distribution assumptions. Many parents will elect to drop off students before continuing on as part of a commute trip. Because area schools lie generally to the east, the share of project trips using local roads to the east will be higher in the a.m. peak hour than in the p.m.

**Trip Assignment.** Project trips were assigned to the local area street system under the distribution assumptions presented above with the access assumptions described previously based on the “least time path” available from various locations within the Hughson area. The resulting “project only” trip assignment for residentially generated traffic alone is presented in Figure 4.





## **REGULATORY SETTING**

### **City of Hughson General Plan**

The City of Hughson General Plan Circulation Element identifies policies related to transportation and traffic standards.

### **City of Hughson Non-Motorized Transportation Plan**

The City of Hughson adopted the Non-Motorized Transportation Plan in 2008 to guide the development of pedestrian and bicycle facilities.

### **Standards of Significance**

For this analysis, the proposed project would have a significant impact to transportation and traffic if the project would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in Level of Service), either during the plus project condition, or the cumulative plus project condition.
- Exceed, either individually or cumulatively, a Level of Service standard established by the City of Hughson designated roads or highways.

**Roadways/Signalized Intersections:** The project is considered to have a significant effect if it would:

- Cause deterioration of an intersection from LOS D on arterial and collector streets and intersections to LOS E or LOS F.
- The City of Hughson has not established criteria for locations where background conditions already exceed or are forecast to exceed LOS D. For this analysis the criteria adopted by Stanislaus County, and by the Cities of Ceres, Modesto and Turlock have been considered. A traffic impact is significant if it causes an increase in average delay of 5 or more seconds for a signalized intersection operating at LOS E or LOS F under Baseline (No Project) conditions, or increases the daily traffic volume by 5% on a road that is already operating at LOS E or F.
- At unsignalized intersections an impact is significant if it causes deterioration of a controlled movement at an un-signalized intersection from LOS D (or better) to LOS E or LOS F, or at intersections where a controlled movement already operates at LOS E or F, if the following criteria are met:

1. Project traffic results in satisfaction at the peak hour volume traffic signal warrant, and;
2. Project traffic increases a minor movement delay by more than 5 seconds; or
3. Where the peak hour signal warrant is met without the project traffic and delay cannot be estimated by HCM methods, the project increases traffic by 10 or more vehicles per lane on the controlled approach during the peak hour.

### **Existing Plus Project Levels of Service**

The peak hour Levels of Service occurring at study area intersections and Level of Service on roadway segments based on daily volume with development of the project have been evaluated.

**Roadway Segment Level of Service.** As noted in Table 7, the addition of project trips will not result in any location carrying daily volumes in excess of the City of Hughson minimum LOS D goal. Thus, the project's impact is not significant based on that metric.

The project will add traffic to the local streets south and east of the site. While not an adopted significance criterion, in comparison to the planning level daily volume thresholds typically employed by other communities Parkwood will not result in any local street carrying volumes that exceed an acceptable level.

**Level of Service at Intersections.** Projected peak hour traffic volumes have been used to project Levels of Service with completion of the project. Figure 5 presents "Existing Plus project" volumes. Table 8 compares "Existing" and "Existing plus Project" Levels of Service based on those volumes.

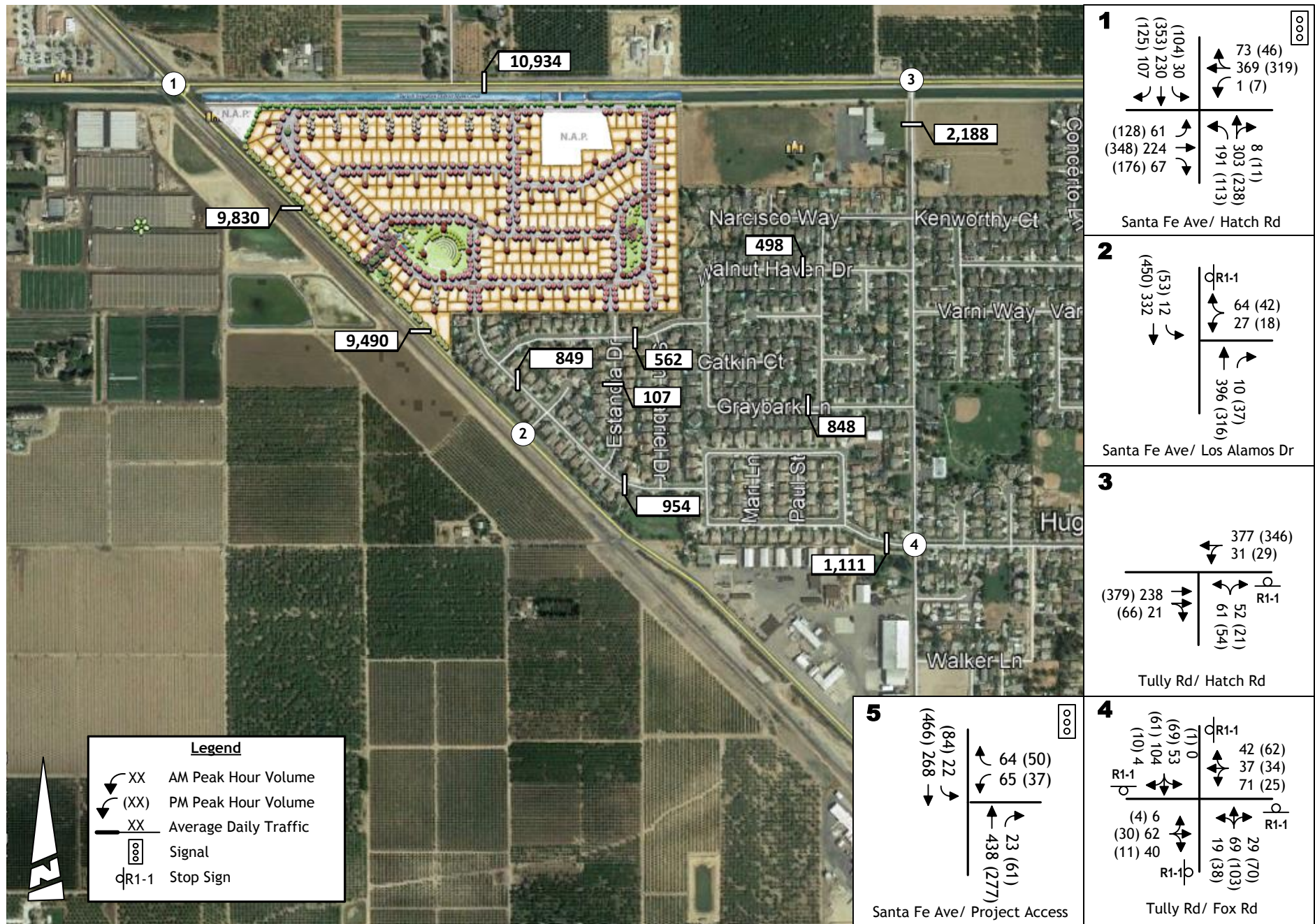
As shown, while development of the project will increase the volume of traffic passing through study area intersections, resulting traffic conditions will not exceed the City's minimum LOS D standard. Thus, the project's impacts are not significant under this criteria.

**Traffic Signal Warrants.** Project traffic volumes have been compared to MUTCD peak hour warrants. None of the unsignalized intersections carry traffic volumes that satisfy traffic signal warrants.

**Pedestrian and Bicycle Facility Impacts.** As noted under the discussion of existing conditions, facilities for pedestrians and bicyclists are present on the street south and east of the project. Sidewalks will be created along the new streets in the site. Thus facilities will be available for school children to walk to community schools. The project's Santa Fe Avenue frontage improvements include sidewalks and will accommodate Class 2 Bike Lanes. With these improvements the project's impacts to pedestrian and bicycle travel are not significant.

**Transit Impacts.** The residents within the project may create the demand for transit services as an alternative to the private automobile. However, assuming the typical modal split achieved in urban areas with transit service (i.e., 1-2% of trips), the number of project StarRT riders might reach 40 to 80 per day. This demand can be accommodated by current services and would not justify changes to current transit routes. The project's impact to transit is not significant, and mitigation is not required.





**TABLE 7  
LEVEL OF SERVICE DAILY TRAFFIC VOLUMES EXISTING PLUS PROJECT**

Roadway	Location	Classification	Lanes	Existing		Existing Plus Project		
				Daily Volume	LOS	Daily Volume		LOS
						Project Only	Total	
Hatch Road	Santa Fe Ave to Tully Rd	Arterial	2	10,909	D	25	10,934	D
Tully Road	Hatch Rd to Narcisco Way	Collector	2	2,163	C	25	2,188	C
Santa Fe Avenue	Hatch Rd to Project Access	Arterial	2	8,555	C	1,275	9,830	D
Santa Fe Avenue	Project Access to Los Alamos	Arterial	2	8,555	C	935	9,490	D
Walnut Haven Drive	Heartnut Way to Tully Rd	Local	2	453	C	45	498	C
Graybark Lane	Heartnut Way to Tully Rd	Local	2	628	C	221	848	C
Leaflet Lane	Flora Vista Dr to Heartnut Way	Local	2	297	C	265	562	C
Flora Vista Drive	Project to Los Alamos Dr	Local	2	484	C	365	849	C
Estancia Drive	Leaflet Ln to Flora Vista Dr	Local	2	97	C	10	107	C
Flora Vista Drive	Estancia Dr to Ester Marie Ave	Local	2	769	C	185	954	C
Fox Road	Ester Marie Ave to Tully Rd	Collector	2	926	C	185	1,111	C

**Bold** indicates conditions in excess of adopted minimum standard      **Highlighted** values are a significant impact

**TABLE 8  
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE**

Intersection	Control	AM Peak Hour				PM Peak Hour				Signal Warrant Met?
		Existing		Existing Plus Project		Existing		Existing Plus Project		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
Santa Fe Ave / Hatch Rd	Signal	C	34.2	D	45.4	C	33.8	D	38.7	--
Santa Fe Ave / Los Alamos Dr Westbound approach	WB Stop	A	12.8	B	14.3	B	11.8	B	13.7	No
Tully Rd / Hatch Rd Northbound approach	NB Stop	C	15.2	C	15.2	C	18.3	C	18.5	No
Tully Rd/ Fox Rd	All Way Stop	A	9.4	A	9.7	A	8.7	A	8.9	No
Santa Fe Ave/ West Project Access Westbound approach	WB Stop	--	--	C	17.8	--	--	C	17.6	No

**Bold** indicates conditions in excess of adopted LOS D standard      **Highlighted** values are a significant impact

## CUMULATIVE TRAFFIC IMPACTS

This report section considers the impacts of the project within the context of long term traffic conditions that may accompany the development of regional circulation system improvements, regional development and non-project land use assumed with implementation of the City of Hughson General Plan Update. To evaluate the impacts of the project on future traffic conditions in the project area cumulative traffic volumes with and without the project (i.e. no site development) were identified and assessed.

### Approach to Using Hughson GPU Traffic Model

A two-step approach was taken for the Hughson GPA EIR traffic study, and that approach was repeated for this analysis. To account for immediate Hughson area development the TRAFFIX local area assignment model created for the GP EIR was re-used. That model identified the trip generation associated with new land use at buildout of the General Plan and assigned that traffic to study area streets. For this analysis development that has occurred during the time between the GPU EIR traffic analysis and the date of the new traffic counts was no longer assumed to create additional trips. Because that model does not directly account for regional non-Hughson growth, the amount of through traffic growth on Hatch Road and Santa Fe Avenue needs to be determined. Applicable regional traffic models were reviewed. The version of the Stanislaus Council of Governments (StanCOG) Tri-County regional travel demand forecasting model that was recently adapted for the City of Ceres General Plan Update was selected after comparison to the original StanCOG Tri-County model and the traffic model created for the North County Corridor EIR.

**Methodology.** The original Hughson GP TRAFFIX assignment model was reviewed, and appropriate changes were made to account for the development that occurred since the GPU was prepared and to reflect the proposed project. Those changes included modifications to local – regional trip distribution assumptions caused by elimination of commercial land use and elimination of travel via the previously planned Mountain View Drive extension to Santa Fe Avenue. The extension from Hatch Road to Santa Fe Avenue through the project site is no longer a part of area development and will be eliminated from the Circulation Element if the Parkwood project is approved .

To address through traffic unrelated to Hughson growth, an “incremental approach” was taken to use the traffic model to create road segment volumes that best account for inherent limitations of a regional traffic model. The model’s 2040 run results were compared to the GPA model’s Year 2015 calibrated baseline year forecasts and the incremental difference in segment volume was identified. These volumes were added to the sum of observed Year 2019 volumes and trips associated with Hughson growth to create the final background future condition.

The Cumulative No Project condition assumes that circulation system improvements are made but that no development occurs on the project site. “Plus Project” traffic volume forecasts were created by identifying the project’s trip assignment under long term conditions and manually adding these trips from the Year 2040 No Project values.



The analysis of cumulative traffic conditions conservatively assumes that existing peak hour factors (PHF's) at study area intersections will continue in the future. While it may be argued that PHF's may change in the future as background traffic increases, the presence of local schools will continue to influence peaking characteristics, particularly in the a.m. peak hour. For this reason this analysis assumes a "worst case" view by retaining existing PHF's.

### **Future Improvements**

Because the long-term cumulative analysis assumes community wide growth, it is appropriate to recognize the improvement needs that were previously identified by the GP EIR. While no improvements have been initially assumed in this cumulative analysis in order to present a "worst case" condition, the GP EIR suggested that the following improvements would be needed to accommodate General Plan growth, including the current GP Land uses on the project site:

- Widening of Santa Fe Avenue to 4 lanes
- Widening of Hatch Road to 4 lanes
- Signalization of Hatch Road / Tully Road intersection
- Signalization of Santa Fe / Mountain View Drive intersection

The City of Hughson has adopted a fee program to provide a mechanism to allow local development to contribute its fair share to the cost of improvements identified in the GP EIR. The current fee is \$4,101 per residential dwelling / lot.

The Stanislaus County 2018 Regional Transportation Plan / Sustainable Communities Strategy Appendix K presents a list of circulation system improvements anticipated over the long term by the County and local agencies. Table 9 notes projects in the project area, along with assumed funding sources:

<b>Table 9</b> <b>Selected Tier 1 Improvements from 2018 RTP</b>				
#	Location	Limits	Description	Cost (millions)
H06	Whitmore Ave & Santa Fe Ave		Construct Roundabout	\$1.00 <sup>1</sup>
H07	Euclid Ave	Hatch Road to Whitmore Ave	Complete Streets improvements	\$2.63 <sup>2</sup>
H08	7 <sup>th</sup> Street	Whitmore Ave to Santa Fe Ave	Improve to 2-lane Major Collector	\$2.69 <sup>2</sup>
H09	7 <sup>th</sup> St & Santa Fe Ave		Realign Roadway	\$0.35 <sup>3</sup>
H11	Tully Road	Whitmore Ave to City limit	Improve to 2-lane Major Collector	\$0.45 <sup>4</sup>
H12	Santa Fe Ave	South of Hatch Rd	Construct Roundabout	\$1.00 <sup>5</sup>
H13	Santa Fe Ave	North of 7 <sup>th</sup> Street	Construct Roundabout	\$1.00 <sup>5</sup>
H14	Various Locations		Roadway Rehabilitation	\$8.55
S62	Santa Fe Ave	Keyes Road to Geer Road	Widen to 3 lanes	\$4.41 <sup>7</sup>
S63	Santa Fe Ave	Geer Road to Hatch Road	Widen to 3 lanes	\$3.12 <sup>7</sup>
S64	Santa Fe Ave	Hatch Road to Tuolumne River	Widen to 3 lanes	\$2.81 <sup>7</sup>
<sup>1</sup> funding includes combination of STBGP, Measure L and CMAC <sup>2</sup> funding includes Developer Impacts Fees, SB1 <sup>3</sup> funding includes Developer Impact Fees <sup>4</sup> funding includes Developer Impact Fees, STBGP, SB 1 <sup>5</sup> funding includes Developer Impact Fees, CMAQ <sup>6</sup> funding includes STBGP, Measure L <sup>7</sup> Measure L funding				

### **Traffic Volume Forecasts**

**Daily Traffic Volumes.** Cumulative Year 2040 daily traffic volume projections are presented for with and without project conditions in Table 9.

**Peak Hour Traffic Volumes.** Peak hour volumes were developed for conditions with and without the project. Figure 6 presents a.m. and p.m. peak hour volumes assuming cumulative development

without the occupancy of the project site. Figure 7 presents “Cumulative plus Project” volumes.

### **Cumulative Levels of Service – Roadway Segments**

Table 10 identifies long term daily traffic volumes and Levels of Service on study area streets with and without the project. As indicated, projected volumes will create LOS D or better conditions on most segments. However, with and without the project Santa Fe Avenue will operate at LOS F and will need to be widened to provide 4 lanes to satisfy the City’s minimum Level of Service standard. This conclusion is consistent with the findings of the GP EIR.

**Impact 1.** The project will contribute to conditions on **Santa Fe Avenue** that exceed LOS D. Because the incremental increase in daily volume exceeds the 5% threshold, this is a significant impact.

**Discussion.** Widening Santa Fe Avenue to 4 lanes will deliver LOS C under General Plan thresholds. Some improvements to Santa Fe Avenue are noted in the 2018 RTP and the Hughson General Plan. The 2018 RTP indicates that Measure L funding will be available for improving Santa Fe Avenue to 3 lanes in the future. Thus, new development in Hughson should not be solely responsible for widening Santa Fe Avenue. Development in Hughson should contribute its fair share to the cost of widening Santa Fe Avenue beyond the three-lane level anticipated in the 2018 RTP. Parkwood’s share of future traffic on Santa Fe Avenue is noted in the following section. Payment of a fair share with credit from Hughson traffic impact fees and widening the project’s frontage to the City’s ultimate standard represent an applicable fair share mitigation.

**Mitigation 1.** The Parkwood project will contribute a “fair share” proportional cost to add 1 lane to Santa Fe Avenue, which in combination with 2018 RTP improvements would bring the roadway to 4 lanes as identified in the General Plan. This “fair share” amount will be offset by payment of current City traffic impact fee.

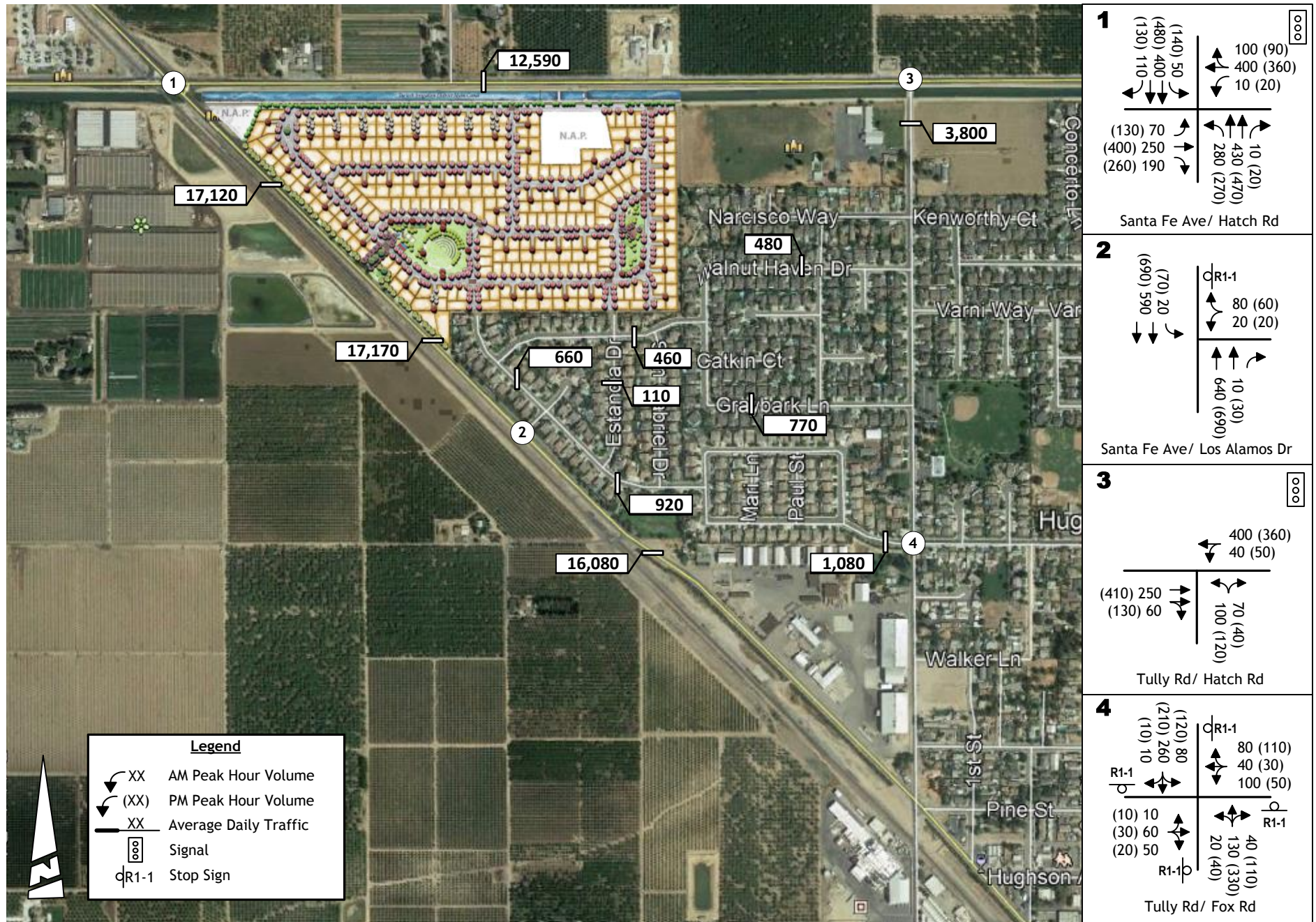
**Impact 2.** The project will contribute to cumulative traffic increases on the local roads south of the site which result as other portions of Hughson development in the future. The resulting traffic volumes will still remain well below the LOS D threshold and are all below the planning level threshold typically employed by communities to categorize acceptable traffic volume on local streets. Thus, the project’s impact is not significant.



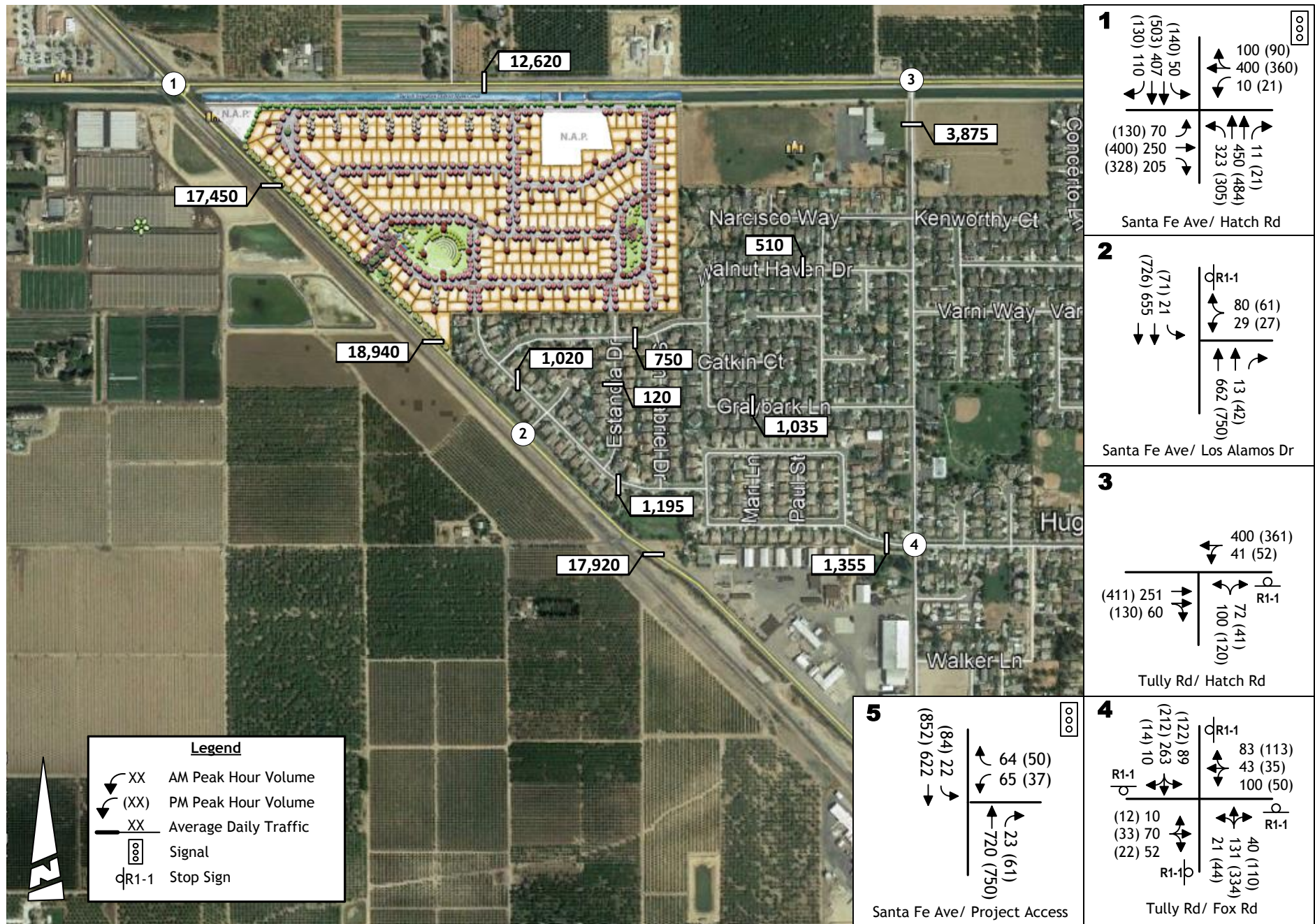
**TABLE 10  
LEVEL OF SERVICE DAILY TRAFFIC VOLUMES CUMULATIVE PLUS PROJECT**

Roadway	Location	Classification	Lanes	Cumulative		Cumulative Plus Project			
				Daily Volume	LOS	Daily Volume	LOS	Mitigated lanes	LOS
Hatch Road	Santa Fe Ave to Tully Rd	Arterial	2	12,590	C	12,620	C		
Tully Road	Hatch Rd to Narcisco Way	Collector	2	3,800	C	3,875	C		
Santa Fe Avenue	Hatch Rd to Project Access	Arterial	2	<b>17,120</b>	<b>F</b>	<b>17,450</b>	<b>F</b>		
Santa Fe Avenue	Project Access to Los Alamos	Arterial	2	<b>17,170</b>	<b>F</b>	<b>18,940</b>	<b>F</b>	4	C
Santa Fe Avenue	South of Los Alamos Drive	Arterial	2	<b>16,080</b>	<b>F</b>	<b>17,920</b>	<b>F</b>	4	C
Walnut Haven Drive	Heartnut Way to Tully Rd	Local	2	480	C	510	C		
Graybark Lane	Heartnut Way to Tully Rd	Local	2	770	C	1,035	C		
Leaflet Lane	Flora Vista Dr to Heartnut Way	Local	2	460	C	750	C		
Flora Vista Drive	Project to Los Alamos Dr	Local	2	660	C	1,020	C		
Estancia Drive	Leaflet Ln to Flora Vista Dr	Local	2	110	C	120	C		
Flora Vista Drive	Estancia Dr to Ester Marie Ave	Local	2	920	C	1,195	C		
Fox Road	Ester Marie Ave to Tully Rd	Collector	2	1,080	C	1,355	C		

**Bold** indicates conditions in excess of adopted standard      **Highlighted** values are a significant impact







## **Cumulative Levels of Service - Intersections**

The results of Level of Service analysis for both peak hours are shown in Table 11 and are further described in the following text.

**Intersection Levels of Service without the Project.** As noted in Table 11, if no development occurs on the project site, then two intersections will still operate with Level of Service that do not satisfy the City's Minimum LOS D standard, and another location could satisfy traffic signal warrants.

The **Santa Fe Avenue / Hatch Road intersection** will operate at LOS F if no improvements are made. Widening Santa Fe Avenue to provide two through lanes in each direction would deliver LOS D or better conditions. This level of improvement is consistent with the findings of the GP EIR, and widening Santa Fe Avenue is identified in the 2018 RTP.

The **Hatch Road / Tully Road intersection** is projected to operate at LOS E, and peak hour traffic signal warrants will be met. A traffic signal is needed to deliver LOS D or better conditions, and this improvement is consistent with the conclusions of the GP EIR.

The **Santa Fe Avenue / Los Alamos intersection** is projected to operate at LOS D but peak hour traffic signal warrants will be met with a two-lane Santa Fe Avenue. The 4-lane widening of Santa Fe Avenue described previously and aimed at segment LOS would also reduce delays at this location and would result in a condition that doesn't warrant a traffic signal.

**Plus Project Intersection Levels of Service.** As noted in Table 11, the addition of Project trips to cumulative background conditions results in four intersections which will operate with Levels of Service in excess of the City's minimum LOS D standard.

**Impact 3.** The **Santa Fe Avenue / Hatch Road intersection** will operate at LOS F with and without the project. Because conditions exceed the City's minimum LOS standard, the significance of the project's impacts is based on the change in delay. Compared to the No Project condition, the incremental delay increase caused by the project exceeds the significance criteria used for this analysis (i.e., more than 5 seconds). The project's impact is significant, and mitigation is required.

**Discussion 3.** The same improvements noted for the No Project conditions (i.e., two through lanes in each direction on Santa Fe Avenue) will deliver LOS D conditions with the project, and the proposed project should contribute its fair share to the cost of this cumulative mitigation. Adding lanes at the intersection would be consistent with the overall Santa Fe Avenue widening discussed in regards to roadway segment impacts. Thus, Mitigation 1 is also applicable to this impacts, and no further mitigation is required.

**Impact 4.** The **Hatch Road / Tully Road intersection** is projected to operate at LOS F with and without the project, and the significance of the project's impact is based on the change in average delay. Because the incremental change caused by the project does not exceed the increment permitted in this analysis (i.e., 5 seconds), the project's impact is not significant, and direct mitigation is not required.

**TABLE 11  
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE**

TABLE 11 CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE										
Intersection	Control	AM Peak Hour				PM Peak Hour				Signal Warrant Met with Project?
		Cumulative		Cum Plus Project		Cumulative		Cum Plus Project		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
Santa Fe Ave / Hatch Rd	Signal	F	113.9	F	122.7	F	121.3	F	126.6	--
Add lane in each direction on Santa Fe Avenue		D	46.4	D	48.2	D	47.2	D	48.4	-
Santa Fe Ave / Los Alamos Dr Westbound approach	WB Stop	C	23.3	D	30.7	D	30.0	E	47.9	Yes
Add lane in each direction on Santa Fe Avenue		C	15.8	C	18.1	C	19.2	D	25.6	
Install traffic Signal in lieu of widening Santa Fe Ave								B	11.5	
Tully Rd / Hatch Rd Northbound approach	NB Stop	C	21.1	C	21.2	E	37.4	E	39.7	Yes
	Signal	A	9.8	A	9.9	B	10.4	B	10.6	-
Tully Rd/ Fox Rd	All-Way Stop	C	18.9	C	21.2	C	19.0	C	22.8	No
Santa Fe Ave/ West Project Access Westbound approach	WB Stop	--	--	F	94.9	--	--	F	125.6	Yes
Add lane in each direction on Santa Fe Avenue				E	39.0			E	41.5	
Install traffic signal in lieu of widening Santa Fe Ave				B	10.3			A	9.6	
Bold indicates conditions in excess of adopted standard      Highlighted values are a significant impact										

**Impact 5.** The **Santa Fe Avenue / Project Access intersection** is projected to operate at LOS F with development of the project, as well as meeting signal warrants during the AM peak hour. Because LOS F exceeds the City's minimum standard, and traffic signal warrants are satisfied this is a significant impact that requires mitigation.

**Discussion.** Widening Santa Fe Avenue to four lanes through the intersection will reduce delay on the side street approach but will not result in LOS D. A traffic signal would still be needed. Alternatively, a traffic signal with separate left turn lanes on each approach will deliver LOS D or better conditions without adding additional through lanes on Santa Fe Avenue. A traffic signal is not required under "Existing Plus Project" conditions but will be needed in the future with some combination of project and through traffic.

**Mitigation 5.** The Parkwood project will be required to pay its "fair share" of the cost of a new traffic signal.

**Impact 6.** The **Santa Fe Avenue / Los Alamos Drive intersection** will operate at LOS E with the project in the p.m. peak hour, and peak hour warrants will be satisfied. Because LOS E exceeds the minimum standard and warrants are satisfied this impact is significant and mitigation is required.

**Discussion.** The same improvements (i.e., 4-lane Santa Fe Avenue) described for the No Project condition would yield LOS D or better with the project. Alternatively, installing a new traffic signal without widening Santa Fe Avenue would also deliver satisfactory Level of Service. Mitigation 1 (widening Santa Fe Avenue) will address this impact, and no additional mitigation is required.

**Fair Share Contribution.** The project's relative share of traffic caused by future regional and Hughson growth has been estimated as noted in Table 12. The allocation method is taken from Caltrans traffic study guidelines and assumes that only future new traffic will be responsible for contributing to the cost of future improvements. However, recognizing that ½ of each project trip has a destination elsewhere that is also responsible for mitigation the applicable fair share is ½ of the traffic contribution.



**TABLE 12  
FAIR SHARE CALCULATION SUMMARY**

Street	Location	Existing Traffic	Project Traffic Only	Total Cumulative Plus Project Traffic	Net Future Traffic	Parkwood Percentage of Future New Traffic	Fair Share
		A	B	C	C-A	B/(C-A)	50% of B/(C/A)
Santa Fe Ave	Hatch Road to Access	8,555	330	17,450	8,895	3.7%	1.9%
Santa Fe Ave	Access to Los Alamos Drive	8,555	1,770	18,940	7,745	22.9%	11.4%
Santa Fe Ave	South of Los Alamos	7,725	1,840	17,920	10,195	18.1%	9.0%
Santa Fe Ave	Hatch Road intersection	1,835 (PM)	36	2,806	971	3.7%	1.9%
Hatch Road	Tully Road intersection	890 (PM)	9	1,119	229	3.9%	2.0%
Santa Fe Ave	Parkwood Access	743 (PM)	221	1,700	957	23.1%	12.0%
Santa Fe Ave	Los Alamos Drive intersection	799 (PM)	195	1,755	956	20.4%	10.1%



## **APPENDIX**

(under separate cover)

# **Appendix D**

## **Water Supply Plan**

## MEMORANDUM

DATE: February 25, 2020 Project No.: 487-60-20-20  
SENT VIA: EMAIL

TO: Steve McMurtry, De Novo Planning Group

FROM: Aileen Kondo, PE, RCE #74367

REVIEWED BY: James Connell, PE, RCE #63052

SUBJECT: Evaluation of Water Supply Plan for the Parkwood Subdivision Project in the City of Hughson

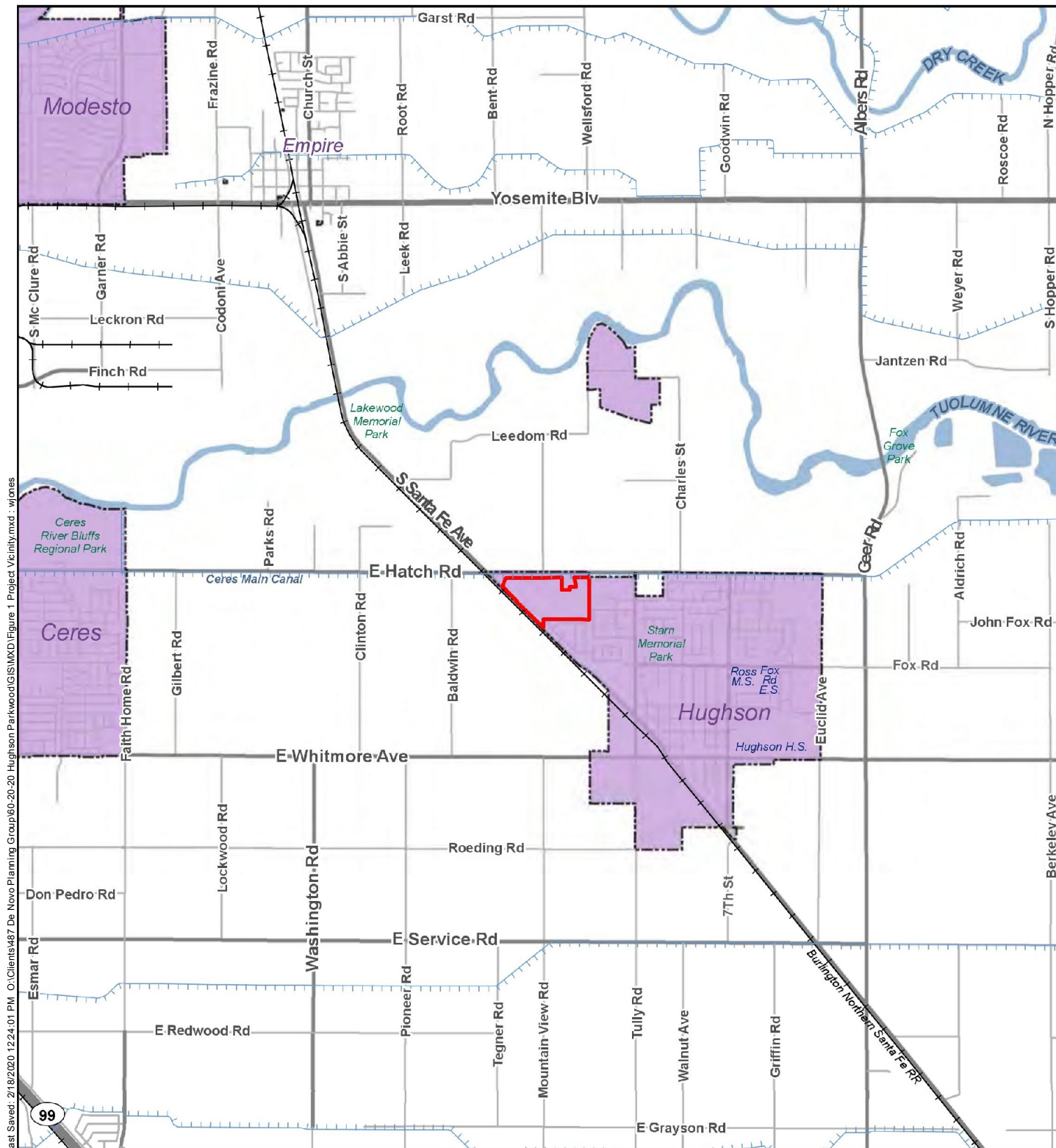
### INTRODUCTION

A new development, the Parkwood Subdivision Project (Project), is planned in the City of Hughson (City). The De Novo Planning Group (De Novo), an environmental consultant, is coordinating the evaluation of the City's water supply plan for the Project. The Project location is shown in Figure 1.

West Yost Associates has been contracted by De Novo to evaluate whether the City's current water supply and water supply plan will provide sufficient water for the City's water demands with the addition of the Project. The evaluation involves review of documents prepared by others that include information on water supply capacities, recent City potable water production rates, and the Project's projected water demands.

This technical memorandum (TM) summarizes the findings from the evaluation and includes:

- A description of the Project and its projected water demands
- A summary of the City existing and projected water demands
- A description of the City's water supply
- An assessment of the capacity of the City's water supply to meet projected demands
- A summary of the water fees contributed by the Project
- Summary and conclusions



Last Saved: 2/18/2020 12:24:01 PM O:\Clients\487 De Novo Planning Group\60-20-20 Hughson Parkwood\GIS\MXD\Figure 1 Project Vicinity.mxd - wjones

- Project Boundary
- City Area
- Canal
- River
- Railroad



- Notes:
1. Figure is not to scale.
  2. Source: De Novo Planning Group, City of Hughson Parkwood Subdivision, Figure 2. Project Vicinity.

**Figure 1**

**Project Vicinity**

De Novo Planning Group  
Water Supply Plan Evaluation  
Parkwod in City of Hughson

## PARKWOOD SUBDIVISION PROJECT DESCRIPTION AND WATER DEMANDS

Located north of Leaflet Lane, south of East Hatch Road, east of Santa Fe Avenue, and west of Heartnut Way in Hughson, California, the Project area consists of 56.04 acres currently zoned by the City for residential and commercial uses. The residential component of the Project will include 299 single-family residential lots with a single-family home on each lot. Two distinct layouts are planned for the residential component: traditional residential lots (Park Homes) and a cluster of lots with a shared driveway (Courtyard Homes). Ninety-nine Park Homes and 200 Courtyard Homes are planned.

The Project will have two common spaces, totaling 4.53 acres, for park and dual-use facilities. One of the common spaces (1.33 acres) will be located in the eastern portion of the subdivision; the other common space (3.20 acres) will be located in the western portion of the subdivision. The Project will include landscaping along Santa Fe Avenue and East Hatch Road.

The Project's water demand was estimated based on the land use and acreage and is summarized in Table 1 below. The Project's average day demand (ADD) and max day demand (MDD) were estimated to be 0.163 million gallons per day (mgd) and 0.325 mgd, respectively.

Table 1. Parkwood Subdivision Project Water Demand Estimation <sup>(a)</sup>		
Parameter	Units	Value
Land Use	-	Medium Density Residential
Area	acres	56.04
Water Demand Factor	gpd/acre	2,900
ADD	gpd	162,516
MDD	gpd	325,032
(a) Parkwood Project water demand estimation as documented in the <i>Water Study for Parkwood Single-Family Residential Development</i> prepared by MVE, Inc. in January 2020.		

The Project will be served by the City's existing water system. An 8-inch looped water system will be installed to supply water to the subdivision. The looped water system will connect to the City's existing 8-inch water main at Leaflet Lane, Flora Vista Drive, and Estancia Drive. Flow testing at hydrants near these connection points and simulations with a water model have been conducted by others to verify that the City's existing water distribution system and the planned extension will have the hydraulic capacity to meet the City's fire flow requirements. Findings from the analysis are documented in the January 2020 *Water Study for Parkwood Single-Family Residential Development (2020 Parkwood Water Study)* prepared by MVE, Inc.

## CITY OF HUGHSON EXISTING AND PROJECTED WATER DEMANDS

Table 2 summarizes the City's annual well production from 2012 through 2016. Due to drought and resulting water conservation efforts, water production in 2015 and 2016 were lower than in previous years.

Table 2. City of Hughson Well Production from 2012 through 2016 <sup>(a)</sup>		
Year	Annual Total Well Production, mgy	Averaged Daily Well Production, mgd
2012	484	1.32
2013	575	1.58
2014	448	1.23
2015	397	1.09
2016	397	1.09
(a) The data are from the 1,2,3-TCP Mitigation Feasibility Study prepared for the City of Hughson in April 2018.		

Table 3 summarizes the water demand projections estimated in 2005 in the City's 2005 *Urban Water Management Plan (2005 UWMP)*<sup>1</sup>. The City has indicated that the 2005 UWMP is no longer valid, but the 2005 projected water demands are shown here to provide historical water projections for comparison. The City's actual water demands, based on the water production data, have been lower than the projected demands. The water demands have not increased much beyond the existing water demand in 2005 and have instead decreased in recent years due to water conservation efforts.

Table 3. City of Hughson Water Demand Projections from 2005 <sup>(a)</sup>					
Year	Average Day Demands, mgd				
	Existing Customers <sup>(b)</sup>	Infill Development <sup>(c)</sup>	New Development <sup>(d)</sup>	Total	
				mgd	mgd
2005	1.5	0.0	0.0	1.5	548
2010	1.2	0.2	0.8	2.2	803
2015	1.2	0.3	1.6	3.2	1,168
2020	1.2	0.5	2.5	4.1	1,497
2025	1.2	0.6	3.3	5.1	1,862
(a) The projections are from the 2005 UWMP, Table 5.5.					
(b) Existing customer demands were projected to decrease from the installation of water meters.					
(c) Consists of growth within the City boundary.					
(d) Consists of growth outside the City boundary but within the City's sphere of influence.					

For the purposes of this evaluation, the City's existing average day water demands will be based on the maximum annual well production from the available well production data listed in Table 2 (1.58 mgd).

<sup>1</sup> Water suppliers with more than 3,000 connections or that deliver more than 3,000 acre-feet per year are required to prepare UWMPs every five years. The City has not updated its UWMP since 2006 because it has fewer than 3,000 connections and delivers less than 3,000 acre-feet per year of water.

There are a number of other development projects currently under construction or approved with a development agreement. These projects and their associated projected water demands are listed below in Table 4.

Table 4. City of Hughson Development Projects <sup>(a)</sup> and Water Demands				
Development Projects <sup>(b)</sup>	Number of Single-Family Lots	Average Demand Factor, <sup>(c)</sup> gpd/du	ADD, mgd	MDD, <sup>(d)</sup> mgd
Euclid South	69	543.5	0.04	0.08
Provence Place	39		0.02	0.04
Euclid North	50		0.03	0.05
Total	158		0.09	0.17
<p>(a) The development projects and number of single-family lots in each project were provided in an email communication from Sean Tobin, Mid-Valley Engineering, Inc., dated February 21, 2020.</p> <p>(b) The Euclid South and Park Place developments are under construction. The Euclid North project has been approved with a development agreement.</p> <p>(c) The Average Demand Factor in gallons per day per dwelling unit for the single-family lots, determined in the 2020 Parkwood Water Study, was used to estimate water demands for the development projects.</p> <p>(d) The MDD was computed by applying peaking factor of 2.0 x ADD; the peaking factor is from the 2005 UWMP, Table 5.2.</p>				

Table 5 summarizes the City's current existing and projected water demands with the addition of the water demands from the development projects and the Parkwood Subdivision. The City's total projected MDD is 3.66 mgd.

<b>Table 5. City of Hughson Current Existing and Projected Water Demands</b>		
Water Demands	ADD, mgd	MDD, <sup>(a)</sup> mgd
Existing	1.58	3.16
Development Projects <sup>(b)</sup>	0.09	0.17
Parkwood Project	0.16	0.33
Total	1.83	3.66
<p>(a) The MDD was computed by applying peaking factor of 2.0 x ADD; the peaking factor is from the 2005 UWMP, Table 5.2.</p> <p>(b) See Table 4.</p>		

## CITY OF HUGHSON WATER SUPPLY

The City currently uses local groundwater as its sole source of water supply. The 2005 UWMP indicated that the City planned to supplement its water supply with surface water purchased from the Turlock Irrigation District (TID); however, the City no longer intends to contract with TID for surface water deliveries.



The City has six groundwater wells (Wells 3, 4, 5, 6, 7, and 8) that extract water from the underground aquifers. Another well (Well 9) is currently under construction. The status of these wells are as follows:

- Wells 3, 4, and 8 are actively used for municipal supply.
- Well 5 was designated as a standby well for municipal supply due to elevated levels of 1,2-dibromo-3-chloropropane (DBCP). Since the detection of high levels of DBCP, Well 5 had been used only when one or more of the active wells were taken out of service or when supplemental flow was needed for firefighting. The Well 7 Replacement Project is currently under construction and involves reconstruction of Well 5, construction of Well 9, installation of an arsenic treatment facility, and installation of a one-million-gallon water storage/blending tank. The treatment and blending facilities will be used to treat and blend groundwater from both Wells 5 and 9.
- Well 6 was converted to supply non-potable uses in 2013, due to elevated levels of arsenic and nitrate.
- Well 7 has been inactive since 2015, due to elevated levels of nitrate, and will be replaced by Well 9.
- Well 9 is currently under construction as a part of the Well 7 Replacement Project and will be used for municipal supply.

Production flow rates for the municipal wells are summarized in Table 6.

Table 6. Municipal Well Production Flow Rates		
Well	Status	Flow Rate, <sup>(a),(b)</sup> gpm [mgd]
3	Active	1,400 [2.02]
4	Active	1,000 [1.44]
5	Standby/Under Construction	1,000 [1.44]
8	Active	1,500 [2.16]
9	Under Construction	1,800 [2.59]
<p>(a) Capacities for Wells 3, 4, 5, and 8 are as listed in the <i>1,2,3-TCP Mitigation Feasibility Study</i>. The Well 3, 4, and 5 capacities differ from well capacities listed in the <i>2005 UWMP</i>. The capacities from the <i>1,2,3-TCP Mitigation Feasibility Study</i> were used for this evaluation, as it is the more current document.</p> <p>(b) Per email communication from Sean Tobin, dated February 11, 2020, the Well 9 capacity is anticipated to be between 1,800 and 2,000 gpm and has the potential to produce up to 3,000 gpm if needed in a fire event. This information was provided through a telephone conversation with Jamie Velazquez, the City's Utilities Superintendent.</p>		

Currently, only Well 8 has an iron-assisted coagulation and filtration treatment system for arsenic removal. After the completion of the Well 7 Replacement Project, Wells 5 and 9 will also have treatment for arsenic removal. All the wells have sodium hypochlorite addition.

In 2017, the State Water Resource Control Board (SWRCB) Division of Drinking Water (DDW) adopted regulation for 1,2,3-trichloropropane (TCP), setting a maximum contaminant level (MCL) of 0.005 µg/L. In 2018, the City collected the first compliance samples for TCP from the active drinking water wells. TCP levels in all the active wells exceeded the MCL. A feasibility study was conducted to evaluate alternatives for TCP mitigation and is documented in the April 2018 *1,2,3-TCP Mitigation Feasibility Study*. Treatment with granular activated carbon (GAC) was determined to be the best solution, and installation of GAC treatment systems for all the municipal supply wells is planned. With treatment, it is assumed that the full well capacities listed in Table 5 will be available for municipal supply.

## WATER SUPPLY AND DEMANDS ASSESSMENT

For adequate water supply capacity, per DDW and industry standards, the water production capacity should be equal to or greater than the MDD. For reliability, the production capacity should include the total well capacity without the largest well in service; this is referred to as the “firm capacity.” Table 7 lists the water production capacities under various scenarios, including a possible future scenario where Well 4 is decommissioned. Under all scenarios, except for the existing firm capacity scenario, the total water supply capacity exceeds the City’s projected MDD of 3.66 mgd. The existing firm water production capacity is adequate to supply the City’s existing water demands. Wells 5 and 9 should be in service by the time the Parkwood Subdivision is built out, and the future firm water production capacity will be adequate to supply the City’s total water demands when the Project’s water demands are fully realized.

Table 7. Total Municipal Water Production Capacity Under Varying Scenarios			
Scenario	Description	Wells Online	Total Supply, mgd
Total Existing	All existing wells	3, 4, 8	5.62
Existing Firm Capacity	Existing wells without largest well	3, 4	3.46
Total Future	All existing and future wells	3, 4, 5, 8, 9	9.65
Future without Standby Well	Existing and future wells without standby well	3, 4, 8, 9	8.21
Future Firm Capacity	Existing and future wells without largest well	3, 4, 5, 8	7.06
Alternate Total Future	Well 4 decommissioned	3, 5, 8, 9	8.21
Alternate Future Firm Capacity	Without Well 4 and largest well	3, 5, 8	5.62

This evaluation considered the City’s water supply capacity only and did not consider the delivery capacity. The delivery capacity is the sum of the capacities of the wells that pump directly into the water distribution system and the firm capacity of the booster pump stations that pump water from storage into the distribution system, and any gravity flows from storage reservoirs that are at hydraulic grade. The delivery capacity should be equal to or greater than the MDD plus fire flow or the peak hour demand, whichever is greater.

## PROJECT'S SHARE OF WATER SYSTEM IMPROVEMENTS AND OPERATIONS & MAINTENANCES COSTS

To fund water system upgrades and ongoing operation and maintenance of existing water facilities, the City collects Development Impact Fees (DIF) and Water User Rate Fees (WURF). The DIF is a one-time fee paid for each single-family home constructed within a proposed development. The WURF is a monthly fee for all existing homes. Table 8 summarizes the amounts that the Parkwood Project will contribute through water fees to help finance the City's water facility improvements and operating costs.

Table 8. Parkwood Project Water Fees			
Fee	Fee Amount <sup>(a)</sup> (per Dwelling Unit)	Number of Dwelling Units	Fees to be Collected
DIF	Water Fee: \$3,803/unit Construction Water Fee: \$155/unit	299	\$1,183,442 (one-time)
WURF	\$53/unit per month		\$190,164 (annual)
(a) 2020 Rates. DIF = Development Impact Fee, WURF = Water User Rate Fee			

## SUMMARY AND CONCLUSION

The City's current projected MDD, including estimated water demands for the Parkwood Project and development projects currently in construction or approved for development, is 3.66 mgd. For adequate and reliable water supply per DDW and industry standards, the firm water production capacity (without the largest well in service) must be greater than the MDD. When the construction of the Well 7 Replacement Project is complete and Wells 5 and 9 are available for municipal supply, the total firm water production capacity will be 7.06 mgd, which is almost twice the projected MDD.

The City's water supplies are expected to be more than capable of meeting the City's projected water demands at the buildout of the Project. This conclusion is based on the following assumptions:

- The City will address water quality issues, including those identified in the 2018 *1,2,3-TCP Mitigation Feasibility Study*, so that the full capacity of the municipal water supply wells is available.
- The well supply capacities will not be impacted by groundwater sustainability measures.
- The well supply capacities in single dry and multiple drought years are the same as in normal years.

The development will be paying water system impact fees to the City totaling \$1,183,442. At buildout, the subdivision will be contributing \$190,164 annually in water rates. These fees can be used to partially offset capital costs of the City's planned water system improvements and ongoing operation and maintenance of the water facilities.

## REFERENCES

Carollo Engineers, “2005 Urban Water Management Plan,” City of Hughson, Hughson, CA, November 2006.

De Novo Planning Group, “Initial Study and Mitigative Negative Declaration for the Parkwood Subdivision Project,” City of Hughson, Hughson, CA, July 2019.

MVE, Inc., “Water Study for Parkwood Single-Family Residential Development,” Hughson, CA, January 2020.

Provost & Prichard Consulting Group, “1,2,3-TCP Mitigation Feasibility Study,” City of Hughson, Hughson, CA, April 2018.

DRAFT

# **Appendix E**

## **Water System Analysis**

# **Technical Memorandum**



**Date:** June 2, 2020

**To:** Lea C. Simvoulakis  
Community Development Director  
City of Hughson

**From:** Cort Abney, P.E.

**Subject:** **Parkwood Subdivision Project**  
**Water System Analysis**  
**Summary of Results and Recommendations**

Per your request, we have performed an evaluation of the proposed Parkwood Subdivision water system, and are providing this technical memorandum summarizing methods, results, and recommendations resulting from the analysis. The purpose of the evaluation was to determine if the water distribution system proposed for the project is of sufficient capacity to provide for the project's domestic and fire suppression demands, and other off-site demands that will rely on the project's water system. The results of the analysis indicate that the system, as proposed, is adequately sized for the flow conditions evaluated.

## **Evaluation Method and Assumptions**

The Parkwood Subdivision water distribution system was evaluated using Bentley WaterCAD V8i hydraulic network software. An full model of the City's water system, including existing and pending wells and storage, was modified for the analysis by adding the Parkwood Subdivision piping and projected demands, as provided by MVE, Inc. (*Water Study for Parkwood Single-Family Residential Development*, dated January 14, 2020). In addition, distribution piping was extended from the subdivision to provide fire suppression protection to the Jehovah Witnesses Kingdom Hall Church, located at 1524 Santa Fe Avenue. It was recommended that the church be included in the demands, as the Parkwood project will unify church property with existing City development and services.

The Parkwood Subdivision's proposed water system consists of a network of 8" diameter pipes, with two (2) points-of-connection (POC) to the City's water system. The POC's include a connection to the terminus of an existing 8" diameter pipe in Flora Vista Drive, and a second to the terminus of an existing 8" diameter pipe in Estancia Drive, both north of Leaflet Lane. These connections effectively extend the City's water distribution system, relying on pressure and flow capacity from the City's existing system at said POC's. No additional pumps or supplies are proposed at these locations.

Model water demands for the project included domestic residential and fire suppression. Residential demand assumptions for the Parkwood project were based on the MVE, Inc. study, and State of California, Division of Drinking Water standards to determine maximum day demand (MDD) capacity requirements for Hughson. For the existing system, the City's permit requires the City provide and maintain capacity and conveyance for the highest demand recorded in the past 10-years. According to City operations records, the highest annual water demand occurred in 2013 (575 MG), resulting in a

MDD of 3.54 MGD. With the addition of current and proposed development projects, including Parkwood, total system MDD increases to approximately 4.2 MGD. Of note, the unit water demands projected for the current and proposed projects are less than the City's existing unit demands, since these projects will be constructed using new conservation standards and codes (i.e. Green Building Code).

Model scenarios are typically performed assuming the greater of MDD with a fire suppression event, or during a peak hour demand (PHD). According to the Hughson Fire Protection District, the church requires 1,750 gpm flow for fire suppression, which is greater than the subdivision's fire demand. This demand also exceeds demands anticipated during a PHD. Thus, a MDD + fire scenario was used for modeling the system.

Two (2) scenarios were developed for different source water production conditions, included the following:

**Scenario #1** - *"Existing System"*, consisting of existing Wells 3, 4, and 8, and Fox Road 0.75MG storage/pumping facility; and

**Scenario #2** - *"Future System with Certain Sources Temporarily Offline"*, consisting of Well 8 and future Wells 9 and 10/Tully Road 1.0 MG storage/pumping, and Wells 3 and 4 temporarily offline.

These two scenarios were performed to verify (1) approval of the Parkwood project is acceptable with existing water infrastructure (i.e. project is not dependent upon future water system improvements), and (2) with operation of Wells 9 and 10/1.0 MG storage and pumping, Wells 3 and 4 can be taken out-of-service temporarily for near-term improvements, including installation of new TCP treatment equipment as currently anticipated by the City. Well 8 will need to remain in service during periods of high demand for both scenarios. Thus, Well 8 can only be removed from service to address TCP improvements during periods of low demand.

## Results

The following table provides a summary of results for the modeling scenarios evaluated. The pressure and flow data presented includes pipes and nodes associated with the Parkwood Subdivision.

**Summary of Model Results**

Condition	Scenario #1	Scenario #2
Sources Active	W3, W4, W8, Fox Storage	W8, W9 Storage (W9/W10)
Source Production/Pressure		
W3	1,140 gpm/58 psi	Off-line
W4	1,160 gpm/58 psi	Off-line
W8	1,500/56 psi	1,500 gpm/56 psi
W9	Off-line	3,240 gpm/63 psi
Fox Road Storage	940 gpm/59 psi	Off-line
Total Production	4,740 gpm	4,740 gpm
Lowest Pressure/Node	27 psi/401 (church)	32 psi/401 (church)
Highest Velocity/Pipe/Location	7.85 fps/525/Estancia Drive	7.85 fps/525/Estancia Drive
All Conditions Satisfied	Yes	Yes



## **Findings and Recommendations**

The hydraulic model results indicate that the Parkwood Subdivision water system, as proposed by MVE, Inc., will provide adequate flow and pressure to meet the highest anticipated MDD + fire suppression condition. A Peak Hour condition was not performed since MDD + fire represents the higher demand scenario. Model results indicate that all City production facilities were within normal operational range for pressure and flow for both conditions described.

One pipe in the system exceeded 7 fps, a maximum flow rate value that the City uses for design of new piping system improvements. The purpose of using this value is to minimize headloss in any given pipe to ensure adequate pressures throughout the system. However, residual pressures at the church were sufficiently above minimum requirements (20 psi) during a fire suppression event to be of concern. A portion of the pipe with the high velocity is part of the City's existing system (#525 – Estancia Drive), so replacing the pipe with a larger diameter pipe would be costly and disruptive. Further, since the pipe length is relatively short, total headloss is minimal. Thus, it is not recommended that the pipe be replaced, nor increase the diameter of the proposed section of pipe to be installed by Parkwood.

It is recommended that the Parkwood provide a 10" pipe, fire hydrant, and dedicated easement to the church parcel. Since total fire suppression demand for the church is 1,750 gpm, and individual fire hydrants are designed for no more than 1,500 gpm, a second fire hydrant and additional piping will be required on the church property to achieve the required flow requirement. However, it is not expected that the Parkwood project be responsible for those additional improvements.