City of Merced

Notice of Preparation of a Draft Environmental Impact Report

Date: January 9, 2020

Project Title: Municipal Well Site 22 Project

To: Responsible Agencies, Organizations, and Interested Parties

Lead Agency: City of Merced
Public Works Department
1776 Grogan Road
Merced, CA 95341
(209) 388-8729

Contact: Joseph Angulo, P.G., Acting Deputy Director Public Works, Public Works Department, City of Merced

INTRODUCTION

The City of Merced (City) will prepare an Environmental Impact Report (EIR) that addresses the potential impacts of constructing and operating the proposed Municipal Well 22 (project). Your input is requested in the form of written comments regarding the scope of the EIR including potential environmental impacts and alternatives to be considered.

The EIR is being prepared in compliance with the California Environmental Quality Act (CEQA). Under CEQA, upon deciding to prepare an EIR, the City, as lead agency, must issue a Notice of Preparation (NOP) to inform trustee agencies, the public, and responsible agencies of the decision. Accordingly, the purpose of this NOP is to provide information describing the proposed project including associated potential environmental effects to those in the public who may wish to comment regarding the scope and content of the information to be included in the EIR. Agencies should comment on such information as it relates to their statutory responsibilities in connection with the proposed project.

This notice, accompanied by an Initial Study, is being sent to the State Clearinghouse, identified responsible agencies, and other interested parties. Presently known responsible agencies include: the County of Merced, the California State Water Resources Control Board, and the California Department of Fish and Wildlife. When the Draft EIR is published, it will be sent to the State Clearinghouse, available for review at local libraries, and an electronic version will be available on the City's website, http://www.cityofmerced.org.

The EIR will provide an evaluation of potential environmental impacts associated with implementation of the proposed project. The location, description, and environmental resource

areas that may be affected by the proposed project are described below and in the accompanying Initial Study. The EIR will evaluate potentially-significant environmental impacts of the proposed project, a direct, indirect, and cumulative basis; identify mitigation measures that may be feasible to lessen or avoid such impacts; and identify alternatives that may lessen one or more potentially-significant environmental impacts resulting from the proposed project.

A Final EIR with responses to comments on the Draft EIR will be prepared prior to final consideration of the proposed project. Notices of public hearings on the project and the availability of the Final EIR will also be provided to NOP respondents, those requesting such notice, and available on the City's website, http://www.cityofmerced.org.

PROJECT LOCATION/SETTING

The project site is located at 3987 Hatch Road in unincorporated Merced County. Figure 1 of the attached Initial Study, Project Vicinity, shows the setting of the project site in the Merced County region.

PROJECT DESCRIPTION

Within its service area, the City proposes the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the California State Water Resources Control Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Plan and the recommendations contained in technical reports by the City's engineering consultant. The project would maintain the surety of the City's water supply in the event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

Refer to Section 1.0, Project Description, of the Initial Study for a complete description of the proposed project.

ENVIRONMENTAL EFFECTS AND SCOPE OF THE EIR

This project may have a significant effect on the environment and an EIR is required. This determination is based upon the criteria of the State CEQA Guidelines, Sections 15063 (Initial Study), 15064 (Determining Significant Effect), and 15065 (Mandatory Findings of Significance), and for the reasons documented in the Environmental Evaluation (Initial Study) for the project, which is attached.

The EIR will focus on evaluating the topic of Hydrology and Water Quality as it relates to decreasing groundwater supplies. All other topical issues are evaluated in an attached Initial Study, including: Aesthetics, Agriculture and Forestry Resources, Biological Resources, Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use

and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire. The EIR will evaluate project and cumulative impacts, growth inducement, short-term versus long-term impacts, effects on human beings, and alternatives to the proposed project.

Alternatives to be considered for this project will include, but will not be limited to, the No Project Alternative and one or more alternatives that would reduce potentially-significant impacts. This determination is based upon the criteria of the State CEQA Guidelines, Section 15126.6 (Consideration and Discussion of Alternatives to the Proposed Project).

SUBMITTING COMMENTS

Comments and suggestions as to the appropriate scope of analysis in the EIR are invited from all interested parties. Written comments or questions concerning the EIR for the Municipal Well Site 22 Project should be directed to the City's environmental manger, at the following address by 5:00 PM on February 7, 2020.

Joseph Angulo, P.G., Acting Deputy Director Public Works
Public Works Department, City of Merced
1776 Grogan Road
Merced, CA 95341
E-mail: anguloj@cityofmerced.org

All comments should include the name, email address, phone number, and mailing address of the contact person submitting the written response. In the event no response or request for additional time is received by any responsible agency or trustee agency by the end of the review period on February 7, 2020, the City may presume that the responsible agency or trustee agency has no response.

SCOPING MEETING

A public scoping meeting will be held to receive comments on environmental issues that should be addressed in the Draft EIR as well as the range of practicable alternatives to be evaluated in the Draft EIR. The date, time, and location of this meeting are as follows:

Date: January 15, 2020
Time: 1:00 PM
Place: City Council Chamber
Merced Civic Center
678 West 18th Street
Merced, CA 95340

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PUBLIC REVIEW DRAFT

MUNICIPAL WELL SITE 22 PROJECT
INITIAL STUDY

MERCED, CALIFORNIA

Submitted to:

Joseph Angulo, P.G., Acting Deputy Director Public Works
City of Merced Public Works Department
1776 Grogan Road
Merced, California 95341

Prepared by:

LSA
7086 North Maple Avenue, Suite 104
Fresno, California 93720
559.490.1210

LSA Project No. MED1901

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
APN	Assessor's Parcel Number
AR	Agriculture Residential
BSA	Biological Study Area
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
City	City of Merced
CMU	concrete masonry unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
DDW	Division of Drinking Water
DTSC	Department of Toxic Substances Control
Farmland	Farmland of Statewide Importance
HCP	Habitat Conservation Plan
I-5	Interstate 5
MRZ	Mineral Resource Zones
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas & Electric
PRC	Public Resources Code
project	Municipal Well Site 22 Project

ROG	Reactive Organic Gas
RR	Rural Residential
SCADA	Supervisory Control and Data Acquisition
SOI	Sphere-of-Influence
SR 152	State Route 152
SR 52	State Route 52
SRA	State Responsibility Areas
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle Miles Travelled

1.0 PROJECT DESCRIPTION

The following describes the proposed Municipal Well Site 22 Project (project). The project would include the construction and operation of a new municipal well on a 4.01-acre. This section includes a summary description of the project's location, existing site characteristics, and required approvals. The City of Merced (City) is the lead agency for review of the project under the California Environmental Quality Act (CEQA).

1.1 PROJECT SITE

The following section describes the location and characteristics of the project site and provides a brief overview of the existing land uses within and in the vicinity of the project site.

1.1.1 Location

The project site is located at 3987 Hatch Road in Merced County, on the southwest corner of the intersection of East Cardella Road and Hatch Road, and within the ROW of Hatch Road between East Cardella Road and East Yosemite Avenue, a length of approximately 1 mile. The proposed well would be located on Assessor's Parcel Number (APN) 060-560-002. Figure 1 shows the project site's regional and local context.

1.1.2 Site Characteristics and Current Site Conditions

The project site is located at 3987 Hatch Road in Merced County, on the southwest corner of the intersection of East Cardella Road and Hatch Road. The proposed well would be located on Assessor's Parcel Number (APN) 060-560-002. Figure 1 shows the project site's regional and local context.

1.1.3 Existing General Plan and Zoning

The project site is located in Merced County within the Sphere-of-Influence (SOI) of the City of Merced.

The proposed well site is designated Rural Residential (RR) in the City of Merced 2030 General Plan. This land use designation is intended to provide single-family homes on large lots in a semi-rural environment. This land use is also intended to serve as a buffer between the City's urbanized areas and agricultural land and other environmentally sensitive areas or resource areas.

The project site is located in Merced County's Agriculture Residential (AR) zoning district. The purpose of the A-R zoning district is to provide areas for rural residential development and hobby farming; and limited animal raising operations with less than a full range of urban services. This zoning district is typically intended to serve as a transitional area between more dense urban communities and agricultural uses with the option of allowing either one unit or three residential units per acre.

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LEGEND

Project Site

FIGURE 1

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SOURCE: ESRI World Maps (08/19); Google Maps Sat (08/2019).

I:\MED1901\GIS\Maps\Figure 1_Project Location and Regional Vicinity Map.mxd (10/8/2019)

Merced Municipal Well Site 22 Project

Project Location and Regional Vicinity Map

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The project site is designated AR in the County of Merced 2030 General Plan. This designation also provides for single-family dwellings on large lots in a semi-rural environment with limited public services. This designation is typically applied to areas on the edge of urban areas, and is often used as a buffer between urban and rural land uses.

1.1.4 Surrounding Land Uses

The project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to three acres in size. Figure 2 depicts an aerial photograph of the project site and identifies surrounding land uses. As shown in Figure 2, single-family homes are located directly south and northeast of the proposed well site. The adjacent residential uses rely on residential groundwater wells and septic tanks. Land to the west of the proposed well site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use.

1.2 PROJECT OBJECTIVES

The City has identified the following objectives for the Well 22 project:

1. Provide replacement water supply for City Well 7B, which was removed from service due to elevated nitrate concentrations;
2. Enhance the reliability and redundancy of water supplies when existing wells are out of service for maintenance or other reasons; and
3. Serve as a source of water supply in the event of a water infrastructure or water supply emergency.

1.3 PROPOSED PROJECT

The City proposes within its service area the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the California State Water Resources Control Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Program.[1] The project would maintain the surety of the City's water supply in the event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

[1] Merced, City of, 2018. 5-Year Capital Improvement Program (2018-2023). May 23.

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FIGURE 2

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Project Site

Merced Municipal Well Site 22 Project

Aerial Photograph of the Project Site and Surrounding Land Uses

SOURCES: GOOGLE EARTH, 5-16-18; LSA, 2019.

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1.3.1 Municipal Well Site 22

The proposed well site is located within a 4.01-acre parcel, approximately 1.09 acres of which is dedicated as ROW for the future extension of East Cardella Road. Well 22, the water storage tank, and associated infrastructure would be located within the parcel in an area approximately 1.84 acres in size that would be set back from Hatch Road by approximately 185 feet.

Although the City has not prepared final design plans for the project, Well 22 would be approximately 600 feet deep and designed to yield 2,500 gallons per minute. Figure 3 provides a conceptual site plan of the project site.

Associated infrastructure that would be constructed as part of the project would include an approximately 10,000 square-foot concrete masonry unit (CMU) block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, booster pump station piping. The building would also include electrical, a supervisory control and data acquisition (SCADA) computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the project site.

The project would also include construction of a fuel tank, transformer and pad, and drain box.

The project would include a three-million-gallon water storage tank, constructed of either welded steel or prestressed concrete, and a booster pump station. The proposed water storage tank would be approximately 35 feet tall, and a paved 20-foot-wide access area would border the circumference of the tank.

The booster pump station would have vertical turbine suction barrel pumps located inside a CMU block wall or pre-engineered metal building. Water from the pump station would discharge into an above-ground header pipe located within the building. From the header pipe, the piping would go below-grade and connect to the proposed distribution main in Hatch Road. Associated on-site infrastructure would include a drain line with a valve and blind flange.

Site improvements include construction of an 8-foot-tall exterior block wall, access gates, security monitors, 20-foot LED lighting fixtures, a 50-foot antenna tower, vehicle parking, and frontage landscaping.

All unused portions of the 1.84-acre well site would be covered with asphalt. Access to the project site would be provided by a new 20-foot-wide driveway via the future extension of East Cardella Road.

1.3.2 Stormwater

All unused portions of the 1.84-acre well site would be covered with asphalt. As a result, construction of the project would result in an increase of approximately 1.84 acres (or approximately 80,000 square feet) of new impervious surface within of the 4.01-acre project site. Stormwater retention/treatment features would include on-site catch basins, a storm drainage collection system, and a retention basin sized to retain all stormwater runoff for the Well 22 site.

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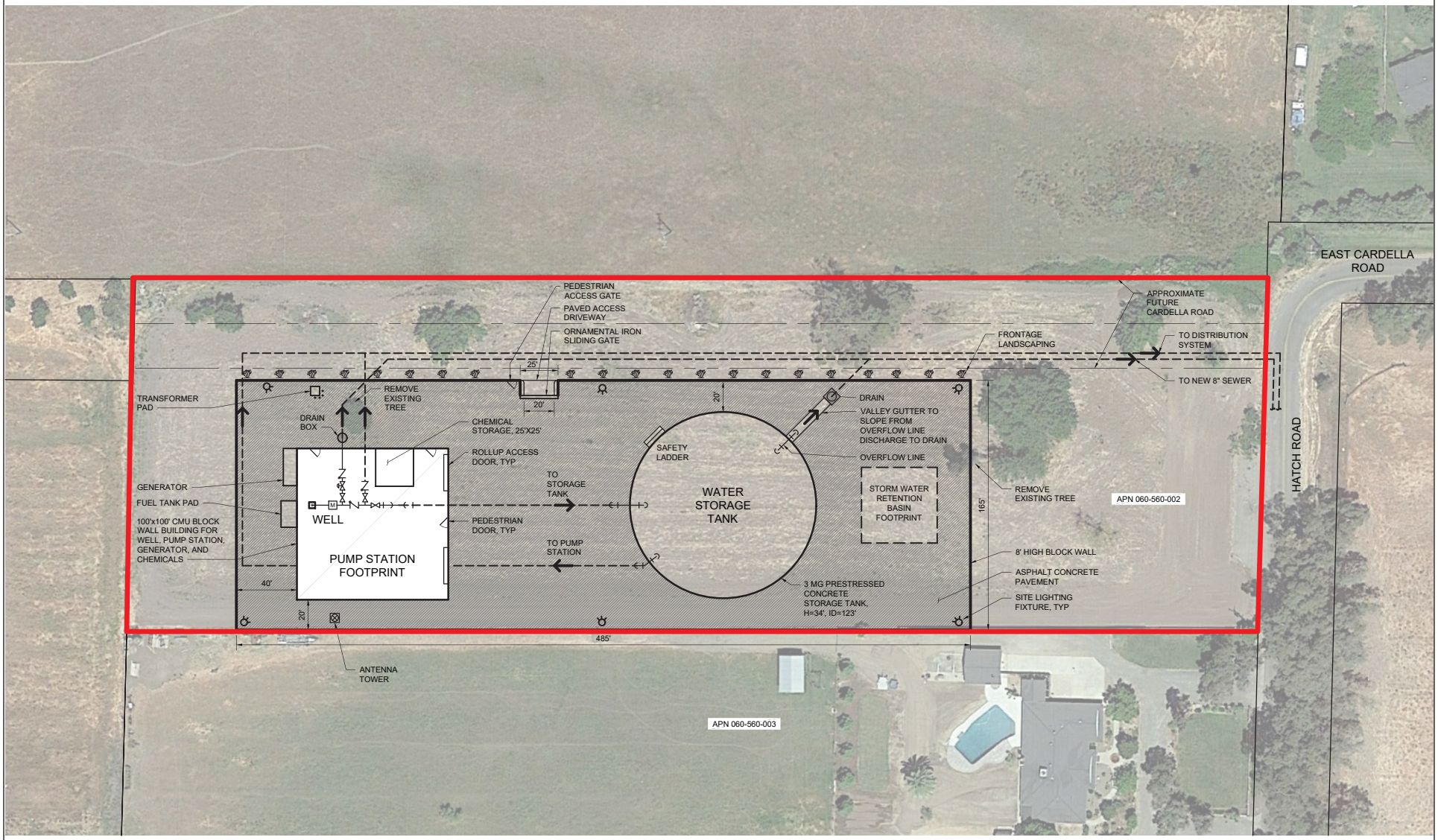

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FIGURE 3

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Project Site

Merced Municipal Well Site 22 Project
Conceptual Site Plan

SOURCE: MKN, 2019.

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1.3.3 Construction

The Well 22 project would be constructed in three phases, as described below.

1.3.3.1 Phase 1

Phase 1 would include the completion of a temporary test well: preparation of the well site area and grading to create a temporary bermed area to contain and percolate well development water; well drilling, test pumping, and water sampling for laboratory analysis. Overall construction of the Well 22 facilities under Phase 1 would occur over approximately 90 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 6 to 10 calendar days out of the 90 total work days.

1.3.3.2 Phase 2

Phase 2 would include the completion of the new municipal well. Construction activities would be initiated with installing and sealing a 34-inch conductor casing in a 48-inch diameter hole to an approximate depth of approximately 50 feet. This casing string would provide the primary sanitary protection of the well. The production borehole would be advanced though the conductor casing, and would be drilled at a diameter of 28-inches to a depth of approximately 600 feet. A casing assembly, consisting of 18-inch blank well casing and well screen, would be installed in the production borehole. An annular seal of cement grout would be installed to a depth of 200 feet or more. A gravel envelope from the annular seal to the borehole depth of approximately 600 feet would be installed around the well screen to retain the unconsolidated aquifer materials (sand and gravel) and allow sand-free production from the well. An engine-driven deep well turbine test pump would be installed for final well development and testing. As with Phase 1, well development water would be retained in a temporary bermed area. Overall construction of the Well 22 facilities under Phase 2 would occur over approximately 120 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

1.3.3.3 Phase 3

Phase 3 would include the completion of the new pump station including: installation of a new concrete masonry pump building, asphalt concrete paving, storm water basin, submersible well pump, station piping, water storage tank, backup diesel generator, fuel tank, system controls, electrical transformer, motor control panel, concrete masonry walls, security gates, yard lighting, and landscaping.

The construction of Phase 3 would take approximately 18 months.

The total time for completing all phases is estimated at 36 months, when allowing for the interim design period as well as contract bidding and start up for each construction phase. All work would be performed between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day, as noted above.

Construction of the project is anticipated to start in April 2021 and end in April 2024.

1.4 APPROVALS/PERMITS

While the City is the CEQA Lead Agency for the project, other agencies also have discretionary authority related to the project and approvals, or serve as a responsible and/or trustee agency in connection to the proposed project. A list of these agencies and potential permits and approvals that may be required is provided below.

- City of Merced, Certification of the EIR for the Municipal Well Site 22
- City of Merced, demolition, grading and building permit approval
- City of Merced approval for water, wastewater, and stormwater connections
- County of Merced approval of well permit
- PG&E electricity and gas connection approvals
- Central Valley Regional Water Quality Control Board (RWQCB), Stormwater Control Plan
- California State Water Resources Control Board Division of Drinking Water, Domestic Water Supply Permit
- San Joaquin Valley Air Pollution Control District, Portable Equipment Registration

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist in Chapter 3.0.

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

2.1 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated" impact on the environment, but at least one effect (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 ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature _____ Date 12/18/19

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3.0 CEQA ENVIRONMENTAL CHECKLIST

3.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
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 a 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?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

3.1.1 Impact Analysis

a. Would the project have a substantial effect on a scenic vista?

A scenic vista is generally defined as a public vantage point with an expansive view of a significant landscape feature. As described in the General Plan, the City of Merced has developed along routes and corridors which have come to be part of the City's identity.[2] The City has designated many of these scenic routes for special development review regulation. The project site is not included in the City's designated Scenic Corridors, as designated by Implementing Action 1.3.b of the General Plan.

The proposed well site is currently vacant and undeveloped. The proposed project would include the construction of Well 22 and a water storage tank. The project site is not readily visible from any scenic vista, nor would the proposed project block public views of a scenic vista. Therefore, the proposed project would have ***no impact.*** This topic will not be discussed in the EIR.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The California Department of Transportation's (Caltrans) Landscape Architecture Program administers the Scenic Highway Program, contained in the State Streets and Highways Code, Sections 260-263. State highways are classified as either Eligible for Scenic Designation, Officially Designated, or Connecting Federal Highway. Within Merced County, there are two Officially Designated State Scenic Highways (Interstate 5 [I-5; north of State Route 152 {SR 152}] and SR 52

[2] Merced, City of, 2012. *Merced Vision 2030 General Plan*. January 3.

[west of I-5]).[3] Both of these State Scenic Highways are located approximately 35 miles southwest of the project site. The project site is not visible from either State Scenic Highways; therefore, the proposed project does not have the potential to damage scenic resources from designated scenic highways, and will have ***no impact.*** This topic will not be discussed in the EIR.

c. In non-urbanized areas, would the project 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 a 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?

Following project construction, the visual impact of the proposed project would include a new 8-foot-tall exterior block wall, access gates, 20-foot LED lighting fixtures, a 50-foot antenna tower, and frontage landscaping. Within the exterior wall, a 10,000-square-foot building, constructed of CMU block or pre-engineered metal would house the well. In addition, an approximately 35-foot tall water storage tank would be constructed. The elements of the proposed project would be visible from Hatch Road or East Cardella Road and would be visible to residents living near the project site. However, existing vegetation, including street trees, located along Hatch Road or East Cardella Road and proposed frontage landscaping within the project site would limit public views of the site and its surroundings. Therefore, the proposed project would not substantially degrade the visual character or quality of public views of the site and its surroundings, and this impact would be ***less than significant***. This topic will not be discussed in the EIR.

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The proposed project would include low-level outdoor security lighting that would be fully shielded and would point down toward the ground. This would represent a new source of lighting; therefore, this impact would be potentially significant. However, implementation of Mitigation Measure AES-1, as required by the General Plan EIR, would reduce this impact to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

Mitigation Measure AES-1: The City shall implement the following measures related to lighting design:

- All outdoor lights including parking lot lights, landscaping, security, and path and deck lights shall be fully shielded, full cutoff luminaries.
- All up-lighting, for any purpose, shall be avoided.
- Tree-mounted lights shall be avoided unless they are fully shielded and pointing downward toward the ground or shining into dense foliage.

[3] Caltrans, 2019. Scenic Highways. Website: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed September 2019).

3.2 AGRICULTURE AND FORESTRY RESOURCES

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

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.2.1 Impact Analysis

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project site is classified as "Rural Residential Land" by the State Department of Conservation.[4] Therefore, development of the proposed project would not convert agricultural land to a non-agricultural use. The proposed project would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use and there would be ***no impact***. This topic will not be discussed in the EIR.

[4] California, State of, 2016. *Department of Conservation. California Important Farmland Finder.* Website: https://maps.conservation.ca.gov/dlrp/ciff/ (accessed September 2018).

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The project site is designated AR in the County of Merced 2030 General Plan and is within the A-R zoning district, which is intended to provide areas for rural residential development and hobby farming; and limited animal raising operations with less than a full range of urban services. This zoning district is typically intended to serve as a transitional area between more dense urban communities and agricultural uses with the option of allowing either one unit or three residential units per acre. The project site is not under a Williamson Act contract.[5] Therefore, the proposed project would have ***no impact***. This topic will not be discussed in the EIR.

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

As noted above, the project site is within the A-R zoning district, and is not zoned as forest land, timberland, or timberland production. As such, the proposed project would have ***no impact***. This topic will not be discussed in the EIR.

d. Would the project result in the loss of forest land or conversion of forestland to non-forest use?

Please refer to Section 3.2.1.a and 3.2.1.b. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest uses. Therefore, the proposed project would have ***no impact***. This topic will not be discussed in the EIR.

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

Please refer to Sections 3.2.1.a and 3.2.1.c. The project site is not currently used as farmland and would not result in the conversion of forestland to a non-forest use. The proposed project would not adversely affect agricultural or forestry resources and there would be ***no impact***. This topic will not be discussed in the EIR.

[5] Merced, County of, 2012. *2030 Merced County General Plan Update Draft Program Environmental Impact Report*. State Clearinghouse No. 2011041067. November.

3.3 AIR QUALITY

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

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

3.3.1 Impact Analysis

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

The City of Merced is part of the San Joaquin Valley Air Basin (SJVAB), which is within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD is responsible for air quality regulation within the eight-county San Joaquin Valley region.

Both the State and the federal government have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and suspended particulate matter ($PM_{2.5}$ and PM_{10}). The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the U.S. Environmental Protection Agency (USEPA) to identify regions as “attainment” or “nonattainment” depending on whether the regions meet the requirements stated in the applicable National Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The SJVAB attainment statuses for each of the criteria pollutants are listed in Table 3.A.

Table 3.A: SJVAB Air Quality Attainment Status

Pollutant	State	Federal
Ozone (1-hour)	Severe/Nonattainment	Standard Revoked
Ozone (8-hour)	Nonattainment	Extreme Nonattainment
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Attainment (Maintenance)
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Lead	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Regulation
Hydrogen Sulfide	Unclassified	No Federal Regulation

Source: San Joaquin Valley Air Pollution Control District (2016).

An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a non-attainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the SJVAPCD has developed the 2013 Plan for the Revoked 1-Hour Ozone Standard (Ozone Plan), adopted on September 19, 2013.[6] The SJVAPCD also adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.[7]

To assure the SJVAB's continued attainment of the USEPA PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007.[8] SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions) is designed to reduce PM_{10} emissions generated by human activity. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards in November 2018 to address the USEPA 1997 annual $PM_{2.5}$ standard of 15 µg/m^3 and 24-hour $PM_{2.5}$ standard of 65 µg/m^3, the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m^3, and the 2012 annual $PM_{2.5}$ standard of 12 µg/m^3.[9]

CEQA requires that certain proposed projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below,

6 San Joaquin Valley Air Pollution Control District, 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. September 19. Website: www.valleyair.org/Air_Quality_Plans/Ozone-OneHourPlan-2013.htm (accessed October 2019).

7 San Joaquin Valley Air Pollution Control District, 2016. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16. Website: www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed October 2019).

8 San Joaquin Valley Air Pollution Control District, 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. Available online at: www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed October 2019).

9 San Joaquin Valley Air Pollution Control District, 2018. *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards*. November 15. Website: http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed October 2019).

construction of the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of Mitigation Measure AIR-1 would further reduce construction dust impacts. Operational emissions associated with the proposed project would also not exceed SJVAPCD established significance thresholds. Therefore, the proposed project would not conflict with or obstruct implementation of SJVAPCD air quality plans and this impact would be ***less than significant with mitigation incorporated***. This topic will not be discussed in the EIR.

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards. The SJVAPCD's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SJVAPCD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The following analysis assesses the potential project-level construction- and operation-related air quality impacts.

Short-Term Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by grading, paving, building, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, Reactive Organic Gas (ROG), directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) such as diesel exhaust particulate matter.

Project construction activities would include grading, paving, and building activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SJVAPCD has implemented Regulation VIII measures for reducing fugitive dust emissions (PM_{10}). With the implementation of Regulation VIII measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, volatile organic compounds (VOCs) and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod, consistent with SJVAPCD recommendations. As identified in the Project Description, the Well 22 project would be constructed in three phases. Construction of the project is anticipated to start in April 2021 and end in April 2024. The total time for completing all phases is estimated at 36 months, which was included in the CalEEMod analysis. Construction-related emissions are presented in Table 3.B, below. CalEEMod output sheets are included in Appendix A.

Table 3.B: Project Construction Emissions (Tons per Year)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Project Construction Emissions	0.2	1.9	1.9	<0.1	0.6	0.3
SJVAPCD Significance Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (October 2019).

As shown in Table 3.B, construction emissions associated with the project would not exceed the SJVAPD's thresholds for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. These control measures are intended to reduce the amount of PM_{10} emissions during the construction period. Implementation of Mitigation Measure AIR-1 would ensure that the proposed project complies with Regulation VIII and further reduces the short-term construction period air quality impacts.

Mitigation Measure AIR-1 Consistent with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

- 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, covered with a tarp or other suitable cover 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 be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and 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 the end of each workday. (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.)
- Following the addition of materials to, or the removal of materials from, the surface of out-door storage piles, said piles shall be effectively stabilized of fugitive dust emission utilizing sufficient water or chemical stabilizer/suppressant.

As shown in Table 3.B, construction emissions associated with the project would be less than significant with implementation of Mitigation Measure AIR-1. Therefore, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS and impacts would be ***less than significant with mitigation incorporated***. This topic will not be discussed in the EIR.

Long-Term Operational Emissions. Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity), and area sources (e.g.,

landscape maintenance equipment use) related to the proposed project. The proposed project would also generate stationary source emissions associated with an emergency backup generator.

PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles.

Energy source emissions typically result from activities in buildings for which electricity and natural gas are used. The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Sources of energy demand for the proposed project could include mechanical systems, such as lighting, booster pumps, and process equipment. Area source emissions associated with the project would include emissions from the use of architectural coatings and maintenance equipment. The proposed project would also generate stationary source emissions associated with an emergency backup generator.

Emission estimates for operation of the project were calculated using CalEEMod and are shown in Table 3.C, below. For purposes of evaluating the proposed project, the county in CalEEMod was specified as Merced County and the climate zone of 3 was selected with the rural land use setting. Based on this climate zone, CalEEMod assumed a wind speed of 2.2 meters per second and precipitation frequency of 49 days per year. The operational year was assumed to be 2024. The utility company for the region was selected as Pacific Gas & Electric Company (PG&E) and the CO_2 intensity was determined to be 328.8 pounds per megawatt hour based on a 5-year average estimated by PG&E.

The CalEEMod analysis assumed 1.84 acres of General Light Industry land uses to account for Well 22, the water storage tank, and associated infrastructure. The project is anticipated to be operational in April 2024. This analysis assumes that one employee would visit the site daily, which would result in a total of two vehicle trips per day, which was included in the CalEEMod analysis. Where project-specific data were not available, default assumptions from CalEEMod were used to estimate project emissions. The annual emissions associated with project operational trip generation, energy, and area sources are identified in Table 3.C for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

Table 3.C: Project Operation Emissions (Tons per Year)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions	0.4	<0.1	<0.1	0.0	0.0	0.0
Energy Source Emissions	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Mobile Source Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Stationary Source Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Project Operation Emissions	**0.4**	**0.2**	**0.2**	**<0.1**	**<0.1**	**<0.1**
SJVAPCD Significance Threshold	10.0	10.0	100	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (October 2019).

As shown in Table 3.C, long-term operational emissions associated with the proposed project would be minimal and would be well below SJVAPCD significance thresholds. Therefore, the proposed project would not 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 AAQS and impacts would be ***less than significant***. This topic will not be discussed in the EIR.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road.

Construction activities associated with the proposed project would generate airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. However, construction contractors would be required to implement measures to reduce or eliminate emissions by following SJVAPCD Regulation VIII, as described above. Project construction emissions would be well below SJVAPCD significance thresholds. The proposed project would include an emergency backup generator; however, as identified in Table 3.C, project operational emissions of criteria pollutants would be below SJVAPCD significance thresholds; thus, they are not likely to have a significant impact on nearby residences given the distance and the dispersion that would occur. Compliance with SJVAPCD rules would further reduce potential health risk related to a level that is not significant. Therefore, nearby sensitive receptors would not be exposed to a risk that equals or exceeds 20 in one million in regards to carcinogenic TACs. In addition, nearby sensitive receptors would not be exposed to a risk that equals or exceeds a health index of 1 for non-carcinogenic TACs. Therefore, operation emissions from the project would not result in a substantial health risk. The proposed project would not expose sensitive receptors to substantial pollutant concentrations and impacts would be ***less than significant***. This topic will not be discussed in the EIR.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The SJVAPCD addresses odor criteria within the *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI).[10] The district has not established a rule or standard regarding odor emissions, rather, the district has a nuisance rule: "Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact."

During project construction, some odors may be present due to diesel exhaust. However, these odors would be temporary and limited to the construction period. The proposed project would not include any activities or operations that would generate objectionable odors and once operational, the project would not be a source of odors. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people and impacts would be ***less than significant***. This topic will not be discussed in the EIR.

[10] San Joaquin Valley Air Pollution Control District, 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19. Available online at: www.valleyair.org/transportation/GAMAQI_3-19-15.pdf (accessed October 2019).

3.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
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 U.S. Fish and Wildlife Service?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☒	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
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?	☐	☐	☐	☒

LSA conducted a biological resources evaluation for the proposed project, which is included as Appendix B, to assess the site for compliance with the CEQA review process.[11] The following summarizes the biological analysis for the proposed project.

Methods. For purposes of the biological analysis, a Biological Study Area (BSA) was established. The BSA, totaling approximately 4 acres, is located in the Central Valley, which is characterized by large flat areas of agricultural farmland, within the SOI of the City of Merced in Merced County. The BSA is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to 3 acres in size. Single-family homes are located directly south and northeast of the project site. The BSA itself is composed entirely of ruderal areas.

A list of sensitive wildlife and plant species potentially occurring within the BSA was compiled to evaluate the potential impacts resulting from project construction. Sources used to compile the list include the California Natural Diversity Database (CNDDB), the U.S. Fish and Wildlife Service

[11] LSA Associates, Inc., 2019. *Biological Resources Evaluation for the Merced Municipal Well Site 22 Project, Merced County, California*. November 20.

(USFWS) online special-status species list, and the California Native Plant Society (CNPS) Online Edition. The species lists obtained from the CNDDB, CNPS, and USFWS were reviewed to determine which species could potentially occur in the project area.

LSA conducted a general field survey within the BSA on September 26, 2019.

Environmental Setting. The entire BSA consists of ruderal areas, totaling 4.01 acres. Ruderal areas within the BSA are heavily influenced by human activities and are dominated by a variety of pioneering species including Italian rye grass (*Festuca perennis*), prickly lettuce (*Lactuca serriola*), charlock mustard (*Sinapis arvensis*), pigweed amaranth (*Amaranthus albus*), prostrate amaranth (*Amaranthus blitoides*), lamb's quarters (*Chenopodium album*), and silver leaved horsenettle (*Solanum elaeagnifolium*), among others.

It is worth noting that the BSA previously contained a residential structure which was demolished between 2009 and 2010. As a result of this historic land use, the BSA also contains relic landscape plantings in the form of existing trees and shrubs which make up the overstory component of the site. Tree species observed within the BSA include white mulberry (*Morus alba*), black locust (*Robinia pseudoacacia*), red gum (*Eucalyptus camaldulensis*), edible fig (*Ficus carica*), silver dollar gum (*Eucalyptus polyanthemos*), and deodar cedar (*Cedrus deodara*).

The BSA does not contain any sensitive habitats, potentially jurisdictional aquatic features, or appropriate habitat for special-status plant species. No special-status plants were observed during the field survey.

An unnamed tributary to Cottonwood Creek and the Yosemite Lateral, located approximately 0.15 mile west and 0.16 mile east, respectively, are the nearest aquatic features.

Burrowing Owl. Burrowing owl is designated by the California Department of Fish and Wildlife as a Species of Special Concern. This species inhabits areas with low vegetation in agricultural fields, grasslands, and desert communities and also occurs in urban and suburban areas subject to regular human disturbance. Burrowing owls require fossorial mammal burrows, typically those created by California ground squirrels (*Otospermophilus beecheyi*), for escape cover and nesting. However, piles of rock, concrete debris, and other materials are also used in lieu of burrows. The breeding season occurs from February 1 to August 31, and peaks between late April and July in most years.

Although no burrowing owls or sign were observed during the field survey, numerous ground squirrel burrows occur in the northern portion of the BSA underneath existing trees, primarily black locust and white mulberry. These burrows provide suitable nesting habitat for this species, and adjacent grazing fields north of the BSA provide ideal foraging habitat. Ruderal areas within the BSA would also provide moderately suitable foraging habitat for burrowing owls. The nearest CNDDB occurrence is located approximately 1.3 miles northeast of the BSA across from the University of California, Merced campus. Therefore, there is high potential for burrowing owls to occur within the BSA.

Swainson's Hawk. Swainson's hawk is designated as athreatened species under the California Endangered Species Act (CESA). Swainson's hawks are open-country birds that nest in the Central

Valley of California. Nests are typically found in scattered trees or along riparian corridors adjacent to annual grasslands, pastures, alfalfa, and other crops that provide foraging habitat. Agricultural areas are most often used by foraging Swainson's hawks just after harvest or irrigation when prey populations become exposed or brought to the surface. Swainson's hawks forage primarily on small rodents and reptiles during the breeding season (March to July), and on insects during the non-breeding period. Swainson's hawks typically migrate to and overwinter in South America between September and February, returning to North America in the spring to nest.

Two red tailed hawks (*Buteo jamaicensis*) were observed foraging over grazing lands south of the BSA during the field survey, however no Swainson's hawks were observed. No suitable nest trees are located within the BSA, however suitable nest trees occur east of the BSA on the parcel located on the east side of Hatch Road, consisting primarily of eucalyptus trees. No large stick nests were observed in any of these trees during a window survey of the area. Grazing lands and ruderal habitats within and adjacent to the BSA provide suitable foraging habitat for this species. The nearest extant CNDDB occurrence of Swainson's hawk is located approximately 2.66 miles southeast of the BSA. Although there is potential for Swainson's hawks to nest adjacent to the BSA, the location of suitable nest trees on residential lots will likely deter nesting due to human activity. Swainson's hawks are unlikely to nest in or adjacent to the BSA.

San Joaquin Kit Fox. San Joaquin kit fox (SJKF) is listed as an endangered species under the federal Endangered Species Act and the CESA. SJKF has declined throughout its range primarily due to habitat loss, but other possible factors include predator and pest control programs and competition, primarily with coyotes. SJKF inhabits valley and foothill grasslands, sparsely vegetated shrubby habitats, and some agricultural and urban areas. Habitats most frequently used by the species are comprised mostly of grassland and saltbush scrub. SJKF use complex dens for shelter and protection, most of which are located in flat terrain or on the lower slopes of hills. Common locations for dens include washes, drainages, and roadside berms. Kit foxes are reputed to be poor diggers and are usually found in areas with loose-textured, friable soils. Some studies have suggested that where hardpan layers predominate, kit foxes create dens by enlarging California ground squirrel or American badger (*Taxidea taxus*) burrows. They also commonly den in man-made structures such as small-diameter culverts. Kit fox are quite tolerant of human disturbances and will, to an extent, use oil fields and cultivated agricultural lands. A diet of small rodents such as kangaroo rats and California ground squirrels is common for this species.

No SJKF were observed during the field survey, however potentially suitable denning habitat for this species occurs within the BSA underneath a black locust tree. Several burrows at the base of the tree were large enough to potentially accommodate SJKF, and adjacent grazing fields provide suitable foraging habitat. The nearest CNDDB occurrence is located approximately 3.6 miles east of the BSA in an undeveloped area adjacent to agricultural operations. Although potentially suitable denning and foraging habitat is present within the BSA, it is unlikely that SJKF would disperse through the area given the nature of surrounding land uses (agricultural, developed, rural residential) and the proximity of more suitable habitat for this species. Furthermore, no project impacts are proposed to the northern portion of the BSA. Therefore, based on the proximity of more suitable SJKF habitat in the vicinity, the low number of nearby occurrences, and the generally

developed nature of habitat within and surrounding the BSA, there is low potential for SJKF to occur within the BSA.

Nesting Birds. The BSA provides suitable nesting habitat for a number of bird species protected under Section 3503 of the California Fish and Game Code; however, the survey was conducted outside of the nesting bird season. The following bird species were observed and may nest within the BSA: American kestrel (*Falco sparverius*), song sparrow (*Melospiza melodia*), northern mockingbird (*Mimus polyglottos*), western bluebird (*Sialia mexicana*), and mourning dove (Zenaida macroura).

3.4.1 Impact Analysis

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

Ground-disturbing activities and tree removal associated with the proposed project have the potential to affect burrowing owls and nesting bird species that could occur within the BSA. Disturbance of burrowing owls and their habitat of migratory birds during their nesting season (February 1 to August 31) could result in "take" which is prohibited under the MBTA and Section 3513 of the CFGC. CFGC Section 3503 also prohibits take or destruction of bird nests or eggs. However, adherence to the requirements in Mitigation Measure BIO-1, described below, would ensure potential impacts to nesting birds would result in a ***less-than-significant impact with mitigation.*** This topic will not be discussed in the EIR.

Mitigation Measure BIO-1: The following measures shall be implemented to reduce potential impacts to nesting birds:

- If tree removal occurs during the nesting season (February 1 – August 31), a qualified biologist shall conduct a preconstruction survey for burrowing owl and other nesting birds in the BSA no more than 10 days prior to the start of construction. Pre-construction surveys for burrowing owl shall be conducted in accordance with the California Department of Fish and Wildlife's (CDFW) 2012 Staff Report on Burrowing Owl Mitigation.

- If any active bird nests are discovered within the BSA, a qualified biologist shall evaluate the potential for the work activities to disturb typical nesting behavior of the birds and establish protective buffers, if necessary, based on this evaluation.

- If any active nests of special-status bird species (such as burrowing owl) are discovered within or less than 500 feet of

the BSA, a minimum 500 foot buffer shall be established. If any work is proposed within this buffer, CDFW shall be notified, and shall have the authority to reassess protective buffers and/or establish other avoidance and minimization measures.

- Disturbance of active nests shall be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged, or the nest has failed. If work is allowed to proceed, a qualified biologist shall be on-site during the start of construction activities to monitor nesting activity. The biologist shall have the authority to stop work if it is determined that the construction activities are adversely affecting nesting activities.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

As noted above, no riparian habitat or other sensitive natural communities occur in the BSA. Therefore, ***no impact*** would occur, and this topic will not be discussed in the EIR.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

As noted above, no aquatic resources occur with the BSA, and no potential wetlands are located within the BSA. As a result, ***no impact*** would occur, and this topic will not be discussed in the EIR.

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

As noted above, the ground disturbing or tree removal activities associated with the proposed project could have a potentially significant impact related to resident or migratory nesting birds and burrowing owls. However, implementation of Mitigation Measure BIO-1 would ensure this impact would be ***less-than-significant with mitigation.*** This topic will not be discussed in the EIR.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The project would not conflict with any local policies or ordinances protecting biological resources. Though the proposed project does fall within the County of Merced, the County does not have a tree preservation policy or ordinance, and the proposed project would not conflict with any other existing ordinance protection biological resources. As a result, ***no impact*** would occur, and this topic will not be discussed in the EIR.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Pacific Gas & Electric (PG&E) San Joaquin Valley Operation and Maintenance (O&M) Habitat Conservation Plan (HCP)[12] was approved in 2007 and covers portions of nine counties, including Merced County and the City of Merced. This HCP covers PG&E activities which occur as a result of ongoing O&M that would have an adverse impact on any species covered by the HCP. The HCP also provides incidental take coverage from the USFWS and CDFW. The project site is not located within the covered area of any other HCP, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Mitigation Measure BIO-1, for potential impacts to burrowing owls and nesting birds, is largely consistent with Avoidance and Minimization Measure 22 in the PG&E HCP.[13] Therefore, the project would not conflict with the provisions of the PG&E HCP and the proposed project and would have ***no impact***. This topic will not be discussed in the EIR.

3.5 CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

LSA conducted a cultural resources study for the proposed project to assess the site for compliance with the CEQA review process.

3.5.1 Impact Analysis

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

A historical resource defined by CEQA includes one or more of the following criteria: 1) the resource is listed, or found eligible for listing in, the California Register of Historical Resources (CRHR); 2) listed in a local register of historical resources as defined by Public Resources Code (PRC) Section 5020.1(k); 3) identified as significant in a historical resources survey meeting the requirements of PRC Section 5024.1(g); or 4) determined to be a historical resource by the project's lead agency (PRC

[12] Pacific Gas & Electric, 2007, PG&E San Joaquin Valley Operation & Maintenance Habitat Conservation Plan. November.

[13] Ibid.

Section 21084.1; CEQA Guidelines Section 15064.(a)). Under CEQA, historical resources include built-environment resources and archaeological sites.

The cultural resources study found that no historical resources were identified within or adjacent to the project site. However, the City has determined that impacts to cultural resources could occur as a result of development, and that unknown archaeological materials may be present. Although no evidence of archeological deposits have been identified, there is a potential for unknown archaeological resources that qualify as a historical resource under CEQA to be discovered during construction. Mitigation Measure CUL-1 requires that if unknown archaeological resources are discovered during construction, work in the area would halt and a qualified archaeologist would be contacted. Therefore, adherence to the requirements in Mitigation Measure CUL-1 would reduce potential impacts to unknown archaeological historical resources to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

Mitigation Measure CUL-1: If unknown pre-contact or historic-period archaeological materials are encountered during project activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations.

Cultural resources materials may include pre-contact resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock, as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations shall be required to mitigate adverse impacts from project implementation. These additional studies may include, but are not limited to recordation, archaeological excavation, or other forms of significance evaluations.

The City shall inform its contractor(s) of the sensitivity of the project site for archaeological deposits, and include the following directive in the appropriate contract documents:

"The subsurface of the construction site is sensitive for archaeological deposits. If archaeological deposits are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist shall assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any archaeological materials. Archaeological deposits can include, but are not limited to, shellfish remains; bones, including human remains; flakes of, and tools made from, obsidian, chert, and basalt; mortars and pestles; historical trash deposits containing glass, ceramics, and metal artifacts; and structural remains."

The City shall verify that the language has been included in the grading plans prior to issuance of a grading permit or other permitted project action that includes ground-disturbing activities on the project site.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

According to the CEQA Guidelines, "When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (CEQA Guidelines Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as "unique archaeological resources" (California PRC Section 21083.2). No archaeological resources were identified in the project site. However, there is a potential for unknown archaeological resources to be discovered during construction. Mitigation Measure CUL-1 requires that if unknown archaeological resources are discovered during construction, work in the area would halt and a qualified archaeologist would be contacted. Therefore, adherence to the requirements in Mitigation Measure CUL-1 would reduce potential impacts to archaeological resources to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

c. Would the project disturb any humans remains, including those interred outside of formal cemeteries?

Disturbance of human remains interred outside of formal cemeteries would result in a significant impact. If human remains are identified during project construction, Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code shall apply, as appropriate. Therefore, implementation of Mitigation Measure CUL-2 would reduce potential impacts to human remains to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

Mitigation Measure CUL-2: If human remains are identified during construction and cannot be preserved in place, the City shall fund 1) the removal and documentation of the human remains from the project corridor by a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology, 2) the scientific analysis of the remains by a qualified archaeologist, should such analysis be permitted by the Native American Most Likely Descendant, and 3) the reburial of the remains, as appropriate. All excavation, analysis, and reburial of Native American human remains shall be done in consultation with the Native American Most Likely Descendant, as identified by the California Native American Heritage Commission.

3.6 ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

3.6.1 Impact Analysis

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?

The proposed project would increase the demand for electricity and natural gas. The discussion and analysis provided below is based on data included in the CalEEMod output, which is included in Appendix A.

Construction-Period Energy Use. The anticipated construction schedule assumes that the proposed project would be built over 36 months. The proposed project would require site preparation, grading, drilling and well construction, trenching, foundation, building construction, pump installation, and paving activities during construction.

Construction of the proposed project would require energy for the manufacture and transportation of construction materials, preparation of the site for grading and building activities, and construction of the building. All or most of this energy would be derived from non-renewable resources. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities. However, construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. Energy (i.e. fuel) usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Construction of the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources and construction-related impacts would be ***less than significant***. This topic will not be discussed in the EIR.

Operational Energy Use. Energy use consumed by the proposed project would be associated with natural gas use and electricity consumption associated with the project. Energy and natural gas consumption was estimated for the project using default energy intensities by land use type in CalEEMod.

Based on CalEEMod, the estimated potential increased electricity demand associated with the proposed project is 705,600 kilowatt-hours (kWh) per year. In 2018, California consumed

approximately 281,120 gigawatt-hours (GWh) (281,120,193,430 kWh).[14] Of this total, Merced County consumed 3,558 GWh or 3,558,916,991 kWh.[15] Therefore, electricity demand associated with the proposed project would only be approximately 0.02 percent of Merced County's total electricity demand.

In addition, based on CalEEMod, the estimated potential increased natural gas demand associated with the proposed project is 16,700 therms per year. In 2018, California consumed approximately 12,638 million therms or 12,638,157,740 therms, while Merced County consumed approximately 120 million therms or approximately 120,304,563 therms.[16] Therefore, natural gas demand associated with the proposed project would only be approximately 0.01 percent of Merced County's total natural gas demand.

Due to the minimal electricity demand associated with the proposed project, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of fuel or energy and would incorporate renewable energy or energy efficiency measures into building design, equipment use, and transportation. Therefore, construction and operation period impacts related to consumption of energy resources would be ***less than significant***. This topic will not be discussed in the EIR.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

In 2002, the Legislature passed Senate Bill 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every two years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero emission vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

The CEC is in the process of adopting the 2019 Integrated Energy Policy Report.[17] The 2019 Integrated Energy Policy Report provides results from the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2019 Integrated Energy Policy Report covers a broad range of topics, including

[14] California Energy Commission. 2018. Energy Consumption Data Management Service. Electricity Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/elecbycounty.aspx. (Accessed October 2019).

[15] Ibid.

[16] California Energy Commission. 2018. Energy Consumption Data Management Service. Gas Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/gasbycounty.aspx. (Accessed October 2019).

[17] California Energy Commission, 2019. *2019 Integrated Energy Policy Report.* California Energy Commission. Docket # 19-IEPR-01.

implementation of Senate Bill 350, integrated resource planning, distributed energy resources, transportation electrification, solutions to increase resiliency in the electricity sector, energy efficiency, transportation electrification, barriers faced by disadvantaged communities, demand response, transmission and landscape-scale planning, the California Energy Demand Preliminary Forecast, the preliminary transportation energy demand forecast, renewable gas (in response to Senate Bill 1383), updates on electricity reliability, natural gas outlook, and climate adaptation and resiliency.

As indicated above, energy usage on the project sites during construction would be temporary in nature. In addition, energy usage associated with operation of the proposed project would be relatively small in comparison to the State's available energy sources and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the project's total impact to regional energy supplies would be minor, the proposed project would not conflict with California's energy conservation plans as described in the CEC 2019 Integrated Energy Policy Report. Thus, as shown above, the project would avoid or reduce the inefficient, wasteful, and unnecessary consumption of energy and not result in any irreversible or irretrievable commitments of energy. Therefore, the proposed project would not result in the wasteful, inefficient or unnecessary consumption of energy resources during project construction or operation. Impacts would be ***less than significant***. This topic will not be discussed in the EIR.

3.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
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?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

3.7.1 Impact Analysis

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

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

ii. Strong seismic ground shaking?

iii. Seismic-related ground failure, including liquefaction?

iv. Landslides?

Fault Rupture. Fault rupture is generally expected to occur along active fault traces that have exhibited signs of recent geological movement (i.e., within the last 11,000 years). Alquist-Priolo Earthquake Fault Zones delineate areas around active faults with potential surface fault rupture hazards that would require specific geological investigations prior to approval of certain kinds of development within the delineated area. The project site is not located within an Alquist-Priolo

Earthquake Fault Zone.[18] In addition, no known active or potentially active faults or fault traces are located in the project vicinity.

The closest active faults are the Kings Canyon Lineament, located approximately 10.5 miles southwest of the project site, the San Joaquin Fault, located approximately 30 miles west of the project site, Melones Fault System, located approximately 40 miles east of the project site, and the Vernalis Fault, located approximately 45 miles northwest of the project site.[19] Due to the distance of these known faults, no people or structures would be exposed to potential substantial adverse effects, including the risk of loss, injury, or death from the rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, and this would be considered a ***less-than-significant impact***. This topic will not be discussed in the EIR.

Seismic Ground Shaking. Merced is vulnerable to shaking from a number of faults that run through the mountains to the east and west of the City. As discussed above, the closest known active faults are the Kings Canyon Lineament, located 10 miles southwest of the project site, San Joaquin Fault System, located approximately 30 miles west of the project site, Melones Fault System, located approximately 40 miles east of the project site, and Vernalis Fault, located approximately 45 miles northwest of the project site. According to the City's General Plan, the most likely hazard associated with earthquakes for the Merced area is ground shaking, rather than surface rupture or ground failure.[20] As a result, impacts related to seismic ground shaking would be ***less than significant***, and this topic will not be discussed in the EIR.

Seismic Ground Failure. The potential for different types of ground failure to occur during a seismic event is discussed below.

Liquefaction. Soil liquefaction is a phenomenon primarily associated with saturated soil layers located close to the ground surface. During ground shaking, these soils lose strength and acquire "mobility" sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, uniformly graded, saturated, fine-grained sands that lie relatively close to the ground surface. However, loose sands that contain a significant amount of fines (silt and clay) may also liquefy. Based on the predicted seismic accelerations, and soil and groundwater conditions typically encountered in the region, general liquefaction potential is low in Merced.[21] As a result, impacts related to liquefaction would be ***less than significant***, and this topic will not be discussed in the EIR.

Lateral Spreading. Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surface soils are transported downslope or in the direction of a free face by earthquake and gravitational forces. The project site is relatively flat and development of the proposed project

18 California Geologic Survey, 2019. EQ Zapp: California Earthquake Hazards Zone Application. Website: https://www.conservation.ca.gov/cgs/geohazards/eq-zapp (accessed September 2019).
19 California Department of Conservation, 2015. Fault Activity Map of California (2010). Website: http://maps.conservation.ca.gov/cgs/fam/ (accessed September 2019).
20 Merced, City of, 2012. *Merced Vision 2030 General Plan*. January 3.
21 Merced, City of, 2010. General Plan EIR, page 3.6-3. August.

would not exacerbate lateral spreading. Therefore, the proposed project would have a ***less-than-significant*** impact related to lateral spreading. This topic will not be discussed in the EIR.

Landslides. A landslide generally occurs on relatively steep slopes and/or on slopes underlain by weak materials. The project site is located on a relatively flat area and is not located next to any hills. In general, the potential for land sliding or slope failure in the vicinity of the city of Merced is very low and would not be susceptible to landslides.[22] Therefore, the potential for the proposed project to expose people or structures to risk as a result of landslides would be ***less than significant***. This topic will not be discussed in the EIR.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Topsoil is defined as the upper part of the soil profile that is relatively rich in humus and is technically known as the A-horizon of the soil profile.[23] Grading and earthmoving during project construction has the potentially to result in erosion and loss of topsoil. Exposed soils could be entrained in stormwater runoff and transported off the project site. The soil type at the project site is Raynor cobbly clay and Redding gravelly loam, which generally have a low erosion potential.[24] City of Merced General Plan Policy P5-1 states that the City will provide effective storm drainage facilities for future development. Similarly, the County of Merced General Plan includes Policy PFS-3.2 that requires new development in unincorporated communities to include adequate stormwater drainage systems including adequate capture, transport, and detention/retention of stormwater. Before ground-disturbing construction activities, the City will be responsible for developing and implementing Best Management Practices that will be used to reduce or eliminate pollutants in stormwater discharges from the project site which may include the following: use of wattles, silt fencing, and stabilization of construction entrances to minimize trackout. As such, the proposed project would have a ***less-than-significant impact***. This topic will not be discussed in the EIR.

c. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

As described in Section 3.7.1.a, soils on the project site would not be subject to liquefaction, lateral spreading, or landslides. Additionally, the proposed project would be required to conform with the California Building Code, which would reduce risks related to unstable soils. Therefore, the proposed project would have a ***less-than-significant impact*** related to unstable soils. This topic will not be discussed in the EIR.

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22 Ibid.

23 California State Mining and Geology Board, 2014. Surface Mining Reclamation Act Regulations. California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

24 Natural Resources Conservation Service, 2017. *Web Soil Survey*. Website: websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx (accessed September 2019).

d. Would the project 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?

Expansive soils are characterized by the potential for shrinking and swelling as the moisture content of the soil decreases and increases, respectively. Shrink-swell potential is influenced by the amount and type of clay minerals present and can be measured by the percent change of the soil volume.[25] Portions of the soils at the project site contain clay, and therefore have shrinking and swelling potential. However, compliance with the California Building Code requirements would ensure that geotechnical design of the proposed project would reduce potential impacts related to expansive soils to a less-than-significant level. As such, the risk of expansive soil affecting the proposed project is considered low and would represent a ***less-than-significant impact***. This topic will not be discussed in the EIR.

e. Would the project 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?

Development of the proposed project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, the proposed project would have ***no impact*** related to septic tanks or alternative waste water disposal systems. This topic will not be discussed in the EIR.

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

The project involves earthmoving activities that take place within the Mehrten Formation, a paleontologically sensitive rock formation. The proposed project has the potential to damage or destroy unique paleontological resources, resulting in a potentially-significant impact to paleontological resources. However, implementation of Mitigation Measure GEO-1 would reduce this impact to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

Mitigation Measure GEO-1: The City shall implement the following measures related to paleontological resources:

- Before the start of grading or excavation activities, construction personnel involved with earth-moving activities shall be informed of the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction activities, and proper notification procedures should fossils be encountered.
- This worker training shall be prepared and presented by a qualified paleontologist.

[25] Ibid.

- If paleontological resources are discovered during earth-moving activities, the construction crew shall immediately cease work in the vicinity of the find and shall notify the City planning department. The City shall retain a qualified paleontologist to evaluate the resource in accordance with the "Society of Vertebrate Paleontology Guidelines" (Society of Vertebrate Paleontology 1995).

3.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.8.1 Impact Analysis

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

Greenhouse gas emissions (GHGs) are present in the atmosphere naturally, and are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. However, over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global climate change. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons
- Perfluorocarbons
- Sulfur Hexafluoride

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another

gas. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time that the gas remains in the atmosphere ("atmospheric lifetime").

The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

The SJVAPCD *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*[26] suggests project GHG emissions would be considered less than significant if a project meets any of the following conditions: is exempt from CEQA requirements; complies with an approved GHG emission reduction plan or GHG mitigation program; or implements Best Performance Standards. Additionally, projects that demonstrate that GHG emissions would be reduced or mitigated by at least 29 percent compared to Business-as-Usual, including GHG emission reductions achieved since the 2002-2004 baseline period, would be considered less than significant.

This section discusses the project's impacts related to the release of GHG emissions for both construction and operational phases of the project.

Construction Greenhouse Gas Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that construction of the project would generate a total of approximately 923.3 metric tons of CO_2e. When considered over the 30-year life of the project, the total amortized construction emissions would be 30.8 metric tons of CO_2e per year. As such, construction of the proposed project would not generate GHG emissions that would have a significant impact on the environment and construction-related impacts would be ***less than significant***. This topic will not be discussed in the EIR.

Operational Greenhouse Gas Emissions. Long-term GHG emissions are typically generated from mobile, area, waste, and water sources as well as indirect emissions from sources associated with energy consumption. Mobile-source GHG emissions would include project-generated trips to and from the project site. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions are typically generated at off-site

[26] San Joaquin Valley Air Pollution Control District, 2009. *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA*. December 17. Available online at: www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf (accessed October 2019).

utility providers as a result of increased electricity demand generated by a project. Stationary source emissions would be associated with the emergency backup generator. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by pumping of water, water treatment, water distribution, and wastewater treatment.

Operational emissions were estimated using CalEEMod and the results are presented in Table 3.D. CalEEMod output sheets are included in Appendix A.

Table 3.D: Operational GHG Emissions

Emissions Source Category	Operational Emissions (Metric Tons per Year)				
	CO_2	CH_4	N_2O	CO_2e	Percent of Total
Area	<0.1	0.0	0.0	<0.1	0
Energy	194.3	<0.1	<0.1	195.7	68
Mobile	6.3	<0.1	0.0	46.4	16
Stationary	1.7	<0.1	0.0	1.7	1
Waste	2.0	0.1	0.0	5.0	1
Water	20.8	0.6	<0.1	40.2	14
Total Operational				**289.0**	**100**

Source: LSA (October 2019).

The proposed project would generate approximately 289.0 metric tons of CO_2e per year of emissions, as shown in Table 3.D. The SJVAPCD has not established a numeric threshold for GHG emissions. The project would include the construction a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the DDW Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations. Based on the emission estimates shown in Table 3.D, the proposed project would generate minimal GHG emissions and therefore would not result in the generation of substantial GHG emissions. As such, operation of the proposed project would result in ***a less-than-significant impact*** related to the generation of GHG emissions. This topic will not be discussed in the EIR.

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

The County of Merced is currently developing a Climate Action Plan (CAP), which is a strategy for how it will reduce its greenhouse gas emissions in accordance with statewide targets. The SJVAPCD has adopted a CCAP, which includes suggested BPS for proposed development projects. Appendix J of the SJVAPCD Final Staff Report for the CCAP contains GHG reduction measures; however these measures are intended for commercial, residential, and mixed-use projects and wouldn't be applicable to the proposed project.

As discussed above, the proposed project would include the construction of a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the DDW Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations. The GHG reduction opportunities included in the CAP are intended for new commercial, residential, and mixed-use development projects and wouldn't be applicable to the proposed project. Therefore, the following discussion evaluates the proposed project according to the goals of Assembly Bill (AB) 32, the AB 32 Scoping Plan, Executive Order B-30-15, Senate Bill (SB) 32, and AB 197.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 requires CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

Executive Order Executive Order B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[27] to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, Executive Order B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as discussed below.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. Energy usage associated with operation of the proposed project would be relatively small in comparison to the State's available energy sources and energy impacts would be negligible at the regional level. Therefore, the proposed project would not conflict with applicable energy measures.

[27] California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan*. November.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. The purpose of the project is to construct a new municipal water supply well and pumping station following the removal of service of Well 7B due to elevated nitrate concentrations. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. In addition, as discussed above, this analysis assumes that one employee would visit the site daily, which would result in a total of two vehicle trips per day; therefore, the project would result in minimal additional vehicle trips and would not conflict with reduction targets for passenger vehicles. Therefore, the proposed project would not conflict with policies and regulations that have been adopted for the purpose of reducing GHG from transportation sources.

The proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197 and would be consistent with applicable state plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs and impacts would be ***less than significant***. This topic will not be discussed in the EIR.

3.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
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?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
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?	☐	☐	☐	☒
e. For a project 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, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

3.9.1 Impact Analysis

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction activities associated with the proposed project would involve the use of limited amounts of potentially hazardous materials, including but not limited to, solvents, paints, fuels, oils, and transmission fluids. However, all materials used during construction would be contained, stored, and handled in compliance with applicable standards and regulations established by the Department of Toxic Substances Control (DTSC), the USEPA, and the Occupational Safety and Health Administration (OSHA). No manufacturing, industrial, or other uses utilizing large amounts of hazardous materials would occur within the project site. Project operation would involve the use of small quantities of commercially-available hazardous materials (e.g., paint, cleaning supplies) that could be potentially hazardous if handled improperly or ingested. However, these products are not considered acutely hazardous and are not generally considered unsafe. All storage, handling, and disposal of hazardous materials during project construction and operation would comply with applicable standards and regulations. The proposed commercial uses would not generate significant amounts of any hazardous materials. Therefore, the proposed project would have a ***less-than-***

significant impact associated with the routine transport, use, or disposal of hazardous materials, and no mitigation is required. This topic will not be discussed in the EIR.

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

See Section 3.9.1.a above. The proposed project would not result in a significant hazard to the public or the environment through a reasonably foreseeable upset or accident condition related to the release of hazardous materials. This impact would be considered ***less than significant***, and this topic will not be discussed in the EIR.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest existing school is Providence Christian School, located approximately 0.8 mile south of the project site. Additionally, Cruickshank Middle School is located approximately 1 mile southwest of the project site. As previously stated, the proposed project would not result in the use or emission of substantial quantities of hazardous materials that would pose a human or environmental health risk. In addition, all materials would be handled, stored, and disposed of in accordance with applicable standards and regulations. Therefore, because the proposed project does not involve activities that would result in the emission of hazardous materials or acutely hazardous substances, implementation of the proposed project would result in a ***less-than-significant impact*** in the use or emission of hazardous materials that would adversely affect an existing school. This topic will not be discussed in the EIR.

d. Would the project 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?

According to the DTSC EnviroStor database,[28] the project site is not located on a federal superfund site, State response site, voluntary cleanup site, school cleanup site, evaluation site, school investigation site, military evaluation site, tiered permit site, or corrective action site. The project site is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[29] As a result, no impacts related to this issue are anticipated, and no mitigation is required. There would be ***no impact***, and this topic will not be discussed in the EIR.

[28] California Department of Toxic Substances Control, 2019. EnviroStor. Website: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=3987+Hatch+Road%2C+Merced (accessed September 2019).

[29] California Environmental Protection Agency, 2019. Cortese List Data Resources. Website: https://calepa.ca.gov/sitecleanup/corteselist/

e. Would the project be 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, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

The proposed project is not located within 2 miles of a public airport or a public use airport and is not within an airport land use plan. The nearest airports include Merced Regional Airport, located approximately 5.4 miles southwest of the project site, and Castle Airport, located approximately 6.2 miles northwest of the project site. Operations at Merced Regional Airport and Castle Airport are not expected to pose a safety hazard for people working at or visiting the project site. Therefore, implementation of the proposed project would not expose persons to airport-related hazards, and ***no impact*** would occur. This topic will not be discussed in the EIR.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Implementation of the proposed project would result in improvements to water system infrastructure. The proposed project would not modify or block any evacuation route, nor would it interfere with an emergency response plan. ***No impact*** would occur, and this topic will not be discussed in the EIR.

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Refer to Section 3.20, Wildfire. The project site is not located within a high or very high fire hazard severity zone. Therefore, the proposed project would not expose people or structure to significant risk of loss, injury, or death involving wildland fires. Therefore, this impact would be ***less than significant***, and this topic will not be discussed in the EIR.

3.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☒	☐	☐	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
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	☐	☐	☒	☐
iv. Impede or redirect flood flows?	☐	☐	☐	☒
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

3.10.1 Impact Analysis

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

The proposed project would include asphalt pavement which would create additional impervious surfaces on the project site and increase the potential of surface runoff. Increased siltation and sedimentation could result from erosion and storm runoff during project construction. However, as stated in Section 3.7, the City's General Plan Policy P5-1 and County General Plan Policy PFS-3.2 r effective storm drainage facilities for future development. Before ground disturbing construction activities, the City would be responsible for developing and implementing BMPs that would be used to reduce or eliminate pollutants in stormwater discharges from the project site which may include the following: use of wattles, silt fencing, and stabilization of construction entrances to minimize trackout. These BMPs would protect water quality. The impact is ***less than significant***, and this topic will not be discussed in the EIR.

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The proposed project is the construction and operation of a new well to supply water for the City. The City's groundwater supply is currently in overdraft. Operation of the well would contribute to overdraft conditions. The General Plan includes goals, policies, and implementing actions to develop conservation and recharge efforts to stabilize the region's aquifer (see the Public Services and Facilities, Open Space, Conservation, and Recreation, and Sustainable Development Elements of the General Plan).[30] As described in PRC Section 21083.3 and CEQA Guidelines Section 15183, projects that are consistent with the development density established by a general plan for which an EIR was certified shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects that are peculiar to the project site or its site. The Merced City Council adopted a Statement of Overriding Considerations for these impacts to groundwater in association with the Merced Vision 2030 General Plan Final Program EIR (City Council Resolution #2011-63). This impact is not unique to the proposed project, and is therefore exempt from further review for impacts on groundwater supply.

Well 22 would be located near an existing domestic water well located southeast of the project site. The existing well is currently documented in a 1977 Merced County Department of Health Water Well Inspection Data Report to have a perforated depth from 120 to 140 feet below grade, which indicates the existing well draws from a separate shallower aquifer that is above the deeper aquifer Well 22 will draw from. To address this potential impact, the City proposes to locate Well 22 0.25 mile away from the existing domestic water well. Also, as noted in Section 1.3.3 of the Project Description, the City will also develop a test well next to the production well and perform pump testing to determine an acceptable pumping capacity and pump depth that will prevent impacting groundwater supplies from existing wells. Potential adverse effects to the existing domestic water well are considered ***potentially significant***, and will be evaluated in the EIR.

c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site;

The proposed project would not alter the drainage pattern of the site or alter the course of a stream or river in a manner that would result in substantial erosion or siltation on- or off-site. There is no river or stream on-site. This impact would be ***less than significant***, and this topic will not be discussed in the EIR.

[30] Merced, City of, 2012. Merced Vision 2030 General Plan. January 3.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

There are no streams or rivers in the proposed project area. Stormwater runoff from the project would be diverted to the proposed storm water basin located within the project site, as shown in Figure 3, Conceptual Site Plan. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

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

As stated above in response to 3.10.1.a, before ground-disturbing construction activities, the City will implement BMPs "to reduce potential impacts to water quality during construction in accordance with the guidelines of the City of Merced Storm Water Management Program." BMPs will reduce or eliminate pollutants in stormwater discharges from the project site which may include the following: use of wattles, silt fencing, and stabilization of construction entrances to minimize trackout. This BMP would protect water quality. The impact would be ***less than significant***, and this topic will not be discussed in the EIR.

iv. Impede or redirect flood flows?

Refer to Section 3.10.1.c.ii and 3.10.1.c.iii. The proposed project would not alter the drainage pattern of the site or alter the course of a stream or river. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

The project site is not located in a flood hazard, tsunami, or seiche hazard zone.[31] Besides flood hazards associated with 100-year flood zones, another potential hazard for Merced is flood inundation caused by levee or dam failure resulting from a variety of factors. However, the project site is not located within a dam inundation hazard zone.[32] Therefore, ***no impact*** would occur, and this topic will not be discussed in the EIR.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Refer to Section 3.10.1.b. The City's groundwater supply is currently in overdraft. Operation of the well would contribute to overdraft conditions. The Merced City Council adopted a Statement of Overriding Considerations for these impacts to groundwater in association with the Merced Vision 2030 General Plan Final Program EIR (City Council Resolution #2011-63). This impact is not peculiar

[31] Federal Emergency Management Agency, 2008. FEMA Flood Map Service Center. Website: https://msc.fema.gov/portal/search#searchresultsanchor (accessed September 2019).

[32] Merced, City of, 2012. *Merced Vision 2030 General Plan.* January 3.

to the proposed project, and is therefore exempt from further review for impacts on groundwater supply. ***No new impact*** would occur, and this topic will not be discussed in the EIR.

3.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.11.1 Impact Analysis

a. Would the project physically divide an established community?

The physically division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas. For instance, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside of the community.

The proposed project would include the construction of Well 22 and a water storage tank. The proposed project would not affect connectivity, and would not divide an established community. Therefore, the proposed project would have ***no impact*** related to these issues. This topic will not be discussed in the EIR.

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

The project site is designated Agricultural Residential (AR) in the County of Merced 2030 General Plan. This land use designation is intended to provide for single-family dwellings on lots in a semi-rural environment with limited public services. The project site is located within the AR zoning district. The AR district is intended to provide for areas for rural residential development and hobby farming and limited animal raising operations with less than a full range of urban services. The proposed project would not require a change to the General Plan land use designation or the current zoning and would be consistent with the City's General Plan and Zoning Ordinance. Additionally, the proposed project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect and therefore would result in ***no impact***. This topic will not be discussed in the EIR.

3.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.12.1 Impact Analysis

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

There are no known mineral resources within or in the vicinity of the project site. The City's Open Space, Conservation, and Recreation chapter of the City's General Plan states that, according to the State Mining and Geology Board, the City's SOI does not contain any mineral resources that require managed production.[33] In addition, there are no Mineral Resource Zones (MRZ), areas designated as processing minerals which are of State-wide or regional significance, within the City of Merced's SOI or in the area designated for future expansion of the City. As a result, the proposed project would not result in the loss of availability of a known mineral resources of value to the region or residents of the State. Therefore, the proposed project would have ***no impact***, and this topic will not be discussed in the EIR.

b. Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Please refer to Section 3.12.1.a. The proposed project would not result in the loss of availability of any known locally-important mineral resource recovery sites. Therefore, the proposed project would have ***no impact***, and this topic will not be discussed in the EIR.

[33] Merced, City of, 2012. *Merced Vision 2030 General Plan.* January 3.

3.13 NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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 2 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?	☐	☐	☐	☒

3.13.1 Impact Analysis

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness; and similarly, each 10 dB decrease in sound level is perceived as half as loud. Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted sound level is the basis for 24-hour sound measurements that better represent human sensitivity to sound at night.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq}, the community noise equivalent level (CNEL), and the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly

L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

The County of Merced addresses noise in the Health and Safety Element of the General Plan and in the County Code. The Noise Element of the General Plan provides goals and policies that work to protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise. Policy HS-7.12 requires new projects to include appropriate noise mitigation measures to reduce noise levels in compliance with the standards shown in Table 3.E within sensitive areas. If a project includes the creation of new non-transportation noise sources, require the noise generation of those sources to be mitigated so they do not exceed the interior and exterior noise level standards of Table 3.E at existing noise-sensitive areas in the project vicinity.

The County Code addresses construction activity noise and states that construction activities are exempt from the County's noise standards provided that activities occur between the hours of 7:00 a.m. to 6:00 p.m. and that all construction equipment shall be properly muffled and maintained.

Major sources of noise in the County of Merced include cars and trucks, trains, and aircraft. Other sources of noise include home appliances, tools, and construction equipment. The predominant sources of noise at the project site include agriculture and low-density neighborhood, consisting of noise from existing nearby residences and traffic along East Cardella Road and Hatch Road.

Certain land uses are considered more sensitive to noise than others. Examples of these land uses include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. As noted in the Project Description, the project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to three acres in size. Single-family homes are located directly south and northeast of the proposed well site. The adjacent residential uses rely on residential groundwater wells and septic tanks. Land to the west of the proposed well site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use. The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road.

Table 3.E: Non-Transportation Noise Standards

Median (L_{50})/Maximum (L_{max})[1]				
Receiving Land use	Outdoor Area[2]		Interior[3]	Notes
	Daytime	Nighttime	Day or Night	
All Residential	55/75	50/70	35/55	
Transient Lodging	55/75	-	35/55	4
Hospitals & Nursing Homes	55/75	-	35/55	5,6
Theaters & Auditoriums	-	-	30/50	6
Churches, Meeting Halls, Schools, Libraries, etc.	55/75	-	35/60	6
Office Buildings	60/75	-	45/65	6
Commercial Buildings	55/75	-	45/65	6
Playgrounds, Parks, etc.	65/75	-	-	6
Industry	60/80	-	50/70	6

Source: County of Merced (2013).
Notes:
[1] These standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards in this table, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.
[2] Sensitive Outdoor Areas include primary outdoor activity areas associated with any given land use at which noise-sensitivity exists and the location at which the County's exterior noise level standards are applied.
[3] Sensitive Interior Areas includes any interior area associated with any given land use at which noise-sensitivity exists and the location at which the County's interior noise level standards are applied. Examples of sensitive interior spaces include, but are not limited to, all habitable rooms of residential and transient lodging facilities, hospital rooms, classrooms, library interiors, offices, worship spaces, theaters. Interior noise level standards are applied within noise-sensitive areas of the various land uses with windows and doors in the closed positions.
[4] Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.
[5] Since hospitals are often noise-generating uses, the exterior noise level standards are applicable only to clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
[6] The outdoor activity areas of these uses (if any) are not typically used during nighttime hours.
[7] Where median (L_{50}) noise level data is not available for a particular noise source, average (L_{eq}) values may be substituted for the standards of this table provided the noise source operates for at least 30 minutes. If the source operates less than 30 minutes the maximum noise level standards shown shall apply.

The following section discusses the potential noise and vibration impacts associated with implementation of the proposed project.

Short-Term (Construction) Noise Impacts. Project construction would result in short-term noise impacts on the nearby sensitive receptors. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The level and types of noise impacts that would occur during construction are described below.

Short-term noise impacts would occur during grading and site preparation activities. Table 3.F lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and materials to the site, which would incrementally increase noise levels on roads leading to the site. As shown in Table 3.F, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during grading and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table 3.F: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Maximum Noise Level (L_{max}) at 50 Feet[1]
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95
Jackhammers	20	85
Pick-up Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rock Drills	20	85
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Welder	40	73

Source: Roadway Construction Noise Model (FHWA 2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.
[1] Maximum noise levels were developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.
L_{max} = maximum instantaneous sound level

Table 3.F lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 87 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, including excavation and grading of the site, tends

to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Specific construction details (e.g., construction fleet activities) are not yet known, therefore, this analysis assumes a crane, forklift, tractor, welder, and compressor would be operating simultaneously during construction of the proposed project. Based on the typical construction equipment noise levels shown in Table 3.F, noise levels associated with a crane, forklift, tractor, welder, and compressor operating simultaneously would be approximately 87 dBA L_{max} at 50 feet.

The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. Therefore, the closest sensitive receptor may be subject to short-term maximum construction noise reaching 87 dBA L_{max} during construction. However, construction equipment would operate at various locations within the project site and would only generate this maximum noise level when operations occur closest to the receptor.

However, construction noise would be intermittent and sporadic as construction phasing occurs. Noise levels would attenuate at sensitive receptors as construction activity moves further into the site. Construction noise is permitted by the County when activities occur between the hours of 7:00 a.m. to 6:00 p.m. and all construction equipment is properly muffled and maintained.

As discussed in the Project Description, all work would be performed between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day. Based on the construction equipment noise levels identified in Table 6, well drilling tasks would generate noise levels of approximately 85 dBA L_{max}. As identified above, the closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the well would be located within the pump station, which would be located approximately 330 feet from the residence. Based on a reduction in noise of 6 dBA per doubling of distance, there would be a decrease of approximately 16 dBA from the pump station area to the nearest residence. Therefore, the closest sensitive receptor would be subject to noise levels of approximately 69.0 dBA L_{max} from well drilling tasks. These construction activities would occur outside the County's permitted hours; however during Phase 1, the well drilling activities would occur around the clock for a limited period of approximately 6 to 10 calendar days out of the 90 total work days. Additionally, during Phase 2, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

As discussed above, construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Implementation of Mitigation Measure NOI-1 for project construction would reduce potential construction period noise impacts for the indicated sensitive receptors to a ***less-than-significant level with mitigation***. This topic will not be discussed in the EIR.

Mitigation Measure NOI-1 The project contractor shall implement the following measures during construction of the project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.
- Prohibit extended idling time of internal combustion engines.
- Designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

Operational Noise Impacts. Operation of the proposed project would result in the generation of noise levels above existing conditions. The project would include the construction a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. Associated infrastructure that would be constructed as part of the project would include an approximately 10,000 square-foot CMU block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, booster pump station piping. The building would also include electrical, a SCADA computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the project site. The project would also include construction of a fuel tank, transformer and pad, and drain box.

The components of the proposed project that would generate the most noise would be the booster pumps used for boosting pressure. Based on reference noise measurements previously conducted by LSA, mechanical equipment-related noise, including the generator, would generate noise levels of approximately 75 dBA L_{max} at 3 feet, while each booster pump is conservatively estimated to generate 65 dBA L_{max} at 20 feet from the pump. This analysis assumes that pumps and equipment associated with the proposed project would operate 24 hours a day 7 days a week.

As identified above, the closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the pump station would be located approximately 330 feet from the residence. Based on a reduction in noise of 6 dBA per doubling of distance, there would be a decrease of approximately 24 dBA from the pump station area to the nearest residence. Therefore, the closest sensitive receptor would be subject to noise levels of approximately 38.0 dBA L_{max} from booster pump operations. As shown in Table 3.E above, the County sets exterior noise level standards at 55 dBA L_{eq} and 75 dBA L_{max} at receiving residential land uses. Therefore, the maximum noise levels associated with operation of the pump station would not exceed the County's standard of 75 dBA L_{max}. In addition, as identified above, this analysis assumes that the proposed project would operate up to 24 hours a day 7 days a week. When averaged over a 24-hour period, this noise level would also not exceed the County's noise level standards of 55 dBA L_{eq} for residential land uses. Based on standard exterior to interior noise attenuation rates, with windows closed the interior noise level of 35 dBA L_{eq} and 55 dBA L_{max} for residential land uses would be met. In addition, a CMU wall would be constructed around the pump station, which would screen the residence and reduce noise levels. Therefore, the proposed project would not expose persons to noise levels in excess of noise standards and noise impacts would be ***less than significant***. This topic will not be discussed in the EIR.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Vibration energy propagates from a source, through intervening soil and rock layers, to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as the motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are construction activities (e.g., pavement breaking and operating heavy-duty earthmoving equipment), and occasional traffic on rough roads. In general, groundborne vibration from standard construction practices is only a potential issue when within 25 feet of sensitive uses. Groundborne vibration levels from construction activities very rarely reach levels that can damage structures; however, these levels are perceptible near the active construction site. With the exception of old buildings built prior to the 1950s or buildings of historic significance, potential structural damage from heavy construction activities rarely occurs. When roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible.

The streets surrounding the project area are paved, smooth, and unlikely to cause significant groundborne vibration. In addition, the rubber tires and suspension systems of fire engines and other on-road vehicles make it unusual for on-road vehicles to cause groundborne noise or vibration problems. It is, therefore, assumed that no such vehicular vibration impacts would occur and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once

constructed, the proposed project would not contain uses that would generate groundborne vibration.

Construction Vibration. Construction of the proposed project could result in the generation of groundborne vibration. This construction vibration impact analysis discusses the level of human annoyance using vibration levels in vibration velocity decibels (VdB) and will assess the potential for building damages using vibration levels in peak particle velocity (PPV, inches per second) because vibration levels calculated in root-mean-square (RMS) are best for characterizing human response to building vibration, while vibration level in PPV is best used to characterize potential for damage. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guidelines indicate that a vibration level up to 102 VdB (an equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table 3.G shows the PPV and VdB values at 25 feet from a construction vibration source. As shown in Table 3.G, bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of groundborne vibration when measured at 25 feet, based on the Transit Noise and Vibration Impact Assessment. At this level, groundborne vibration would result in potential annoyance to residents and workers, but would not cause any damage to the buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/office buildings in the project vicinity). Outdoor site preparation for the proposed project is expected to include the use of bulldozers and loaded trucks. The greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels.

Table 3.G: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 feet	
	PPV (in/sec)	L_V (VdB)[a]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Sources: *Transit Noise and Vibration Impact Assessment* (FTA 2018).
[a] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
µin/sec = micro-inches per second
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below.

$$L_vdB\ (D) = L_vdB\ (25\ ft) - 30\ Log\ (D/25)$$
$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the closest structure to the project site boundary includes the detached garage associated with the residence, located approximately 25 feet from the project site boundary. At 25 feet, the vibration level at the nearest building from construction equipment would not exceed the FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. Although construction vibration levels at nearby buildings would have the potential to result in annoyance, these vibration levels would no longer occur once construction of the project is complete. Therefore, groundborne vibration impacts from construction activities associated with the proposed project would be ***less than significant***. This topic will not be discussed in the EIR.

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 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is not located within two miles of a public or public use airport. The nearest airports to the project site include Merced Regional Airport, located approximately 5.5 miles southwest of the project site, and Castle Airport, located approximately 6.2 miles northwest of the project site. Aircraft noise is occasionally audible at the project site; however, no portion of the project site lies within the 55 dBA CNEL noise contours of any public airport nor does any portion of the project site lie within two miles of any private airfield or heliport. Therefore, the proposed project would not result in the exposure of people residing or working in the project area to excessive noise levels and ***no impact*** would occur. This topic will not be discussed in the EIR.

3.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14.1 Impact Analysis

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

The proposed project would include the construction of Well 22 and a water storage tank. The proposed project would not result in direct population growth as the use proposed is not residential and would not contribute to permanent residency on the site. In addition, the proposed Well 22 would replace an existing well, and therefore would not induce substantial indirect population growth by increasing the availability of water supplies. Therefore, the proposed project would not directly or indirectly induce population growth and there would be ***no impact.*** This topic will not be discussed in the EIR.

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project site is currently vacant and does not include housing. Therefore, the proposed project would not displace existing housing or require the construction of replacement housing and would result in ***no impact.*** This topic will not be discussed in the EIR.

3.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?	☐	☐	☐	☒
ii. Police protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

3.15.1 Impact Analysis

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:

i. Fire protection?

The proposed project would involve the construction of a municipal water well. The General Plan includes policies and implementation actions that require all new development to financially contribute to any needed fire protection services. Implementation of the proposed project would not in itself result in a need for fire protection services. Therefore, no new fire protection facilities would be required with implementation of the project, and ***no impact*** would occur. This topic will not be discussed in the EIR.

ii. Police protection?

Implementation of the proposed project would not affect police protection services, nor would any related facilities require construction. As noted in Section 3.14, Population and Housing, the proposed project would not result in direct or indirect population growth. Therefore, ***no impact*** would occur, and this topic will not be discussed in the EIR.

iii. Schools?

As noted in Section 3.14, Population and Housing, the proposed project would not result in direct or indirect population growth, and therefore would not generate student demand or otherwise impact school services. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

v. Parks?

As noted in Section 3.14, Population and Housing, the proposed project would not result in direct or indirect population growth, and would not generate a need for additional park space. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

v. Other public facilities?

Development of the proposed project would not increase demand for other public services including libraries, community centers, and public health care facilities. As previously discussed, the proposed project would not result in direct or indirect population growth and would therefore not result in increased demand for other public facilities. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

3.16 RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.16.1 Impact Analysis

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?

The proposed project consists of construction of a municipal water well that would provide water for the city. Implementation of the proposed project would not contribute to physical deterioration of existing recreational facilities, and ***no impact*** would occur. This topic will not be discussed in the EIR.

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?

Refer to Section 3.16.1.a. The proposed project would not require the construction or expansion of recreational facilities, and would not have an adverse effect on the environment. As such, ***no impact*** would occur, and this topic will not be discussed in the EIR.

3.17 TRANSPORTATION

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

3.17.1 Impact Analysis

a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Implementation of the proposed project would involve the transportation of construction equipment, materials, and workers commuting to the site, which would generate a small temporary increase in overall daily traffic volumes. However, the increase would not be substantial and would not increase congestion during the operational period. As such, ***no impact*** would occur, and this topic will not be discussed in the EIR.

b. Would the project conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?

Effective December 28, 2018, the CEQA Guidelines were updated to require the evaluation of vehicle miles travelled (VMT) as the criteria for analyzing transportation impacts for land use projects. As noted in CEQA Guidelines Section 15064.3(c), the provisions of CEQA Guidelines Section 15064.3 shall apply prospectively as described in CEQA Guidelines Section 15007. A lead agency may elect to be governed by the provisions of CEQA Guidelines Section 15064.3 immediately; however, beginning on July 1, 2020, the provisions of this section shall apply statewide. The City of Merced, as lead agency, has not yet elected to be governed by the provisions of CEQA Guidelines Section 15034.3. Therefore, the proposed project would neither conflict nor be inconsistent with CEQA Guidelines Section 15064.3, and there would be ***no impact***. This topic will not be discussed in the EIR.

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

Access to the project site would be from Hatch Road and East Cardella Road. Implementation of the proposed project would not involve roadway design features or incompatible vehicle uses, and therefore, there would be ***no impact***. This topic will not be discussed in the EIR.

d. Would the project result in inadequate emergency access?

As noted above, access to the project site would be from Hatch Road and East Cardella Road. The proposed project would not involve and alteration to roadway design features and would be required to comply with General Plan's Circulation Plan and policies that promote emergency vehicle access to all portions of the City and planning area. As such, there would be ***no impact***, and this topic will not be discussed in the EIR.

3.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
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)? Or	☐	☐	☐	☒
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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

3.18.1 Impact Analysis

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)? Or

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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

As stated in Section 3.5, Cultural Resources, areas of the project site subject to construction activities are likely to have been subject to ground disturbance in the past. No tribal resources are known to occur or have been identified at the project site or in the vicinity of the project site. However, as noted in Section 3.5, Cultural Resources, implementation of Mitigation Measures CUL-1 and CUL-2 would protect previously unrecorded or unknown cultural resources, including Native American artifacts and human remains, should these be encountered during project construction.

In addition, Assembly Bill (AB) 52 provides for consultation between lead agencies and Native American tribal organizations during the CEQA process. Since AB 52 was enacted in July 2015, the City has not been contacted by any California Native American tribes requesting that they be notified when projects are proposed in Merced.[34] As a result, the City is not required to notify any tribes of this project, and no tribes have requested consultation pursuant to Public Resources Code section 21080.3.1. Therefore, it is assumed that no Tribal Cultural Resources would be adversely affected by the project. As a result, ***no impact*** would occur, and this topic will not be discussed in the EIR.

3.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
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 project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
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?	☐	☐	☒	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19.1 Impact Analysis

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

[34] Espinosa, Kim. 2019. Merced. Merced Planning Manager, City of Merced. Personal communication with LSA. November.

The proposed project includes construction and operation of a new domestic water supply well to replace a well that has been taken out of service. The project itself would not require the relocation or construction of new or expanded facilities that would result in a significant environmental effect. Therefore, this impact would be ***less than significant***, and this topic will not be discussed in the EIR.

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Construction and operation of the proposed Well 22 would be consistent with the improvements identified in the City of Merced 2016 Water Master Plan Update (2016 WMP)[35] and analyzed in the 2017 Initial Study and Mitigated Negative Declaration.[36] As a result, sufficient water supplies would be available for extraction by the proposed project. Therefore, this impact would be ***less than significant***, and this topic will not be discussed in the EIR.

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The proposed project would include the construction of a municipal water well as described in Section 1.0, Project Description, of this Initial Study. No expansion of existing or construction of new wastewater facilities would be required, as no wastewater would be generated. Therefore, wastewater treatments would not be exceeded, and ***no impact*** would occur. This topic will not be discussed in the EIR.

d. Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Operation of the proposed project would not be expected to generate substantial solid waste. Any solid waste generated during construction activities related to the proposed project would be disposed at the Highway 59 Landfill, which is currently permitted to operate through December 2029.[37] Therefore, this impact would be ***less than significant***, and this topic will not be discussed in the EIR.

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

As noted above, any solid waste generated by the proposed project would be disposed at the Highway 59 Landfill. Transportation and disposal would be conducted in accordance with all

35 Merced, City of, 2017. 2016 Water Master Plan Update. January.

36 Merced, City of, 2017. Mitigated Negative Declaration and Initial Study for City of Merced 2016 Water Master Plan Update. January.

37 California Department of Resources Recycling and Recovery, 2019. SWIS Facility Detail. Highway 59 Landfill (24-AA-0001). Website: https://www2.calrecycle.ca.gov/swfacilities/Directory/24-AA-0001/ (accessed September 2019).

applicable federal, state, and local statutes and regulations. As such, ***no impact*** would occur, and this topic will not be discussed in the EIR.

3.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
b. 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?	☐	☐	☒	☐
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?	☐	☐	☒	☐
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?	☐	☐	☒	☐

3.20.1 Impact Analysis

a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

The project site is not located within any state responsibility areas (SRA) for fire service,[38] and is not within a very high fire hazard severity zone.[39] In addition, as noted in Section 3.9.f, the proposed project would not impair the implementation of, or physically interfere with, and adopted emergency response plan. Therefore, this impact would be ***less than significant***, and this topic will not be discussed in the EIR.

b. Would the project, 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?

Refer to Section 3.20.1.a. Additionally, as noted in Section 1.0, Project Description, the project site is generally level. Therefore, the proposed project would not exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, and this impact would be ***less than significant***. This topic will not be discussed in the EIR.

[38] California Board of Forestry and Fire Protection, 2019. State Responsibility Area Viewer. Website: https://bof.fire.ca.gov/projects-and-programs/state-responsibility-area-viewer/ (accessed September 2019).

[39] California Department of Forestry and Fire Protection, 2007. *Draft Fire Hazard Severity Zones In LRA, Merced County*. September 21.

c. Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Refer to Section 3.20.1.a. The proposed project is not located within an SRA for fire service and is not within a very high fire hazard severity zone. Therefore, the proposed project would not require the installation or maintenance of associated infrastructure, and this impact would be ***less than significant***. This topic will not be discussed in the EIR.

d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Refer to Section 3.20.1.a and 3.20.1.b. The project site is generally level and is not located within an SRA for fire service or a very high fire hazard severity zone. Therefore, the proposed project would not expose people or structures to significant risks as a result of post-fire slope instability or drainage and runoff changes, and this impact would be ***less than significant***. This topic will not be discussed in the EIR.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☒	☐	☐
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.)	☒	☐	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

3.21.1 Impact Analysis

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?

Implementation of Mitigation Measures BIO-1 would ensure that potential impacts to nesting birds would be reduced to less-than-significant levels. Implementation of Mitigation Measures CUL-1 and CUL-2 would ensure that potential impacts to cultural resources that could be uncovered during construction activities would be reduced to a less-than-significant level. Therefore, with the incorporation of mitigation measures, development of the proposed project would not: 1) degrade the quality of the environment; 2) substantially reduce the habitat of a fish or wildlife species; 3) cause a fish or wildlife species population to drop below self-sustaining levels; 4) threaten to eliminate a plant or animal community; 5) reduce the number or restrict the range of a rare or endangered plant or animal; or 6) eliminate important examples of the major periods of California history. Therefore, this impact would be ***less than significant with mitigation incorporated***. This topic will not be discussed in the EIR.

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)?

The proposed project's impacts would be individually limited and not cumulatively considerable due to the site-specific nature of the potential impacts. The potentially significant impacts that can be reduced to a less-than-significant level with implementation of recommended mitigation measures including the topics of air quality, biological resources, cultural resources, geology and soils, and noise. These impacts would primarily be related to construction-period activities, would be temporary in nature, and would not substantially contribute to any potential cumulative impacts associated with these topics.

For the topic of air quality, potentially significant impacts to air quality standards associated with project construction would be reduced to less-than-significant levels with implementation of Mitigation Measure AIR-1. For the topic of biological resources, implementation of Mitigation Measures BIO-1 would ensure that impacts to nesting bird species would be reduced to a less-than-significant level.

For the topic of cultural resources, potentially significant impacts to archaeological resources would be reduced to less-than-significant levels with implementation of Mitigation Measures CUL-1 and CUL-2.

For the topic of geology and soils, potentially significant impacts to paleontological resources would be reduced to less-than-significant levels with implementation of Mitigation Measure GEO-1.

For the topic of noise, implementation of Mitigation Measure NOI-1 would reduce potential construction period noise impacts for sensitive receptors to less-than-significant levels.

For the topics of aesthetics, agriculture and forestry resources, energy, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral

resources, population and housing, public services, recreation, tribal cultural resources, transportation, utilities and service systems, and wildfire, the project would have no impacts or less-than-significant impacts, and therefore, the project would not substantially contribute to any potential cumulative impacts for these topics. All environmental impacts that could occur as a result of the proposed project would be reduced to a less-than-significant level through the implementation of the mitigation measures recommended in this document.

Implementation of these measures would ensure that the impacts of the project would be below established thresholds of significance and that these impacts would not combine with the impacts of other cumulative projects to result in a cumulatively considerable impact on the environment as a result of project development.

However, as discussed in this Initial Study, a ***potentially significant impact*** related to groundwater supply may result from the proposed project. This impact, as well as any cumulatively considerable impacts that may result from the proposed project related to this issue, will be evaluated in the EIR.

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

The proposed project's potential to result in environmental effects that could directly or indirectly impacts human beings have been evaluated in this Initial Study. With implementation of the recommended mitigation measures, environmental effects that could adversely affect human beings would be ***less than significant with mitigation incorporated***. This topic will not be discussed in the EIR.

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4.0 LIST OF PREPARERS

LSA
7086 North Maple Avenue, Suite 104
Fresno, California 93720
Amy Fischer, Principal-in-Charge
Kyle Simpson, Associate/Project Manager
Cara Carlucci, Planner

157 Park Place
Pt. Richmond, California 94801
Andy, Pulcheon, Cultural Resources, Principal
Matthew Wiswell, Planner
Mirana Rideout, GIS Specialist
Patty Linder, Graphics/Document Production
Charis Hanshaw, Document Management

201 Creekside Ridge Court, Suite 250
Roseville, California 95678
Katie Vallaire, Senior Cultural Resources Manager
Mariko Falke, Cultural Resources Analyst
Kristin Nurmela, Associate/Environmental Planner
Anna Van Zuuk, Biologist/Botanist

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APPENDIX A

AIR QUALITY AND GREENHOUSE GAS ANALYSIS

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CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: December 2, 2019

TO: Joseph D. Angulo, P.G., Environmental Project Manager

FROM: Amy Fischer, Principal
Cara Carlucci, Planner

SUBJECT: Air Quality and Greenhouse Gas Analysis for the proposed Municipal Well Site #22

This Air Quality and Greenhouse Gas Analysis for the proposed Municipal Well Site #22 Project (project) in the County of Merced (County) has been prepared using methods and assumptions recommended in the San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI).[1] This analysis includes a description of existing regulatory framework, an assessment of project construction and operation-period emissions, and an assessment of greenhouse gas (GHG) emissions. Measures to reduce or eliminate significant impacts are identified, where appropriate.

The project site is located at 3987 Hatch Road in Merced County, on the southwest corner of the intersection of East Cardella Road and Hatch Road. The proposed well would be located on Assessor's Parcel Number (APN) 060-560-002. Figure 1 shows the project site's regional and local context. The project site is located on a rectangular parcel that is 4.01 acres in size. The proposed well site is currently vacant and undeveloped, with ruderal vegetation located throughout.

The project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to 3 acres in size. Figure 2 depicts an aerial photograph of the project site and identifies surrounding land uses. As shown in Figure 2, single-family homes are located directly south and northeast of the proposed well site. Land to the west of the project site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use.

The project includes the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the California State Water Resources Control

[1] San Joaquin Valley Air Pollution Control District, 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19. Website: www.valleyair.org/transportation/ceqa_idx.htm (accessed October 2019).

Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Plan and the recommendations contained in technical reports by the City's engineering consultant. The project would maintain the surety of the City's water supply in the event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

Municipal Well Site 22

The project site is located at 3987 Hatch Road in Merced County, on the southwest corner of the intersection of East Cardella Road and Hatch Road. The proposed well would be located on Assessor's Parcel Number (APN) 060-560-002. Figure 1 shows the project site's regional and local context. The project site is located on a rectangular parcel that is 4.01 acres in size. The proposed well site is currently vacant and undeveloped, with ruderal vegetation located throughout.

The project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to 3 acres in size. Figure 2 depicts an aerial photograph of the project site and identifies surrounding land uses. As shown in Figure 2, single-family homes are located directly south and northeast of the proposed well site. Land to the west of the project site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use.

The project includes the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the California State Water Resources Control Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Plan and the recommendations contained in technical reports by the City's engineering consultant. The project would maintain the surety of the City's water supply in the event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

Municipal Well Site 22

The proposed well site is located within a 4.01-acre parcel, approximately 1.09 acres of which is dedicated as ROW for the future extension of East Cardella Road. Well 22, the water storage tank, and associated infrastructure would be located within the parcel in an area approximately 1.84 acres in size that would be set back from Hatch Road by approximately 185 feet.

Although the City has not prepared final design plans for the project, Well 22 would be approximately 600 feet deep and designed to yield 2,500 gallons per minute.

Associated infrastructure that would be constructed as part of the project would include an approximately 10,000 square-foot concrete masonry unit (CMU) block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, booster pump station piping. The building would also include electrical, a supervisory control and data acquisition (SCADA) computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the project site.

The project would also include construction of a fuel tank, transformer and pad, and drain box.

The project would include a three-million-gallon water storage tank, constructed of either welded steel or prestressed concrete, and a booster pump station. The proposed water storage tank would be approximately 35 feet tall, and a paved 20-foot-wide access area would border the circumference of the tank.

The booster pump station would have vertical turbine suction barrel pumps located inside a CMU block wall or pre-engineered metal building. Water from the pump station would discharge into an above-ground header pipe located within the building. From the header pipe, the piping would go below-grade and connect to the proposed distribution main in Hatch Road. Associated on-site infrastructure would include a drain line with a valve and blind flange.

Site improvements include construction of an 8-foot exterior block wall, access gates, security monitors, 20-foot LED lighting fixtures, a 50-foot antenna tower, vehicle parking, and frontage landscaping.

All unused portions of the 1.84-acre well site would be covered with asphalt. Access to the project site would be provided by a new 20-foot-wide driveway via the future extension of East Cardella Road.

Construction

The Well 22 Project would be constructed in three phases, as described below.

Phase 1

Phase 1 would include the completion of a temporary test well: preparation of the well site area and grading to create a temporary bermed area to contain and percolate well development water; well drilling, test pumping, and water sampling for laboratory analysis. Overall construction of the Well 22 facilities under Phase 1 would occur over approximately 90 work days. However, the well drilling activities would occur around the clock for a limited period of approximately six to ten calendar days out of the 90 total work days.

Phase 2

Phase 2 would include the completion of the new municipal well. Construction activities would initiated with installing and sealing a 34-inch conductor casing in a 48-inch diameter hole to an approximate depth of approximately 50 feet. This casing string would provide the primary sanitary protection of the well. The production borehole would be advanced though the conductor casing,

and would be drilled at a diameter of 28-inches to a depth of approximately 640 feet. A casing assembly, consisting of 18-inch blank well casing and well screen, would be installed in the production borehole. An annular seal of cement grout would be installed to a depth of 200 feet or more. A gravel envelope from the annular seal to the borehole depth of 640 feet would be installed around the well screen to retain the unconsolidated aquifer materials (sand and gravel) and allow sand-free production from the well. An engine-driven deep well turbine test pump would be installed for final well development and testing. As with Phase 1 above, well development water would be retained in a temporary bermed area. Overall construction of the Well 22 facilities under Phase 2 would occur over approximately 120 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

Phase 3

Phase 3 would include the completion of the new pump station including: installation of a new concrete masonry pump building, asphalt concrete paving, storm water basin, submersible well pump, station piping, water storage tank, backup diesel generator, fuel tank, system controls, electrical transformer, motor control panel, concrete masonry walls, security gates, yard lighting, and landscaping.

The construction of Phase 3 would take approximately 18 months.

The total time for completing all phases is estimated at 36 months, when allowing for the interim design period as well as contract bidding and start up for each construction phase. All work would be performed between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day, as noted above.

Construction of the project is anticipated to start in April 2021 and end in April 2024.

ENVIRONMENTAL SETTING

Air Quality Background

Air quality is primarily a function of both local climate, local sources of air pollution and regional pollution transport. The amount of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and for photochemical pollutants, sunshine.

A region's topographic features have a direct correlation with air pollution flow and, therefore, are used to determine the boundary of air basins. The proposed project is located in the County of Merced, within the jurisdiction of the SJVAPCD, which regulates air quality in the San Joaquin Valley Air Basin (SJVAB).

The SJVAB is comprised of approximately 25,000 square miles and covers all of seven counties including Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the western

portion of an eighth, Kern. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is topographically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. An aerial view of the SJVAB would simulate a "bowl" opening only to the north. These topographic features restrict air movement through and out of the basin.

Both the State of California (State) and the federal government have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants: carbon monoxide (CO), Ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter ($PM_{2.5}$ and PM_{10}). The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the USEPA to identify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the applicable National Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The SJVAB attainment statuses for each of the criteria pollutants are listed in Table 1**.**

Table 1: SJVAB Air Quality Attainment Status

Pollutant	State	Federal
Ozone (1-hour)	Severe/Nonattainment	Standard Revoked
Ozone (8-hour)	Nonattainment	Extreme Nonattainment
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Attainment (Maintenance)
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Lead	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Regulation
Hydrogen Sulfide	Unclassified	No Federal Regulation

Source: California Air Resources Board and USEPA, 2016.

Ozone levels, as measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the SJVAPCD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health; however the SJVAB still exceeds the State standard for 1-hour and 8-hour ozone levels. In addition, the SJVAB was designated as a serious nonattainment area for the federal 1997 8-hour ozone level in June 2004. The USEPA lowered the national 8-hour ozone standard from

0.80 to 0.75 parts per million (ppm) on May 27, 2008. The Valley is classified nonattainment for the 1-hour and 8-hour ozone standards at the State and federal level, although a request for redesignation as attainment of the 1-hour ozone standard was submitted to the USEPA in 2014.

The air quality monitoring station closest to the site is the 2334 M Street, Merced which monitors criteria air pollutant data. The air quality trends from this station are used to represent the ambient air quality in the project area. Air quality trends for O_3 and NO_2 are not available at the 2334 M Street monitoring station, and were obtained from the 385 S. Coffee Avenue, Merced monitoring station. During the 2016-2018 time period, the 385 S. Coffee Avenue air monitoring station recorded the following exceedances of the State and federal 1-hour and 8-hour ozone standards.[2]

- 28 exceedances of the federal 8-hour ozone standard in 2016, 16 in 2017, and 21 in 2018;
- 29 exceedances of the State 8-hour ozone standard in 2016, 17 in 2017, and 23 in 2018; and
- 2 exceedances of the State 1-hour ozone standard in 2016 and 4 in 2018.

National and State standards have also been established for particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) over 24-hour and yearly averaging periods. $PM_{2.5}$, because of the small size of individual particles, can be especially harmful to human health. $PM_{2.5}$ is emitted by common combustion sources such as cars, trucks, buses and power plants, in addition to ground-disturbing activities. The SJVAB is considered a nonattainment area for the $PM_{2.5}$ standard at the State and federal levels. The following $PM_{2.5}$ exceedances were recorded at the 2334 M Street air monitoring station:

- 2 exceedances of the federal 24-hour $PM_{2.5}$ standard in 2016, 6 in 2017, and 10 in 2018.

The SJVAB is classified as a PM_{10} nonattainment area at the State level and was redesignated from serious nonattainment to attainment of the federal PM_{10} standard in 2008. Because the SJVAB was redesignated from nonattainment to attainment, a PM_{10} maintenance plan was adopted in 2007 and is required to be updated every ten years. The following PM_{10} exceedances were recorded at the 2334 M Street air monitoring station:

- The State 24-hour PM_{10} standard was exceeded 6 times in 2016, 12 in 2017, and 10 in 2018.
- No exceedances of the federal 24-hour PM_{10} standard were measured at the 2334 M Street monitoring station during the 2016-2018 time period.

No exceedances of the State or federal carbon monoxide (CO) standards have been recorded at any of the region's monitoring stations since 1991. The SJVAB is currently considered an attainment area for State and federal 8-hour and 1-hour CO standards.

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[2] California Air Resources Board, 2019. iADAM Air Quality Data Statistics. Website: www.arb.ca.gov/adam (accessed October 2019).

Greenhouse Gas and Global Climate Change Background

Greenhouse gases (GHGs) are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur Hexafluoride (SF_6).

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, CH_4, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

Regulatory Framework

Air quality and GHG standards and the regulatory framework are discussed below.

Federal Regulations

At the federal level, the USEPA has been charged with implementing national air quality programs. USEPA air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change. This includes the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the Clean Air Act, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

California Air Resources Board

The CARB is the State's "clean air agency." The CARB's goals are to attain and maintain healthy air quality, protect the public from exposure to toxic air contaminants, and oversee compliance with air pollution rules and regulations. CARB is also the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Assembly Bill 2588 Air Toxics "Hot Spots" Information and Assessment Act. Under Assembly Bill (AB) 2588, stationary sources of air pollutants are required to report the types and quantities of certain substances their facilities routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, determine health risks, and notify nearby residents of significant risks.

The California Air Resources Board Handbook. The CARB has developed an Air Quality and Land Use Handbook[3] which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the CARB Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The CARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools, and playgrounds.

Land use designations with air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the CARB Handbook include taking steps to 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;

[3] CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); and
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The CARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site-specific meteorology, freeway truck percentages, or other factors that influence risk for a particular project site. The purpose of this guidance is to further examine project sites for actual health risk associated with the location of new sensitive land uses.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is Assembly Bill (AB) 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) CO_2e. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the CARB on December 11, 2008, and contains the main strategies California will implement to achieve the reduction of approximately 169 MMT of CO_2e, or approximately 30 percent, from the State's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent from 2002-2004 average emissions). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- The Low-Carbon Fuel Standard (15.0 MMT CO_2e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e).

The Scoping Plan identifies 18 emission reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional

transportation-related GHG targets, vehicle efficiency measures, goods movement, solar roof programs, industrial emissions, high speed rail, green building strategies, recycling, sustainable forests, water, and air. The measures would result in a total reduction of 174 MMT CO_2e by 2020.

On August 24, 2011, the CARB unanimously approved both the new supplemental assessment and reapproved its Scoping Plan, which provides the overall roadmap and rule measures to carry out AB 32. The CARB also approved a more robust CEQA equivalent document supporting the supplemental analysis of the cap-and-trade program. The cap-and-trade took effect on January 1, 2012, with an enforceable compliance obligation that began January 1, 2013.

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[4] to reflect the 2030 target set by Executive Order B-30-15 and codified by Senate Bill (SB) 32.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the CARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The CARB may update the targets every 4 years and must update them every 8 years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the CARB through Sustainable Community Strategies (SCS). The SCS are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that their SCS will not meet the GHG reduction target, they may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed Executive Order B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy

[4] California Air Resources Board. 2017. *California's 2017 Climate Change Scoping Plan*. November.

measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. Senate Bill 350 (SB 350), signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and
- Increasing energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the California Public Utilities Commission for the private utilities and by the California Energy Commission for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to State energy agencies under existing law. The addition made by this legislation requires State energy agencies to plan for, and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer 2016 the Legislature passed, and the Governor signed, SB 32 and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million CO_2e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

Senate Bill 100. On September 10, 2018, Governor Brown signed SB 100, which raises California's renewable portfolio standard requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. Executive Order B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." Executive Order B-55-18 directs CARB to work with relevant State agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon

neutrality goal. The goal of carbon neutrality by 2045 is in addition to other Statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

San Joaquin Valley Air Pollution Control District

The SJVAPCD has specific air quality-related planning documents, rules, and regulations. This section summarizes the local planning documents and regulations that may be applicable to the proposed project as administered by the SJVAPCD with CARB oversight.

Rule 2280—Portable Equipment Registration. Portable equipment used at project sites for less than six consecutive months must be registered with the SJVAPCD. The SJVAPCD will issue the registrations 30 days after receipt of the application.[5]

Rule 2303—Mobile Source Emission Reduction Credits. A project may qualify for SJVAPCD vehicle emission reduction credits if it meets the specific requirements of Rule 2303 for any of the following categories: [6]

- Low-Emission Transit Buses
- Zero-Emission Vehicles
- Retrofit Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles
- Retrofit Heavy-Duty Vehicles

Rule 4201 and Rule 4204—Particulate Matter Concentration and Emission Rates. Rule 4201 and Rule 4202 apply to operations that emit or may emit dust, fumes, or total suspended particulate matter.[7]

Rule 8011—General Requirements: Fugitive Dust Emission Sources. Fugitive dust regulations are applicable to outdoor fugitive dust sources. Operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII. According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources. For projects in which construction-related activities would disturb equal to or greater than 1 acre of surface area, the SJVAPCD recommends that demonstration of receipt of an SJVAPCD-approved Dust Control Plan or Construction Notification Form, before issuance of the first grading permit, be made a condition of approval.

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5 San Joaquin Valley Air Pollution Control District, Rule 2280 Portable Equipment Registration. Amended May 16, 1996.

6 San Joaquin Valley Air Pollution Control District, Rule 2280 Portable Equipment Registration. Amended May 16, 1996.

7 San Joaquin Valley Air Pollution Control District, 1992. Rule 4202 Particulate Matter – Emission Rate. Amended December 17, 1992.

Rule 9510—Indirect Source Review. In December 2005, the SJVAPCD adopted the Indirect Source Rule (Rule 9510) to meet its emission reduction commitments in the PM_{10} and O_3 Attainment Plans. Indirect Source Review regulation applies to any development project that includes at least 2,000 square feet of commercial space. This Rule requires project applicants to reduce operation emission of NO_x by 33.3 percent of the project's operational baseline and 50 percent of the project's operational PM_{10} emissions.

Guidance for Assessing and Mitigating Air Quality Impacts. The SJVAPCD prepared the GAMAQI to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB. The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process. The GAMAQI provides guidance on evaluating short-term (construction) and long-term (operational) air emissions. The most recent version of the GAMAQI, adopted March 19, 2015, was used in this evaluation. It contains guidance on the following:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- Methods to mitigate air quality impacts; and

Information for use in air quality assessments and environmental documents, including air quality, regulatory setting, climate, and topography data.

Climate Change Action Plan. In August 2008, the SJVAPCD adopted the Climate Change Action Plan (CCAP).[8] The CCAP directed the SJVAPCD to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG emissions on global climate change.

In December 2009, the SJVAPCD adopted the guidance: Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA[9] and the policy: District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.[10] The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS),[11] to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA. Projects implementing BPS in accordance with SJVAPCD's guidance would be determined to have a

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8 San Joaquin Valley Air Pollution Control District, 2008. Climate Change Action Plan. November.

9 San Joaquin Valley Air Pollution Control District, 2009. Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17.

10 San Joaquin Valley Air Pollution Control District, 2009. Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency. December 17.

11 San Joaquin Valley Air Pollution Control District, 2009. Final Staff Report Appendix J: GHG Emission Reduction Measures – Development Projects. December 17.

less than significant individual and cumulative impact on GHG emissions and would not require project specific quantification of GHG emissions.

County of Merced

General Plan. The City of Merced addresses air quality in the Air Quality Element of the County's General Plan.[12] The Air Quality Element includes goals and policies that work to reduce air pollutants and GHG emissions and anticipate adaptation due to future consequences of global and local climate change, mitigate significant local and regional air quality impacts of projects through the CEQA process, improve air quality through improved public facilities and operations and to serve as a model for the private sector, reduce traffic congestion and vehicle trips through more efficient infrastructure and support for trip reduction programs, protect County residents from toxic air pollutants and noxious odors from industrial, manufacturing, and processing facilities, and agricultural operations, and improve air quality in Merced County by reducing emissions of PM_{10}, $PM_{2.5}$, and other particulates from mobile and non-mobile sources. The following policies and implementing actions from the Air Quality Element would be applicable to the proposed project.

- **Policy AQ-2.1: Air Quality Plan Compliance (RDR).** Require all development projects to comply with applicable regional air quality plans and policies.

- **Policy AQ-2.2: Development Review Process (RDR).** Use the development review process to achieve measurable reductions in criteria pollutant, toxic air contaminants, and greenhouse gas emissions.

- **Policy AQ-2.3: Cumulative Impacts (RDR).** Encourage the reduction of cumulative air quality impacts produced by projects that are not significant by themselves, but result in cumulatively significant impacts in combination with other development.

- **Policy AQ-2.4: Mitigation (RDR).** Require that local and regional air quality impacts identified during CEQA review for projects reviewed and approved by the County are consistently and fairly mitigated.

- **Policy AQ-2.7: Air District Best Performance Standards (RDR).** Require the County to use the Best Performance Standards adopted by SJVAPCD during the development review and decision-making process to ensure new projects meet the targets set by the district.

- **Policy AQ-5.1: Residential Buffers.** Require effective buffers between residential and other sensitive land uses, and nonresidential land uses that generate hazardous air emissions such as highways (e.g., I-5 and SR-99), trucking centers, gasoline dispensing facilities, and dry cleaners. Effective buffers shall be determined by requiring consultation with the SJVAPCD for any project that may have a health risk impact, including those projects that would otherwise appear to be exempt from CEQA requirements.

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[12] Merced, County of, 2013. 2030 *Merced County General Plan*. December 10. Website: https://www.co.merced.ca.us/DocumentCenter/View/6766/2030-General-Plan?bidId= (accessed October 2019).

- **Policy AQ-5.2: New Point Sources**. Require new air pollution point sources such as, but not limited to, industrial, manufacturing, and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.

- **Policy AQ-6.1: Particulate Emissions from Construction**. Support the San Joaquin Valley Air Pollution Control District's efforts to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible and consistent with State and Federal regulations.

- **Policy AQ-6.2: Emissions from County Roads**. Require PM_{10} and $PM_{2.5}$ emission reductions on County-maintained roads to the maximum extent feasible and consistent with State and Federal regulations.

- **Policy AQ-6.3: Paving Materials**. Require all access roads, driveways, and parking areas serving new commercial and industrial development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use.

THRESHOLDS OF SIGNIFICANCE

The State CEQA Guidelines indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under an applicable federal or state ambient air quality standard;

- Expose sensitive receptors to substantial pollutant concentrations; or

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

A threshold of significance is defined by the SJVAPCD in its GAMAQI[13] as an identifiable quantitative, qualitative, or performance level of a particular environmental effect. Non-compliance with a threshold of significance means the effect will normally be determined to be significant. Compliance with a threshold of significance means the effect normally will be determined to be less than significant. The SJVAPCD has established thresholds of significance for criteria pollutant emissions generated during construction and operation of projects as shown in Table 2 below.

[13] San Joaquin Valley Air Pollution Control District, 2015, op. cit.

Table 2: SJVAPCD Construction and Operation Thresholds of Significance (Tons per Year)

	CO	NO_x	ROG	SO_x	PM_{10}	$PM_{2.5}$
Construction Thresholds	100	10	10	27	15	15
Operation Thresholds	100	10	10	27	15	15

Source: SJVAPCD, 2015. Guidance for Assessing and Mitigating Air Quality Impacts. March 19.

The emissions thresholds in the SJVAPCD GAMAQI were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse green-house gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

The SJVAPCD's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*[14] suggests project GHG emissions would considered less than significant if a project meets any of the following conditions: is exempt from CEQA requirements; complies with an approved GHG emission reduction plan or GHG mitigation program; or implements BPS. Additionally, projects that demonstrate that GHG emissions would be reduced or mitigated by at least 29 percent compared to BAU, including GHG emission reductions achieved since the 2002-2004 baseline period, would be considered less than significant.

IMPACTS AND MITIGATION MEASURES

The proposed project would release emissions over the short term as a result of construction activities, and over the long term from traffic generation and operation of the project. Emissions would include criteria air pollutants and GHG emissions. The sections below describe the proposed project's consistency with applicable air quality plans, estimated project emissions, and the significance of impacts with respect to SJVAPCD thresholds.

[14] San Joaquin Valley Air Pollution Control District, 2009. *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*. December 17. Available online at: www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf (accessed October 2019).

Air Quality Impacts

Consistency with Applicable Air Quality Plans

An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a non-attainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the SJVAPCD has developed the 2013 Plan for the Revoked 1-Hour Ozone Standard (Ozone Plan), adopted on September 19, 2013.[15] The SJVAPCD also adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.[16]

To assure the SJVAB's continued attainment of the USEPA PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007.[17] SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions) is designed to reduce PM_{10} emissions generated by human activity. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards in November 2018 to address the USEPA 1997 annual $PM_{2.5}$ standard of 15 µg/m^3 and 24-hour $PM_{2.5}$ standard of 65 µg/m^3, the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m^3, and the 2012 annual $PM_{2.5}$ standard of 12 µg/m^3.[18]

CEQA requires that certain proposed projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, construction of the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of Mitigation Measure AIR-1 would further reduce construction dust impacts. Operational emissions associated with the proposed project would also not exceed SJVAPCD established significance thresholds. Therefore, the proposed project would not conflict with or obstruct implementation of SJVAPCD air quality plans.

Criteria Pollutant Analysis

The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards. The SJVAPCD's nonattainment status is attributed to the region's development history. Past, present, and future development projects

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15 San Joaquin Valley Air Pollution Control District, 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. September 19. Website: www.valleyair.org/Air_Quality_Plans/Ozone-OneHourPlan-2013.htm (accessed October 2019).

16 San Joaquin Valley Air Pollution Control District, 2016. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16. Website: www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed October 2019).

17 San Joaquin Valley Air Pollution Control District, 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. Available online at: www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed October 2019).

18 San Joaquin Valley Air Pollution Control District, 2018. *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards*. November 15. Website: http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed October 2019).

contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SJVAPCD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The following analysis assesses the potential project-level construction- and operation-related air quality impacts.

Short-Term Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by grading, paving, building, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, Reactive Organic Gas (ROG), directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and TACs such as diesel exhaust particulate matter.

Project construction activities would include grading, paving, and building activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SJVAPCD has implemented Regulation VIII measures for reducing fugitive dust emissions (PM_{10}). With the implementation of Regulation VIII measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, volatile organic compounds (VOCs) and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod, consistent with SJVAPCD recommendations. As identified in the Project Description, the Well 22 Project would be constructed

in three phases. Construction of the project is anticipated to start in April 2021 and end in April 2024. The total time for completing all phases is estimated at 36 months, which was included in the CalEEMod analysis. Construction-related emissions are presented in Table 3, below. CalEEMod output sheets are attached.

Table 3: Project Construction Emissions (Tons per Year)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Project Construction Emissions	0.2	1.9	1.9	<0.1	0.6	0.3
SJVAPCD Significance Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (October 2019).

As shown in Table 3, construction emissions associated with the project would not exceed the SJVAPD's thresholds for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. These control measures are intended to reduce the amount of PM_{10} emissions during the construction period. Implementation of Mitigation Measure AIR-1 would ensure that the proposed project complies with Regulation VIII and further reduces the short-term construction period air quality impacts.

Mitigation Measure AIR-1 Consistent with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

- 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, covered with a tarp or other suitable cover 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 be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and 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 the end of each workday. (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.)

- Following the addition of materials to, or the removal of materials from, the surface of out-door storage piles, said piles shall be effectively stabilized of fugitive dust emission utilizing sufficient water or chemical stabilizer/suppressant.

As shown in Table 3, construction emissions associated with the project would be less than significant with implementation of Mitigation Measure AIR-1. Therefore, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Operational Emissions. Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity), and area sources (e.g., landscape maintenance equipment use) related to the proposed project. The proposed project would also generate stationary source emissions associated with an emergency backup generator.

PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles.

Energy source emissions typically result from activities in buildings for which electricity and natural gas are used. The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Sources of energy demand for the proposed project could include mechanical systems, such as lighting, booster pumps, and process equipment. Area source emissions associated with the project would include emissions from the use of architectural coatings and maintenance equipment. The proposed project would also generate stationary source emissions associated with an emergency backup generator.

Emission estimates for operation of the project were calculated using CalEEMod and are shown in Table 4, below. For purposes of evaluating the proposed project, the county in CalEEMod was specified as Merced County and the climate zone of 3 was selected with the rural land use setting. Based on this climate zone, CalEEMod assumed a wind speed of 2.2 meters per second and precipitation frequency of 49 days per year. The operational year was assumed to be 2024. The utility company for the region was selected as Pacific Gas & Electric Company (PG&E) and the CO_2 intensity was determined to be 328.8 pounds per megawatt hour based on a 5-year average estimated by PG&E.

The CalEEMod analysis assumed 1.84 acres of General Light Industry land uses to account for Well 22, the water storage tank, and associated infrastructure. The project is anticipated to be operational in April 2024. This analysis assumes that one employee would visit the site daily, which would result in a total of two vehicle trips per day, which was included in the CalEEMod analysis. Where project-specific data were not available, default assumptions from CalEEMod were used to estimate project emissions. The annual emissions associated with project operational trip generation, energy, and area sources are identified in Table 4 for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

Table 4: Project Operation Emissions (Tons per Year)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions	0.4	<0.1	<0.1	0.0	0.0	0.0
Energy Source Emissions	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Mobile Source Emissions	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Stationary Source Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Project Operation Emissions	**0.4**	**0.2**	**0.2**	**<0.1**	**<0.1**	**<0.1**
SJVAPCD Significance Threshold	10.0	10.0	100	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (October 2019).

As shown in Table 4, long-term operational emissions associated with the proposed project would be minimal and would be well below SJVAPCD significance thresholds. Therefore, the proposed project would not 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 AAQS.

Sensitive Receptors

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road.

Construction activities associated with the proposed project would generate airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. However, construction contractors would be required to implement measures to reduce or eliminate emissions by following SJVAPCD Regulation VIII, as described above. Project construction emissions would be well below SJVAPCD significance thresholds. The proposed project would include an emergency backup generator; however, as identified in Table 4, project operational emissions of criteria pollutants would be below SJVAPCD significance thresholds; thus, they are not likely to have a significant impact on nearby residences given the distance and the dispersion that would occur. Compliance with SJVAPCD rules would further reduce potential health risk related to a level that is not significant. Therefore, nearby sensitive receptors would not be exposed to a risk that equals or

exceeds 20 in one million in regards to carcinogenic TACs. In addition, nearby sensitive receptors would not be exposed to a risk that equals or exceeds a health index of 1 for non-carcinogenic TACs. Therefore, operation emissions from the project would not result in a substantial health risk. The proposed project would not expose sensitive receptors to substantial pollutant concentrations.

Objectionable Odors

The SJVAPCD addresses odor criteria within the GAMAQI. The district has not established a rule or standard regarding odor emissions, rather, the district has a nuisance rule: "Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact."

During project construction, some odors may be present due to diesel exhaust. However, these odors would be temporary and limited to the construction period. The proposed project would not include any activities or operations that would generate objectionable odors and once operational, the project would not be a source of odors. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Greenhouse Gas Impacts

Generate Greenhouse Gas Emissions

This section discusses the project's impacts related to the release of GHG emissions for both construction and operational phases of the project.

Construction GHG Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that construction of the project would generate a total of approximately 923.3 metric tons of CO_2e. When considered over the 30-year life of the project, the total amortized construction emissions would be 30.8 metric tons of CO_2e per year.

Operational GHG Emissions. Long-term GHG emissions are typically generated from mobile, area, waste, and water sources as well as indirect emissions from sources associated with energy consumption. Mobile-source GHG emissions would include project-generated trips to and from the project site. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions are typically generated at off-site utility providers as a result of increased electricity demand generated by a project. Stationary source emissions would be associated with the emergency backup generator. Waste source emissions

generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by pumping of water, water treatment, water distribution, and wastewater treatment.

Operational emissions were estimated using CalEEMod and the results are presented in Table 5. CalEEMod output sheets are attached.

Table 5: Operational GHG Emissions

Emissions Source Category	Operational Emissions (Metric Tons per Year)				
	CO_2	CH_4	N_2O	CO_2e	Percent of Total
Area	<0.1	0.0	0.0	<0.1	0
Energy	194.3	<0.1	<0.1	195.7	68
Mobile	46.3	<0.1	0.0	46.4	16
Stationary	1.7	<0.1	0.0	1.7	1
Waste	2.0	0.1	0.0	5.0	1
Water	20.8	0.6	<0.1	40.2	14
Total Operational				**289.0**	**100**

Source: LSA (October 2019).

The proposed project would generate approximately289.0 metric tons of CO_2e per year of emissions, as shown in Table 5. The SJVAPCD has not established a numeric threshold for GHG emissions. The project would include the construction a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the DDW Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations. Based on the emission estimates shown in Table 5, the proposed project would generate minimal GHG emissions and therefore would not result in the generation of substantial GHG emissions.

Consistency with Greenhouse Gas Reduction Plans

The County of Merced is currently developing a Climate Action Plan (CAP), which is a strategy for how it will reduce its greenhouse gas emissions in accordance with statewide targets. The SJVAPCD has adopted a CCAP, which includes suggested BPS for proposed development projects. Appendix J of the SJVAPCD Final Staff Report for the CCAP contains GHG reduction measures; however these measures are intended for commercial, residential, and mixed-use projects and wouldn't be applicable to the proposed project.

As discussed above, the proposed project would include the construction of a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the DDW Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations. The GHG reduction opportunities included in the CAP are intended for new commercial, residential, and

mixed-use development projects and wouldn't be applicable to the proposed project. Therefore, the following discussion evaluates the proposed project according to the goals of AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 requires CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

Executive Order Executive Order B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[19] to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, Executive Order B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as discussed below.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. Energy usage associated with operation of the proposed project would be relatively small in comparison to the State's available energy sources and energy impacts would be negligible at the regional level. Therefore, the proposed project would not conflict with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. The purpose of the project is to construct a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the DDW Waterworks

[19] California Air Resources Board, 2017. *California's 2017 Climate Change Scoping Plan*. November.

Standards following the removal of service of Well 7B due to elevated nitrate concentrations. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. In addition, as discussed above, this analysis assumes that one employee would visit the site daily, which would result in a total of two vehicle trips per day; therefore, the project would result in minimal additional vehicle trips and would not conflict with reduction targets for passenger vehicles. Therefore, the proposed project would not conflict with policies and regulations that have been adopted for the purpose of reducing GHG from transportation sources.

The proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197 and would be consistent with applicable state plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

CONCLUSION

Based on the analysis presented above, construction of the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of Mitigation Measure AIR-1 would further reduce construction dust impacts. As discussed above, the proposed project's construction emissions of criteria pollutants are estimated to be well below the emissions threshold established for the region. Operational emissions associated with the proposed project would also not exceed SJVAPCD established significance thresholds. The proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The proposed project would also not result in objectionable odors affecting a substantial number of people. As shown in the analysis above, the project would not result in the emission of substantial GHG emissions during construction or operation of the project. Additionally, the project would not conflict with the goals and objectives of the SJVAPCD CCAP, with the provisions of the California Scoping Plan, or any other State or regional plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. Therefore, the proposed project's incremental contribution to cumulative GHG emissions would not be cumulatively considerable.

Attachments:

Figure 1 – Project Location and Regional Vicinity Map
Figure 2 – Aerial Photograph of the Project Site and Surrounding Land Uses
Figure 3 – Conceptual Site Plan
CalEEMod Output Sheets

LSA

LEGEND

Project Site

FIGURE 1

N

0 750 1500

FEET

SOURCE: ESRI World Maps (08/19); Google Maps Sat (08/2019).

I:\MED1901\GIS\Maps\Figure 1_Project Location and Regional Vicinity Map.mxd (10/8/2019)

Merced Municipal Well Site 22 Project

Project Location and Regional Vicinity Map

LSA

FIGURE 2

0 500 1000
FEET

N

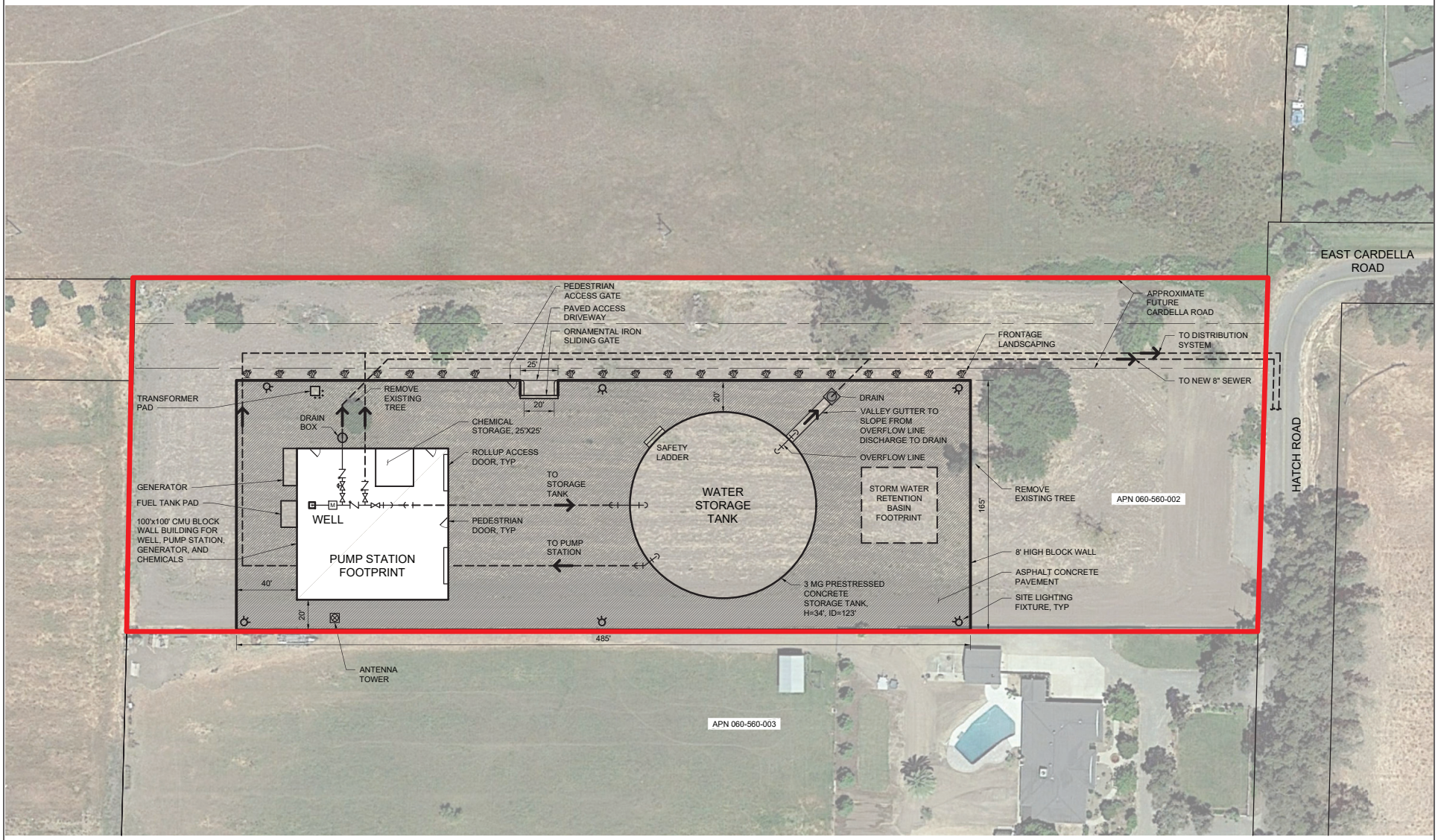
Project Site

Merced Municipal Well Site 22 Project

Aerial Photograph of the Project Site and Surrounding Land Uses

SOURCES: GOOGLE EARTH, 5-16-18; LSA, 2019.

FRE10\P\MED1901 Municipal Well Site #22\PRODUCTS\Figures\Fig_2.ai (10/2/19)



LSA

FIGURE 3

0 60 120
FEET

N

Project Site

Merced Municipal Well Site 22 Project
Conceptual Site Plan

SOURCE: MKN, 2019.

FRE10\P\MED1901 Municipal Well Site #22\PRODUCTS\Figures\Figure_3.ai (10/2/19)

Municipal Well Site 22 Project

Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	80.00	1000sqft	1.84	80,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Municipal Well Site 22 Project - Merced County, Annual

Project Characteristics - CO2 intensity factor based on 5-year average (PG&E 2015)

Land Use - The proposed well site is located within a 4.01-acre parcel; however Well 22, the water storage tank, and associated infrastructure would be located within the parcel in an area approximately 1.84 acres (approximately 80,000 sq ft)

Construction Phase - The total time for completing all phases is estimated at 36 months. Construction of the project is anticipated to start in April 2021 and end in April 2024.

Off-road Equipment - Equipment list based on equipment list for similar project (Well 21)

Off-road Equipment - Equipment list based on equipment list for similar project (Well 21)

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Off-road Equipment - Equipment list based on equipment list for similar project (Well 21)

Off-road Equipment - Equipment list based on equipment list for similar project (Well 21)

Vehicle Trips - Assuming one employee would visit the site per day.

Stationary Sources - Emergency Generators and Fire Pumps - The project would include an emergency backup generator, which would be used for testing approximately 15 minutes per month

Solid Waste - Reduced solid waste generation as this analysis assumes one employee would visit the site per day.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	90.00
tblConstructionPhase	NumDays	4.00	90.00
tblConstructionPhase	NumDays	200.00	180.00
tblConstructionPhase	NumDays	200.00	180.00
tblConstructionPhase	NumDays	10.00	65.00
tblGrading	AcresOfGrading	45.00	1.50
tblOffRoadEquipment	HorsePower	231.00	375.00
tblOffRoadEquipment	HorsePower	89.00	75.00
tblOffRoadEquipment	HorsePower	187.00	173.00
tblOffRoadEquipment	HorsePower	130.00	175.00
tblOffRoadEquipment	HorsePower	132.00	175.00
tblOffRoadEquipment	HorsePower	80.00	36.00

tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	221.00	1,200.00
tblOffRoadEquipment	HorsePower	402.00	330.00
tblOffRoadEquipment	HorsePower	402.00	330.00
tblOffRoadEquipment	HorsePower	172.00	200.00
tblOffRoadEquipment	HorsePower	8.00	157.00
tblOffRoadEquipment	HorsePower	8.00	157.00
tblOffRoadEquipment	HorsePower	8.00	157.00
tblOffRoadEquipment	HorsePower	203.00	75.00
tblOffRoadEquipment	HorsePower	65.00	75.00
tblOffRoadEquipment	HorsePower	65.00	75.00
tblOffRoadEquipment	HorsePower	65.00	75.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	99.20	10.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	50.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.01

tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	91.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	VendorTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	5.00
tblTripsAndVMT	WorkerTripNumber	13.00	8.00
tblTripsAndVMT	WorkerTripNumber	20.00	15.00
tblVehicleTrips	ST_TR	1.32	0.25
tblVehicleTrips	SU_TR	0.68	0.25
tblVehicleTrips	WD_TR	6.97	0.25

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1950	1.9353	1.1655	2.4700e-003	0.4760	0.0909	0.5670	0.2477	0.0839	0.3316	0.0000	216.7937	216.7937	0.0649	0.0000	218.4169
2022	0.2236	1.7282	1.8226	3.9200e-003	0.0489	0.0760	0.1248	0.0131	0.0721	0.0853	0.0000	337.5693	337.5693	0.0703	0.0000	339.3276
2023	0.1995	1.5507	1.9392	3.4600e-003	0.0437	0.0682	0.1120	0.0116	0.0648	0.0765	0.0000	293.9482	293.9482	0.0601	0.0000	295.4501
2024	0.0402	0.3245	0.4961	8.0000e-004	7.1000e-003	0.0147	0.0218	1.8900e-003	0.0136	0.0154	0.0000	69.5633	69.5633	0.0199	0.0000	70.0601
Maximum	**0.2236**	**1.9353**	**1.9392**	**3.9200e-003**	**0.4760**	**0.0909**	**0.5670**	**0.2477**	**0.0839**	**0.3316**	**0.0000**	**337.5693**	**337.5693**	**0.0703**	**0.0000**	**339.3276**

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					
2021	0.1950	1.9353	1.1655	2.4700e-003	0.4760	0.0909	0.5670	0.2477	0.0839	0.3316	0.0000	216.7934	216.7934	0.0649	0.0000	218.4167
2022	0.2236	1.7282	1.8226	3.9200e-003	0.0489	0.0760	0.1248	0.0131	0.0721	0.0853	0.0000	337.5690	337.5690	0.0703	0.0000	339.3273
2023	0.1995	1.5507	1.9392	3.4600e-003	0.0437	0.0682	0.1120	0.0116	0.0648	0.0765	0.0000	293.9479	293.9479	0.0601	0.0000	295.4498
2024	0.0402	0.3245	0.4961	8.0000e-004	7.1000e-003	0.0147	0.0218	1.8900e-003	0.0136	0.0154	0.0000	69.5632	69.5632	0.0199	0.0000	70.0601
Maximum	**0.2236**	**1.9353**	**1.9392**	**3.9200e-003**	**0.4760**	**0.0909**	**0.5670**	**0.2477**	**0.0839**	**0.3316**	**0.0000**	**337.5690**	**337.5690**	**0.0703**	**0.0000**	**339.3273**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-5-2021**	**7-4-2021**	0.6903	0.6903
2	**7-5-2021**	**10-4-2021**	0.7068	0.7068
3	**10-5-2021**	**1-4-2022**	0.7147	0.7147
4	**1-5-2022**	**4-4-2022**	0.6304	0.6304
5	**4-5-2022**	**7-4-2022**	0.6365	0.6365
6	**7-5-2022**	**10-4-2022**	0.4329	0.4329
7	**10-5-2022**	**1-4-2023**	0.2319	0.2319
8	**1-5-2023**	**4-4-2023**	0.2101	0.2101

9	**4-5-2023**	**7-4-2023**	0.4469	0.4469
10	**7-5-2023**	**10-4-2023**	0.5534	0.5534
11	**10-5-2023**	**1-4-2024**	0.5527	0.5527
12	**1-5-2024**	**4-4-2024**	0.3201	0.3201
13	**4-5-2024**	**7-4-2024**	0.0036	0.0036
		Highest	0.7147	0.7147

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	0.3681	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003
Energy	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	194.3302	194.3302	0.0110	3.5500e-003	195.6640
Mobile	7.4400e-003	0.0839	0.0844	5.0000e-004	0.0296	2.9000e-004	0.0299	7.9600e-003	2.7000e-004	8.2400e-003	0.0000	46.2835	46.2835	2.7500e-003	0.0000	46.3523
Stationary	3.7300e-003	0.0122	0.0136	2.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.7326	1.7326	2.4000e-004	0.0000	1.7387
Waste						0.0000	0.0000		0.0000	0.0000	2.0299	0.0000	2.0299	0.1200	0.0000	5.0290
Water						0.0000	0.0000		0.0000	0.0000	5.8692	14.9296	20.7988	0.6041	0.0145	40.2251
Total	**0.3883**	**0.1779**	**0.1675**	**1.0100e-003**	**0.0296**	**7.0600e-003**	**0.0366**	**7.9600e-003**	**7.0400e-003**	**0.0150**	**7.8991**	**257.2773**	**265.1764**	**0.7381**	**0.0181**	**289.0107**

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	0.3681	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003
Energy	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	194.3302	194.3302	0.0110	3.5500e-003	195.6640
Mobile	7.4400e-003	0.0839	0.0844	5.0000e-004	0.0296	2.9000e-004	0.0299	7.9600e-003	2.7000e-004	8.2400e-003	0.0000	46.2835	46.2835	2.7500e-003	0.0000	46.3523
Stationary	3.7300e-003	0.0122	0.0136	2.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.7326	1.7326	2.4000e-004	0.0000	1.7387
Waste						0.0000	0.0000		0.0000	0.0000	2.0299	0.0000	2.0299	0.1200	0.0000	5.0290
Water						0.0000	0.0000		0.0000	0.0000	5.8692	14.9296	20.7988	0.6041	0.0145	40.2251
Total	**0.3883**	**0.1779**	**0.1675**	**1.0100e-003**	**0.0296**	**7.0600e-003**	**0.0366**	**7.9600e-003**	**7.0400e-003**	**0.0150**	**7.8991**	**257.2773**	**265.1764**	**0.7381**	**0.0181**	**289.0107**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/5/2021	8/6/2021	5	90	
2	Grading	Grading	8/9/2021	12/10/2021	5	90	
3	Drilling and Well Construction	Building Construction	12/13/2021	8/19/2022	5	180	
4	Trenching	Trenching	8/22/2022	4/28/2023	5	180	
5	Foundation, Building Construction, Pump Installation	Building Construction	5/1/2023	1/5/2024	5	180	
6	Paving	Paving	1/8/2024	4/5/2024	5	65	

Acres of Grading (Site Preparation Phase): 45

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Grading	Graders	1	8.00	173	0.41
Grading	Off-Highway Trucks	1	8.00	330	0.38
Grading	Plate Compactors	1	8.00	157	0.43
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Drilling and Well Construction	Bore/Drill Rigs	1	8.00	1200	0.50
Drilling and Well Construction	Cranes	1	6.00	231	0.29

Drilling and Well Construction	Forklifts	1	6.00	89	0.20
Drilling and Well Construction	Generator Sets	1	8.00	84	0.74
Drilling and Well Construction	Off-Highway Trucks	1	8.00	330	0.38
Drilling and Well Construction	Other Construction Equipment	1	8.00	200	0.42
Drilling and Well Construction	Tractors/Loaders/Backhoes	1	8.00	75	0.37
Drilling and Well Construction	Welders	3	8.00	46	0.45
Trenching	Plate Compactors	1	8.00	157	0.43
Trenching	Rubber Tired Loaders	1	8.00	75	0.36
Trenching	Skid Steer Loaders	1	8.00	75	0.37
Trenching	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Foundation, Building Construction, Pump Installation	Cranes	1	8.00	375	0.29
Foundation, Building Construction, Pump Installation	Forklifts	1	8.00	75	0.20
Foundation, Building Construction, Pump Installation	Generator Sets	1	8.00	84	0.74
Foundation, Building Construction, Pump Installation	Skid Steer Loaders	1	8.00	75	0.37
Foundation, Building Construction, Pump Installation	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Foundation, Building Construction, Pump Installation	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	175	0.42
Paving	Paving Equipment	1	8.00	175	0.36
Paving	Plate Compactors	1	8.00	157	0.43
Paving	Rollers	2	8.00	36	0.38
Paving	Skid Steer Loaders	1	8.00	75	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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	4	5.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	8.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Drilling and Well Construction	10	34.00	13.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	5	13.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Foundation, Building Construction, Pump In	8	34.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					
Fugitive Dust					0.2610	0.0000	0.2610	0.1329	0.0000	0.1329	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0790	0.8745	0.4482	9.2000e-004		0.0398	0.0398		0.0366	0.0366	0.0000	81.0763	81.0763	0.0262	0.0000	81.7319
Total	**0.0790**	**0.8745**	**0.4482**	**9.2000e-004**	**0.2610**	**0.0398**	**0.3008**	**0.1329**	**0.0366**	**0.1695**	**0.0000**	**81.0763**	**81.0763**	**0.0262**	**0.0000**	**81.7319**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-003	9.6000e-004	9.9200e-003	3.0000e-005	2.7900e-003	2.0000e-005	2.8100e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.4404	2.4404	7.0000e-005	0.0000	2.4422
Total	**1.3000e-003**	**9.6000e-004**	**9.9200e-003**	**3.0000e-005**	**2.7900e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.4404**	**2.4404**	**7.0000e-005**	**0.0000**	**2.4422**

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					0.2610	0.0000	0.2610	0.1329	0.0000	0.1329	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0790	0.8745	0.4482	9.2000e-004		0.0398	0.0398		0.0366	0.0366	0.0000	81.0762	81.0762	0.0262	0.0000	81.7318
Total	**0.0790**	**0.8745**	**0.4482**	**9.2000e-004**	**0.2610**	**0.0398**	**0.3008**	**0.1329**	**0.0366**	**0.1695**	**0.0000**	**81.0762**	**81.0762**	**0.0262**	**0.0000**	**81.7318**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-003	9.6000e-004	9.9200e-003	3.0000e-005	2.7900e-003	2.0000e-005	2.8100e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.4404	2.4404	7.0000e-005	0.0000	2.4422
Total	**1.3000e-003**	**9.6000e-004**	**9.9200e-003**	**3.0000e-005**	**2.7900e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.4404**	**2.4404**	**7.0000e-005**	**0.0000**	**2.4422**

3.3 Grading - 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					
Fugitive Dust					0.2040	0.0000	0.2040	0.1118	0.0000	0.1118	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0935	0.9118	0.5588	1.1800e-003		0.0447	0.0447		0.0411	0.0411	0.0000	103.3634	103.3634	0.0334	0.0000	104.1992
Total	**0.0935**	**0.9118**	**0.5588**	**1.1800e-003**	**0.2040**	**0.0447**	**0.2487**	**0.1118**	**0.0411**	**0.1529**	**0.0000**	**103.3634**	**103.3634**	**0.0334**	**0.0000**	**104.1992**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0800e-003	1.5300e-003	0.0159	4.0000e-005	4.4600e-003	3.0000e-005	4.5000e-003	1.1900e-003	3.0000e-005	1.2200e-003	0.0000	3.9046	3.9046	1.2000e-004	0.0000	3.9075
Total	**2.0800e-003**	**1.5300e-003**	**0.0159**	**4.0000e-005**	**4.4600e-003**	**3.0000e-005**	**4.5000e-003**	**1.1900e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.9046**	**3.9046**	**1.2000e-004**	**0.0000**	**3.9075**

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					0.2040	0.0000	0.2040	0.1118	0.0000	0.1118	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0935	0.9118	0.5588	1.1800e-003		0.0447	0.0447		0.0411	0.0411	0.0000	103.3633	103.3633	0.0334	0.0000	104.1991
Total	**0.0935**	**0.9118**	**0.5588**	**1.1800e-003**	**0.2040**	**0.0447**	**0.2487**	**0.1118**	**0.0411**	**0.1529**	**0.0000**	**103.3633**	**103.3633**	**0.0334**	**0.0000**	**104.1991**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0800e-003	1.5300e-003	0.0159	4.0000e-005	4.4600e-003	3.0000e-005	4.5000e-003	1.1900e-003	3.0000e-005	1.2200e-003	0.0000	3.9046	3.9046	1.2000e-004	0.0000	3.9075
Total	**2.0800e-003**	**1.5300e-003**	**0.0159**	**4.0000e-005**	**4.4600e-003**	**3.0000e-005**	**4.5000e-003**	**1.1900e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.9046**	**3.9046**	**1.2000e-004**	**0.0000**	**3.9075**

3.4 Drilling and Well 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	0.0174	0.1350	0.1193	2.5000e-004		6.3400e-003	6.3400e-003		6.0700e-003	6.0700e-003	0.0000	20.8045	20.8045	4.7600e-003	0.0000	20.9234
Total	**0.0174**	**0.1350**	**0.1193**	**2.5000e-004**		**6.3400e-003**	**6.3400e-003**		**6.0700e-003**	**6.0700e-003**	**0.0000**	**20.8045**	**20.8045**	**4.7600e-003**	**0.0000**	**20.9234**

3.4 Drilling and Well Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2000e-004	0.0104	2.1500e-003	3.0000e-005	5.8000e-004	3.0000e-005	6.1000e-004	1.7000e-004	3.0000e-005	2.0000e-004	0.0000	2.4387	2.4387	2.5000e-004	0.0000	2.4450
Worker	1.4800e-003	1.0800e-003	0.0112	3.0000e-005	3.1600e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.7658	2.7658	8.0000e-005	0.0000	2.7678
Total	**1.8000e-003**	**0.0115**	**0.0134**	**6.0000e-005**	**3.7400e-003**	**5.0000e-005**	**3.8000e-003**	**1.0100e-003**	**5.0000e-005**	**1.0600e-003**	**0.0000**	**5.2045**	**5.2045**	**3.3000e-004**	**0.0000**	**5.2128**

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	0.0174	0.1350	0.1193	2.5000e-004		6.3400e-003	6.3400e-003		6.0700e-003	6.0700e-003	0.0000	20.8044	20.8044	4.7600e-003	0.0000	20.9233
Total	**0.0174**	**0.1350**	**0.1193**	**2.5000e-004**		**6.3400e-003**	**6.3400e-003**		**6.0700e-003**	**6.0700e-003**	**0.0000**	**20.8044**	**20.8044**	**4.7600e-003**	**0.0000**	**20.9233**

3.4 Drilling and Well Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2000e-004	0.0104	2.1500e-003	3.0000e-005	5.8000e-004	3.0000e-005	6.1000e-004	1.7000e-004	3.0000e-005	2.0000e-004	0.0000	2.4387	2.4387	2.5000e-004	0.0000	2.4450
Worker	1.4800e-003	1.0800e-003	0.0112	3.0000e-005	3.1600e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.7658	2.7658	8.0000e-005	0.0000	2.7678
Total	**1.8000e-003**	**0.0115**	**0.0134**	**6.0000e-005**	**3.7400e-003**	**5.0000e-005**	**3.8000e-003**	**1.0100e-003**	**5.0000e-005**	**1.0600e-003**	**0.0000**	**5.2045**	**5.2045**	**3.3000e-004**	**0.0000**	**5.2128**

3.4 Drilling and Well 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	0.1721	1.3065	1.2817	2.7200e-003		0.0586	0.0586		0.0562	0.0562	0.0000	228.9023	228.9023	0.0517	0.0000	230.1942
Total	**0.1721**	**1.3065**	**1.2817**	**2.7200e-003**		**0.0586**	**0.0586**		**0.0562**	**0.0562**	**0.0000**	**228.9023**	**228.9023**	**0.0517**	**0.0000**	**230.1942**

3.4 Drilling and Well Construction - 2022

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	3.2800e-003	0.1085	0.0214	2.8000e-004	6.4200e-003	2.9000e-004	6.7100e-003	1.8600e-003	2.8000e-004	2.1300e-003	0.0000	26.5764	26.5764	2.7100e-003	0.0000	26.6440
Worker	0.0150	0.0107	0.1127	3.2000e-004	0.0348	2.5000e-004	0.0350	9.2400e-003	2.3000e-004	9.4700e-003	0.0000	29.3327	29.3327	8.0000e-004	0.0000	29.3528
Total	**0.0183**	**0.1191**	**0.1341**	**6.0000e-004**	**0.0412**	**5.4000e-004**	**0.0417**	**0.0111**	**5.1000e-004**	**0.0116**	**0.0000**	**55.9091**	**55.9091**	**3.5100e-003**	**0.0000**	**55.9968**

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	0.1721	1.3065	1.2817	2.7200e-003		0.0586	0.0586		0.0562	0.0562	0.0000	228.9020	228.9020	0.0517	0.0000	230.1939
Total	**0.1721**	**1.3065**	**1.2817**	**2.7200e-003**		**0.0586**	**0.0586**		**0.0562**	**0.0562**	**0.0000**	**228.9020**	**228.9020**	**0.0517**	**0.0000**	**230.1939**

3.4 Drilling and Well Construction - 2022

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	3.2800e-003	0.1085	0.0214	2.8000e-004	6.4200e-003	2.9000e-004	6.7100e-003	1.8600e-003	2.8000e-004	2.1300e-003	0.0000	26.5764	26.5764	2.7100e-003	0.0000	26.6440
Worker	0.0150	0.0107	0.1127	3.2000e-004	0.0348	2.5000e-004	0.0350	9.2400e-003	2.3000e-004	9.4700e-003	0.0000	29.3327	29.3327	8.0000e-004	0.0000	29.3528
Total	**0.0183**	**0.1191**	**0.1341**	**6.0000e-004**	**0.0412**	**5.4000e-004**	**0.0417**	**0.0111**	**5.1000e-004**	**0.0116**	**0.0000**	**55.9091**	**55.9091**	**3.5100e-003**	**0.0000**	**55.9968**

3.5 Trenching - 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	0.0299	0.3002	0.3821	5.3000e-004		0.0168	0.0168		0.0154	0.0154	0.0000	46.3005	46.3005	0.0150	0.0000	46.6749
Total	**0.0299**	**0.3002**	**0.3821**	**5.3000e-004**		**0.0168**	**0.0168**		**0.0154**	**0.0154**	**0.0000**	**46.3005**	**46.3005**	**0.0150**	**0.0000**	**46.6749**

3.5 Trenching - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-003	2.3500e-003	0.0248	7.0000e-005	7.6600e-003	5.0000e-005	7.7100e-003	2.0400e-003	5.0000e-005	2.0800e-003	0.0000	6.4574	6.4574	1.8000e-004	0.0000	6.4618
Total	**3.3000e-003**	**2.3500e-003**	**0.0248**	**7.0000e-005**	**7.6600e-003**	**5.0000e-005**	**7.7100e-003**	**2.0400e-003**	**5.0000e-005**	**2.0800e-003**	**0.0000**	**6.4574**	**6.4574**	**1.8000e-004**	**0.0000**	**6.4618**

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	0.0299	0.3002	0.3821	5.3000e-004		0.0168	0.0168		0.0154	0.0154	0.0000	46.3005	46.3005	0.0150	0.0000	46.6748
Total	**0.0299**	**0.3002**	**0.3821**	**5.3000e-004**		**0.0168**	**0.0168**		**0.0154**	**0.0154**	**0.0000**	**46.3005**	**46.3005**	**0.0150**	**0.0000**	**46.6748**

3.5 Trenching - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-003	2.3500e-003	0.0248	7.0000e-005	7.6600e-003	5.0000e-005	7.7100e-003	2.0400e-003	5.0000e-005	2.0800e-003	0.0000	6.4574	6.4574	1.8000e-004	0.0000	6.4618
Total	**3.3000e-003**	**2.3500e-003**	**0.0248**	**7.0000e-005**	**7.6600e-003**	**5.0000e-005**	**7.7100e-003**	**2.0400e-003**	**5.0000e-005**	**2.0800e-003**	**0.0000**	**6.4574**	**6.4574**	**1.8000e-004**	**0.0000**	**6.4618**

3.5 Trenching - 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	0.0248	0.2481	0.3409	4.7000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	41.4590	41.4590	0.0134	0.0000	41.7942
Total	**0.0248**	**0.2481**	**0.3409**	**4.7000e-004**		**0.0129**	**0.0129**		**0.0119**	**0.0119**	**0.0000**	**41.4590**	**41.4590**	**0.0134**	**0.0000**	**41.7942**

3.5 Trenching - 2023

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	2.7300e-003	1.8700e-003	0.0202	6.0000e-005	6.8500e-003	5.0000e-005	6.9000e-003	1.8200e-003	4.0000e-005	1.8600e-003	0.0000	5.5602	5.5602	1.4000e-004	0.0000	5.5638
Total	**2.7300e-003**	**1.8700e-003**	**0.0202**	**6.0000e-005**	**6.8500e-003**	**5.0000e-005**	**6.9000e-003**	**1.8200e-003**	**4.0000e-005**	**1.8600e-003**	**0.0000**	**5.5602**	**5.5602**	**1.4000e-004**	**0.0000**	**5.5638**

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	0.0248	0.2481	0.3409	4.7000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	41.4590	41.4590	0.0134	0.0000	41.7942
Total	**0.0248**	**0.2481**	**0.3409**	**4.7000e-004**		**0.0129**	**0.0129**		**0.0119**	**0.0119**	**0.0000**	**41.4590**	**41.4590**	**0.0134**	**0.0000**	**41.7942**

3.5 Trenching - 2023

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	2.7300e-003	1.8700e-003	0.0202	6.0000e-005	6.8500e-003	5.0000e-005	6.9000e-003	1.8200e-003	4.0000e-005	1.8600e-003	0.0000	5.5602	5.5602	1.4000e-004	0.0000	5.5638
Total	**2.7300e-003**	**1.8700e-003**	**0.0202**	**6.0000e-005**	**6.8500e-003**	**5.0000e-005**	**6.9000e-003**	**1.8200e-003**	**4.0000e-005**	**1.8600e-003**	**0.0000**	**5.5602**	**5.5602**	**1.4000e-004**	**0.0000**	**5.5638**

3.6 Foundation, Building Construction, Pump Installation - 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	0.1573	1.2907	1.4696	2.5900e-003		0.0550	0.0550		0.0527	0.0527	0.0000	216.9892	216.9892	0.0458	0.0000	218.1334
Total	**0.1573**	**1.2907**	**1.4696**	**2.5900e-003**		**0.0550**	**0.0550**		**0.0527**	**0.0527**	**0.0000**	**216.9892**	**216.9892**	**0.0458**	**0.0000**	**218.1334**

3.6 Foundation, Building Construction, Pump Installation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0147	0.0101	0.1085	3.3000e-004	0.0369	2.5000e-004	0.0371	9.8000e-003	2.3000e-004	0.0100	0.0000	29.9398	29.9398	7.6000e-004	0.0000	29.9587
Total	**0.0147**	**0.0101**	**0.1085**	**3.3000e-004**	**0.0369**	**2.5000e-004**	**0.0371**	**9.8000e-003**	**2.3000e-004**	**0.0100**	**0.0000**	**29.9398**	**29.9398**	**7.6000e-004**	**0.0000**	**29.9587**

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	0.1573	1.2907	1.4696	2.5900e-003		0.0550	0.0550		0.0527	0.0527	0.0000	216.9889	216.9889	0.0458	0.0000	218.1332
Total	**0.1573**	**1.2907**	**1.4696**	**2.5900e-003**		**0.0550**	**0.0550**		**0.0527**	**0.0527**	**0.0000**	**216.9889**	**216.9889**	**0.0458**	**0.0000**	**218.1332**

3.6 Foundation, Building Construction, Pump Installation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0147	0.0101	0.1085	3.3000e-004	0.0369	2.5000e-004	0.0371	9.8000e-003	2.3000e-004	0.0100	0.0000	29.9398	29.9398	7.6000e-004	0.0000	29.9587
Total	**0.0147**	**0.0101**	**0.1085**	**3.3000e-004**	**0.0369**	**2.5000e-004**	**0.0371**	**9.8000e-003**	**2.3000e-004**	**0.0100**	**0.0000**	**29.9398**	**29.9398**	**7.6000e-004**	**0.0000**	**29.9587**

3.6 Foundation, Building Construction, Pump Installation - 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	4.2300e-003	0.0351	0.0415	7.0000e-005		1.4000e-003	1.4000e-003		1.3400e-003	1.3400e-003	0.0000	6.1992	6.1992	1.2900e-003	0.0000	6.2316
Total	**4.2300e-003**	**0.0351**	**0.0415**	**7.0000e-005**		**1.4000e-003**	**1.4000e-003**		**1.3400e-003**	**1.3400e-003**	**0.0000**	**6.1992**	**6.1992**	**1.2900e-003**	**0.0000**	**6.2316**

3.6 Foundation, Building Construction, Pump Installation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.6000e-004	2.8600e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8255	0.8255	2.0000e-005	0.0000	0.8260
Total	**3.9000e-004**	**2.6000e-004**	**2.8600e-003**	**1.0000e-005**	**1.0500e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8255**	**0.8255**	**2.0000e-005**	**0.0000**	**0.8260**

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	4.2300e-003	0.0351	0.0415	7.0000e-005		1.4000e-003	1.4000e-003		1.3400e-003	1.3400e-003	0.0000	6.1992	6.1992	1.2900e-003	0.0000	6.2316
Total	**4.2300e-003**	**0.0351**	**0.0415**	**7.0000e-005**		**1.4000e-003**	**1.4000e-003**		**1.3400e-003**	**1.3400e-003**	**0.0000**	**6.1992**	**6.1992**	**1.2900e-003**	**0.0000**	**6.2316**

3.6 Foundation, Building Construction, Pump Installation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.6000e-004	2.8600e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8255	0.8255	2.0000e-005	0.0000	0.8260
Total	**3.9000e-004**	**2.6000e-004**	**2.8600e-003**	**1.0000e-005**	**1.0500e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8255**	**0.8255**	**2.0000e-005**	**0.0000**	**0.8260**

3.7 Paving - 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	0.0333	0.2877	0.4354	6.6000e-004		0.0132	0.0132		0.0122	0.0122	0.0000	57.8042	57.8042	0.0185	0.0000	58.2655
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0333**	**0.2877**	**0.4354**	**6.6000e-004**		**0.0132**	**0.0132**		**0.0122**	**0.0122**	**0.0000**	**57.8042**	**57.8042**	**0.0185**	**0.0000**	**58.2655**

3.7 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2400e-003	1.4900e-003	0.0164	5.0000e-005	6.0500e-003	4.0000e-005	6.0900e-003	1.6100e-003	4.0000e-005	1.6400e-003	0.0000	4.7344	4.7344	1.1000e-004	0.0000	4.7372
Total	**2.2400e-003**	**1.4900e-003**	**0.0164**	**5.0000e-005**	**6.0500e-003**	**4.0000e-005**	**6.0900e-003**	**1.6100e-003**	**4.0000e-005**	**1.6400e-003**	**0.0000**	**4.7344**	**4.7344**	**1.1000e-004**	**0.0000**	**4.7372**

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	0.0333	0.2877	0.4354	6.6000e-004		0.0132	0.0132		0.0122	0.0122	0.0000	57.8041	57.8041	0.0185	0.0000	58.2654
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0333**	**0.2877**	**0.4354**	**6.6000e-004**		**0.0132**	**0.0132**		**0.0122**	**0.0122**	**0.0000**	**57.8041**	**57.8041**	**0.0185**	**0.0000**	**58.2654**

3.7 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2400e-003	1.4900e-003	0.0164	5.0000e-005	6.0500e-003	4.0000e-005	6.0900e-003	1.6100e-003	4.0000e-005	1.6400e-003	0.0000	4.7344	4.7344	1.1000e-004	0.0000	4.7372
Total	**2.2400e-003**	**1.4900e-003**	**0.0164**	**5.0000e-005**	**6.0500e-003**	**4.0000e-005**	**6.0900e-003**	**1.6100e-003**	**4.0000e-005**	**1.6400e-003**	**0.0000**	**4.7344**	**4.7344**	**1.1000e-004**	**0.0000**	**4.7372**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	7.4400e-003	0.0839	0.0844	5.0000e-004	0.0296	2.9000e-004	0.0299	7.9600e-003	2.7000e-004	8.2400e-003	0.0000	46.2835	46.2835	2.7500e-003	0.0000	46.3523
Unmitigated	7.4400e-003	0.0839	0.0844	5.0000e-004	0.0296	2.9000e-004	0.0299	7.9600e-003	2.7000e-004	8.2400e-003	0.0000	46.2835	46.2835	2.7500e-003	0.0000	46.3523

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20.00	20.00	20.00	77,269	77,269
Total	20.00	20.00	20.00	77,269	77,269

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.510644	0.028911	0.156693	0.100614	0.015429	0.004164	0.015358	0.155771	0.002390	0.001975	0.005996	0.001496	0.000559

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	105.2340	105.2340	9.2800e-003	1.9200e-003	106.0383
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	105.2340	105.2340	9.2800e-003	1.9200e-003	106.0383
NaturalGas Mitigated	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	89.0962	89.0962	1.7100e-003	1.6300e-003	89.6257
NaturalGas Unmitigated	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	89.0962	89.0962	1.7100e-003	1.6300e-003	89.6257

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					
General Light Industry	1.6696e+006	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	89.0962	89.0962	1.7100e-003	1.6300e-003	89.6257
Total		**9.0000e-003**	**0.0818**	**0.0688**	**4.9000e-004**		**6.2200e-003**	**6.2200e-003**		**6.2200e-003**	**6.2200e-003**	**0.0000**	**89.0962**	**89.0962**	**1.7100e-003**	**1.6300e-003**	**89.6257**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.6696e+006	9.0000e-003	0.0818	0.0688	4.9000e-004		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	89.0962	89.0962	1.7100e-003	1.6300e-003	89.6257
Total		**9.0000e-003**	**0.0818**	**0.0688**	**4.9000e-004**		**6.2200e-003**	**6.2200e-003**		**6.2200e-003**	**6.2200e-003**	**0.0000**	**89.0962**	**89.0962**	**1.7100e-003**	**1.6300e-003**	**89.6257**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	705600	105.2340	9.2800e-003	1.9200e-003	106.0383
Total		**105.2340**	**9.2800e-003**	**1.9200e-003**	**106.0383**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	705600	105.2340	9.2800e-003	1.9200e-003	106.0383
Total		**105.2340**	**9.2800e-003**	**1.9200e-003**	**106.0383**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3681	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003
Unmitigated	0.3681	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003

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	0.0556					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003
Total	**0.3681**	**1.0000e-005**	**7.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4300e-003**	**1.4300e-003**	**0.0000**	**0.0000**	**1.5200e-003**

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	0.0556					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4300e-003	1.4300e-003	0.0000	0.0000	1.5200e-003
Total	**0.3681**	**1.0000e-005**	**7.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4300e-003**	**1.4300e-003**	**0.0000**	**0.0000**	**1.5200e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	20.7988	0.6041	0.0145	40.2251
Unmitigated	20.7988	0.6041	0.0145	40.2251

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	18.5 / 0	20.7988	0.6041	0.0145	40.2251
Total		**20.7988**	**0.6041**	**0.0145**	**40.2251**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	18.5 / 0	20.7988	0.6041	0.0145	40.2251
Total		**20.7988**	**0.6041**	**0.0145**	**40.2251**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.0299	0.1200	0.0000	5.0290
Unmitigated	2.0299	0.1200	0.0000	5.0290

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	10	2.0299	0.1200	0.0000	5.0290
Total		**2.0299**	**0.1200**	**0.0000**	**5.0290**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	10	2.0299	0.1200	0.0000	5.0290
Total		**2.0299**	**0.1200**	**0.0000**	**5.0290**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	0.01	91	50	0.73	Diesel

Boilers

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

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (50 - 75 HP)	3.7300e-003	0.0122	0.0136	2.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.7326	1.7326	2.4000e-004	0.0000	1.7387
Total	**3.7300e-003**	**0.0122**	**0.0136**	**2.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.7326**	**1.7326**	**2.4000e-004**	**0.0000**	**1.7387**

11.0 Vegetation

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APPENDIX B

BIOLOGICAL RESOURCES EVALUATION

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CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 20, 2019

TO: Joseph Angulo, P.G., City of Merced Public Works

FROM: Anna Van Zuuk, Biologist/Botanist

SUBJECT: Biological Resources Evaluation for the Merced Municipal Well Site 22 Project, Merced County, California

LSA has prepared this memorandum detailing the results of a biological survey conducted for the proposed Merced Municipal Well Site 22 Project (Project) in Merced County, California (Figure 1). The Project involves the construction of a new municipal well on a City of Merced (City)-owned parcel located at 3987 Hatch Road. The Biological Study Area (BSA) for the Project, totaling approximately 4 acres, includes the City-owned parcel, Assessor's Parcel Number (APN) 060-560-002 (Figure 2).

The purpose of the biological survey was to support the City's environmental review requirements under the California Environmental Quality Act (CEQA) by identifying any special-status species and their habitats, wetlands and other regulated waters, and other potential biological resource constraints to property development. This memorandum includes a description of the Project, an explanation of the methods used to conduct the survey, a description of the Project setting, results of the survey including a list of all plant and wildlife species observed, and recommendations, as necessary, to address the requirements of CEQA.

PROJECT DESCRIPTION

The City proposes within its service area the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the Project is to provide water supply reliability in accordance with the California State Water Resources Control Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The Project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Plan and the recommendations contained in technical reports by the City's engineering consultant. The Project would maintain the surety of the City's water supply in the event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

Municipal Well Site 22

The proposed well site is located within a 4.01-acre parcel, approximately 1.09 acres of which is dedicated as right-of-way for the future extension of East Cardella Road. Well 22, a water storage tank, and associated infrastructure would be located within the parcel in an area approximately 1.84 acres in size that would be set back from Hatch Road by approximately 185 feet (Figure 3).

Although the City has not prepared final design plans for the Project, Well 22 would be approximately 600 feet deep and designed to yield 2,500 gallons per minute.

Associated infrastructure that would be constructed as part of the Project would include an approximately 10,000 square-foot concrete masonry unit (CMU) block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, and booster pump station piping. The building would also include electrical, a supervisory control and data acquisition (SCADA) computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment, and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the Project site. The Project would also include construction of a fuel tank, transformer and pad, and drain box.

The Project would include a 3-million-gallon water storage tank, constructed of either welded steel or prestressed concrete, and a booster pump station. The proposed water storage tank would be approximately 35 feet tall, and a paved 20-foot-wide access area would border the circumference of the tank.

The booster pump station would have vertical turbine suction barrel pumps located inside a CMU block wall or pre-engineered metal building. Water from the pump station would discharge into an above-ground header pipe located within the building. Associated on-site infrastructure would include a drain line with a valve and blind flange.

Site improvements include construction of an 8-foot exterior block wall, access gates, security monitors, 20-foot LED lighting fixtures, a 50-foot antenna tower, vehicle parking, and frontage landscaping.

All unused portions of the 1.84-acre well site would be covered with asphalt. As a result, construction of the Project would result in an increase of approximately 1.84 acres (or approximately 80,000 square feet) of new impervious surface within of the 4.01-acre Project site. Stormwater retention/treatment features would include on-site catch basins, a storm drainage collection system, and a retention basin sized to retain all stormwater runoff for the Well 22 site. Access to the Project site would be provided by a new 20-foot-wide driveway via the future extension of East Cardella Road.

The Well 22 Project would be constructed in three phases, as described below.

Phase 1

Phase 1 would include the completion of a temporary test well, which would consist of: preparation of the well site area and grading to create a temporary bermed area to contain and percolate well

development water; well drilling, test pumping, and water sampling for laboratory analysis. Overall construction of the Well 22 facilities under Phase 1 would occur over approximately 90 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 6 to 10 calendar days out of the 90 total work days.

Phase 2

Phase 2 would include the completion of the new municipal well. Construction activities would initiate with installing and sealing a 34-inch conductor casing in a 48-inch diameter hole to an approximate depth of approximately 50 feet. This casing string would provide the primary sanitary protection of the well. The production borehole would be advanced though the conductor casing, and would be drilled at a diameter of 28-inches to a depth of approximately 640 feet. A casing assembly, consisting of an 18-inch blank well casing and well screen, would be installed in the production borehole. An annular seal of cement grout would be installed to a depth of 200 feet or more. A gravel envelope from the annular seal to the borehole depth of 640 feet would be installed around the well screen to retain the unconsolidated aquifer materials (sand and gravel) and allow sand-free production from the well. An engine-driven deep well turbine test pump would be installed for final well development and testing. As with Phase 1 above, well development water would be retained in a temporary bermed area. Overall construction of the Well 22 facilities under Phase 2 would occur over approximately 120 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

Phase 3

Phase 3 would include the completion of the new pump station, which would consist of: installation of a new concrete masonry pump building, asphalt concrete paving, storm water basin, submersible well pump, station piping, water storage tank, backup diesel generator, fuel tank, system controls, electrical transformer, motor control panel, concrete masonry walls, security gates, yard lighting, and landscaping. The construction of Phase 3 would take approximately 18 months.

The total time for completing all phases is estimated at 36 months, when allowing for the interim design period as well as contract bidding and start up for each construction phase. All work would be performed between the hours of 7 a.m. and 7 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day, as noted above.

Construction of the Project is anticipated to start in April 2021 and end in April 2024.

METHODS

Prior to conducting the field survey, LSA compiled a list of sensitive plant and wildlife species potentially occurring within the BSA to evaluate potential impacts resulting from Project construction. Sources used to compile this list include the California Native Plant Society (CNPS) Online Inventory (2019), the California Natural Diversity Database (CNDDB) referencing the Merced U.S. Geological Survey 7.5 minute quadrangle and eight surrounding quadrangles, and the United States Fish and Wildlife Service (USFWS) Information, Planning, and Consultation (IPaC) Resource List. These databases contain records of special-status species that have been recorded in the general vicinity of the Project and provide an indication of what species may occur within the BSA.

LSA biologist Anna Van Zuuk conducted a general biological survey on September 26, 2019 noting plant communities and wildlife species within the BSA. Ms. Van Zuuk also assessed the potential for the BSA to support special-status species and sensitive habitats.

Vegetation communities within the BSA were classified based on descriptions in "A Manual of California Vegetation – Second Edition" by Sawyer, Keeler-Wolf, and Evans (2008), as appropriate. Names of plant species are consistent with The Jepson Manual: Vascular Plants of California, Second Edition (Baldwin, B.G., et. Al., editors 2012) and the Jepson Online Interchange for California Floristics (Jepson eFlora 2018). Plant communities were mapped using a GPS unit with submeter accuracy. All data was entered into a GIS database to calculate the extent of the communities within the BSA and to produce the final mapping. Final mapping was completed using color aerial photos, dated August 2018, at a scale of 1 inch = 100 feet.

ENVIRONMENTAL SETTING

The BSA is located in the Central Valley, which is characterized by large flat areas of agricultural farmland, within the Sphere-of-Influence (SOI) of the City of Merced in Merced County. The BSA is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to 3 acres in size. Single-family homes are located directly south and northeast of the Project site. The adjacent residential uses rely on residential groundwater wells and septic tanks. Land to the west of the Project site is used for agricultural production, and land to the north of the Project site is not developed and currently used as grazing land. Topography is flat with some shallow undulation, located at an elevation of approximately 184 to 197 feet above mean sea level.

The BSA itself is composed entirely of ruderal areas. Representative photos are provided as an attachment to this memorandum. An unnamed tributary to Cottonwood Creek and the Yosemite Lateral, located approximately 0.15 mile west and 0.16 mile east, respectively, are the nearest aquatic features.

Plant Communities / Land Uses

Ruderal

The entire BSA consists of ruderal areas, totaling 4.01 acres. Ruderal areas within the BSA are heavily influenced by human activities and are dominated by a variety of pioneering species including Italian rye grass (*Festuca perennis*), prickly lettuce (*Lactuca serriola*), charlock mustard (*Sinapis arvensis*), pigweed amaranth (*Amaranthus albus*), prostrate amaranth (*Amaranthus blitoides*), lamb's quarters (*Chenopodium album*), and silver leaved horsenettle (*Solanum elaeagnifolium*), among others. A full species list is included as an attachment to this memorandum.

It is worth noting that the BSA previously contained a residential structure which was demolished between 2009 and 2010. As a result of this historic land use, the BSA also contains relic landscape plantings in the form of existing trees and shrubs which make up the overstory component of the site. Tree species observed within the BSA include white mulberry (*Morus alba*), black locust (*Robinia pseudoacacia*), red gum (*Eucalyptus camaldulensis*), edible fig (*Ficus carica*), silver dollar gum (*Eucalyptus polyanthemos*), and deodar cedar (*Cedrus deodara*).

RESULTS

Based on the results of the biological survey, information provided in the database queries, and an evaluation of aerial imagery, sensitive biological resources potentially occurring in the BSA include burrowing owl (*Athena cunicularia*), Swainson's hawk (*Buteo swainsoni*), San Joaquin kit fox (*Vulpes macrotis mutica*), and nesting birds. The BSA does not contain any sensitive habitats, potentially jurisdictional aquatic features, or appropriate habitat for special-status plant species. No special-status plants were observed during the field survey.

Burrowing Owl

Burrowing owl is designated by the California Department of Fish and Wildlife as a Species of Special Concern. This species inhabits areas with low vegetation in agricultural fields, grasslands, and desert communities and also occurs in urban and suburban areas subject to regular human disturbance. Burrowing owls require fossorial mammal burrows, typically those created by California ground squirrels (*Otospermophilus beecheyi*), for escape cover and nesting. However, piles of rock, concrete debris, and other materials are also used in lieu of burrows. The breeding season occurs from February 1 to August 31, and peaks between late April and July in most years.

Although no burrowing owls or sign were observed during the field survey, numerous ground squirrel burrows occur in the northern portion of the BSA underneath existing trees, primarily black locust and white mulberry. These burrows provide suitable nesting habitat for this species, and adjacent grazing fields north of the BSA provide ideal foraging habitat. Ruderal areas within the BSA would also provide moderately suitable foraging habitat for burrowing owls. The nearest CNDDB occurrence is located approximately 1.3 miles northeast of the BSA across from the University of California, Merced campus. Therefore, there is high potential for burrowing owls to occur within the BSA.

Swainson's Hawk

Swainson's hawk is designated as a threatened species under the California Endangered Species Act (CESA). Swainson's hawks are open-country birds that nest in the Central Valley of California. Nests are typically found in scattered trees or along riparian corridors adjacent to annual grasslands, pastures, alfalfa, and other crops that provide foraging habitat. Agricultural areas are most often used by foraging Swainson's hawks just after harvest or irrigation when prey populations become exposed or brought to the surface. Swainson's hawks forage primarily on small rodents and reptiles during the breeding season (March to July), and on insects during the non-breeding period. Swainson's hawks typically migrate to and overwinter in South America between September and February, returning to North America in the spring to nest.

Two red tailed hawks (*Buteo jamaicensis*) were observed foraging over grazing lands south of the BSA during the field survey, however no Swainson's hawks were observed. No suitable nest trees are located within the BSA, however suitable nest trees occur east of the BSA on the parcel located on the east side of Hatch Road, consisting primarily of eucalyptus trees. No large stick nests were observed in any of these trees during a window survey of the area. Grazing lands and ruderal habitats within and adjacent to the BSA provide suitable foraging habitat for this species. The nearest extant CNDDB occurrence of Swainson's hawk is located approximately 2.66 miles southeast of the BSA. Although there is potential for Swainson's hawks to nest adjacent to the BSA, the location of suitable nest trees on residential lots will likely deter nesting due to human activity. Because Swainson's hawks are unlikely to nest in or adjacent to the BSA, protective measures are not recommended for this species.

San Joaquin Kit Fox

San Joaquin kit fox (SJKF) is listed as an endangered species under the federal Endangered Species Act and the CESA. SJKF has declined throughout its range primarily due to habitat loss, but other possible factors include predator and pest control programs and competition, primarily with coyotes. SJKF inhabits valley and foothill grasslands, sparsely vegetated shrubby habitats, and some agricultural and urban areas. Habitats most frequently used by the species are comprised mostly of grassland and saltbush scrub. SJKF use complex dens for shelter and protection, most of which are located in flat terrain or on the lower slopes of hills. Common locations for dens include washes, drainages, and roadside berms. Kit foxes are reputed to be poor diggers and are usually found in areas with loose-textured, friable soils. Some studies have suggested that where hardpan layers predominate, kit foxes create dens by enlarging California ground squirrel or American badger (*Taxidea taxus*) burrows. They also commonly den in man-made structures such as small-diameter culverts. Kit fox are quite tolerant of human disturbances and will, to an extent, use oil fields and cultivated agricultural lands. A diet of small rodents such as kangaroo rats and California ground squirrels is common for this species.

No SJKF were observed during the field survey, however potentially suitable denning habitat for this species occurs within the BSA underneath a black locust tree. Several burrows at the base of the tree were large enough to potentially accommodate SJKF, and adjacent grazing fields provide suitable foraging habitat. The nearest CNDDB occurrence is located approximately 3.6 miles east of the BSA in an undeveloped area adjacent to agricultural operations. Although potentially suitable

denning and foraging habitat is present within the BSA, it is unlikely that SJKF would disperse through the area given the nature of surrounding land uses (agricultural, developed, rural residential) and the proximity of more suitable habitat for this species. Furthermore, no Project impacts are proposed to the northern portion of the BSA. Therefore, based on the proximity of more suitable SJKF habitat in the vicinity, the low number of nearby occurrences, and the generally developed nature of habitat within and surrounding the BSA, there is low potential for SJKF to occur within the BSA. Protective measures are not recommended for this species.

Nesting Birds

The BSA provides suitable nesting habitat for a number of bird species protected under Section 3503 of the California Fish and Game Code; however, the survey was conducted outside of the nesting bird season. The following bird species were observed and may nest within the BSA: American kestrel (*Falco sparverius*), song sparrow (*Melospiza melodia*), northern mockingbird (*Mimus polyglottos*), western bluebird (*Sialia mexicana*), and mourning dove (*Zenaida macroura*). Since the Project proposes to remove two trees as a result of project construction, migratory bird species may be impacted in the event they are nesting in the BSA when construction begins. Therefore, the Project has the potential to impact nesting bird species protected under Section 3503.

RECOMMENDATIONS

Based on the results of the field surveys, protective measures are not recommended for Swainson's hawks or SJKF. The following general avoidance and minimization measures are recommended to mitigate potential impacts to burrowing owls and all other nesting birds:

1. Tree removal activities should be conducted outside the nesting bird season (February 1 – August 31).

2. If work begins between February 1 and August 31, a qualified biologist should conduct a preconstruction survey for burrowing owl and other nesting birds in the BSA no more than 10 days prior to the start of construction. Pre-construction surveys for burrowing owl should be conducted in accordance with the California Department of Fish and Wildlife's (CDFW) 2012 Staff Report on Burrowing Owl Mitigation.

3. If no nesting activity is observed, work may proceed as planned. If any active bird nests are discovered within the BSA, a qualified biologist should evaluate the potential for the work activities to disturb typical nesting behavior of the birds and establish protective buffers, if necessary, based on this evaluation.

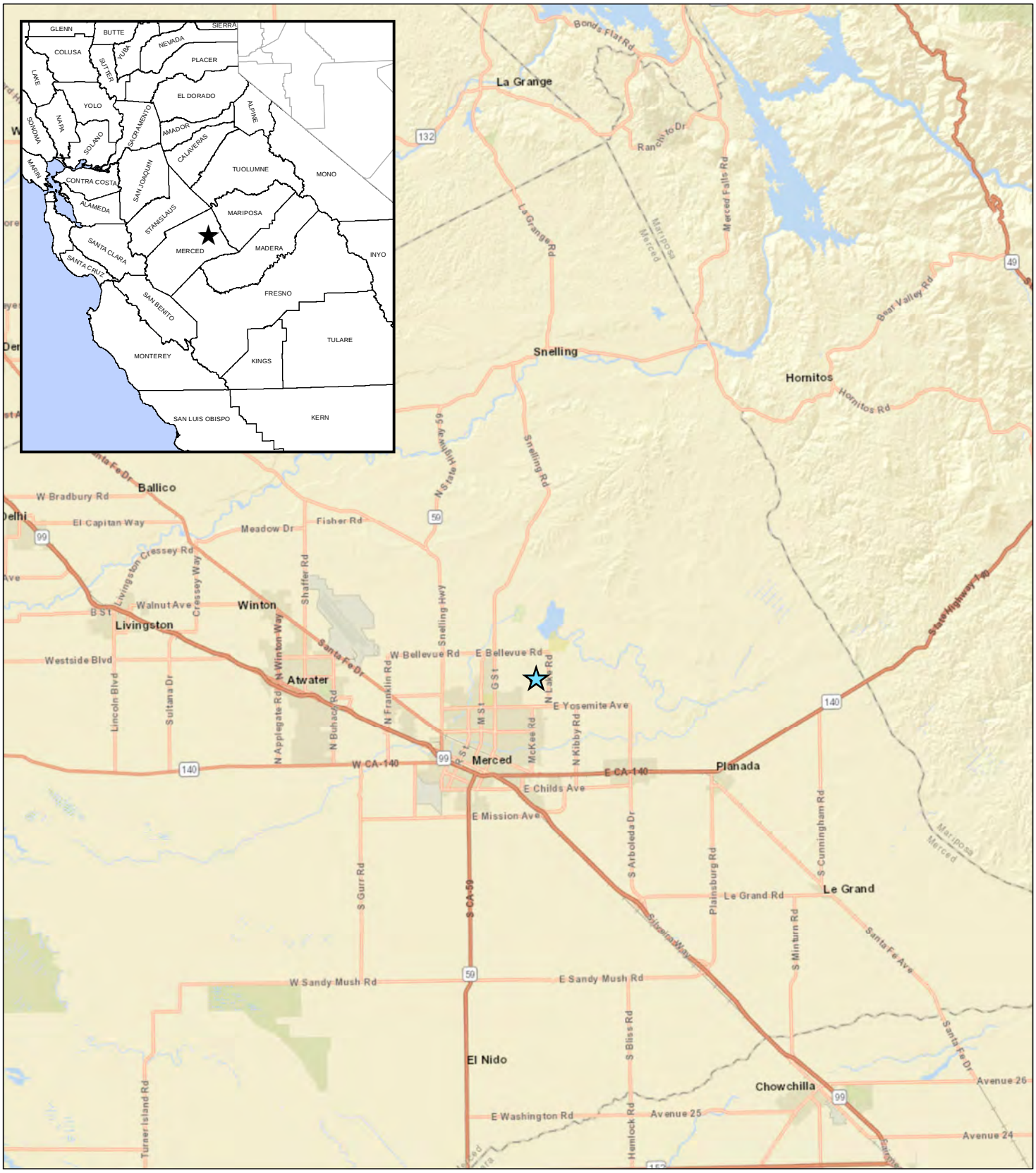
4. If any active nests of special-status bird species (such as burrowing owl) are discovered within or less than 500 feet of the BSA, a minimum 500 foot buffer should be established. If any work is proposed within this buffer, CDFW should be notified, and should have the authority to reassess protective buffers and/or establish other avoidance and minimization measures.

5. Disturbance of active nests should be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged, or the nest has failed. If work is allowed to proceed, a qualified biologist should be on-site during the start of construction activities to

monitor nesting activity. The biologist should have the authority to stop work if it is determined that the Project is adversely affecting nesting activities.

Attachments:

Figure1 – Regional Location
Figure 2 – Project Vicinity on Aerial Base
Figure 3 – Conceptual Site Plan
Information, Planning, and Consultation (IPaC) Resource List
California Natural Diversity Data Base (CNDDB) Species List
California Native Plant Society (CNPS) Plant List
List of Observed Species
Representative Photos



LSA

LEGEND

Project Location

FIGURE 1

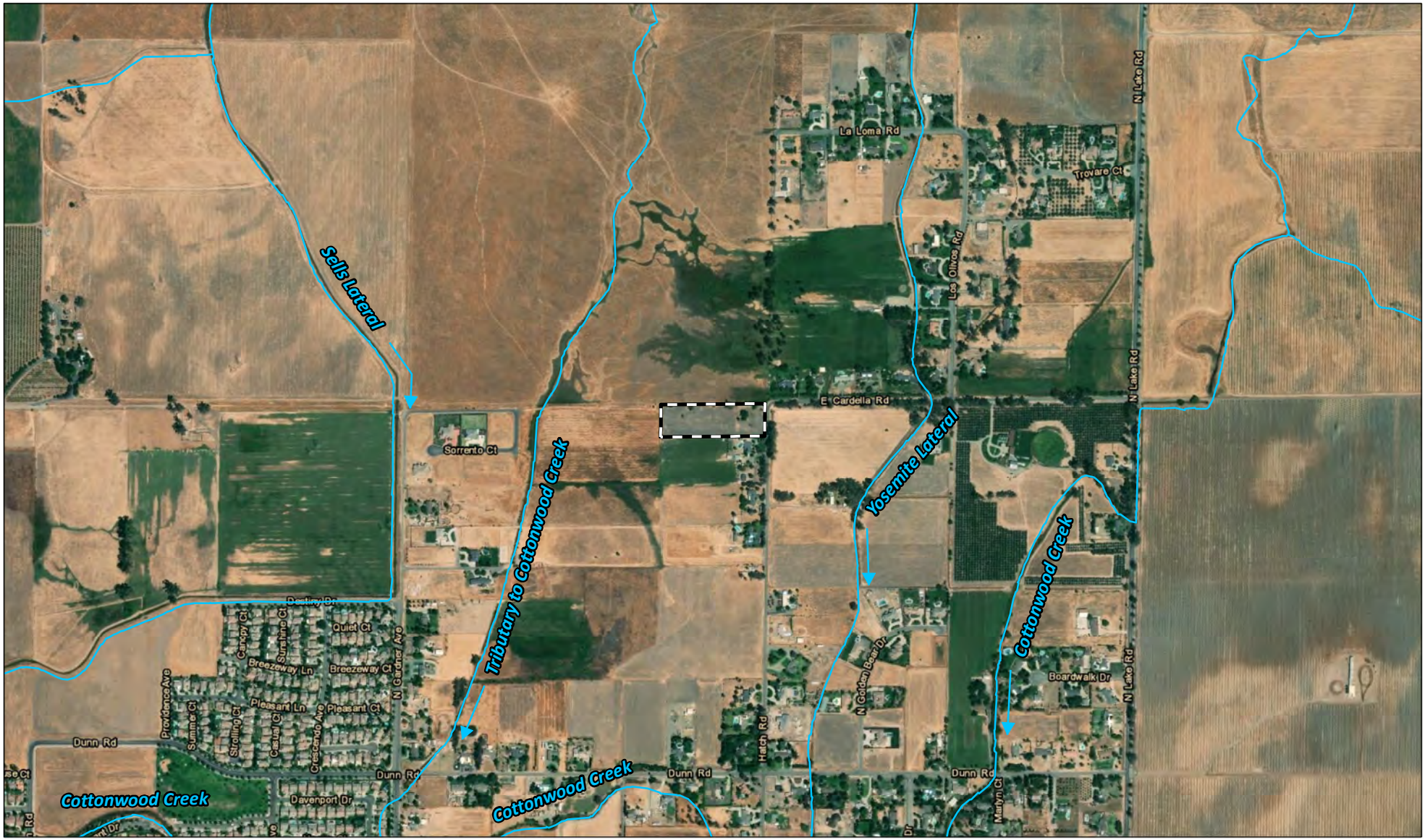
Merced Municipal Well Site 22
County of Merced, California
LSA Project No. MED1901

Regional Location

0 2.5 5
Miles

SOURCE: ESRI World Street Map (09/2019)

I:\MED1901\GIS\Reports\Bio Constraints Memo\Fig1_Regional_loc.mxd (10/1/2019)



LSA

LEGEND

Biological Study Area - (4.01 ac)

Aquatic Features

0 500 1000

FEET

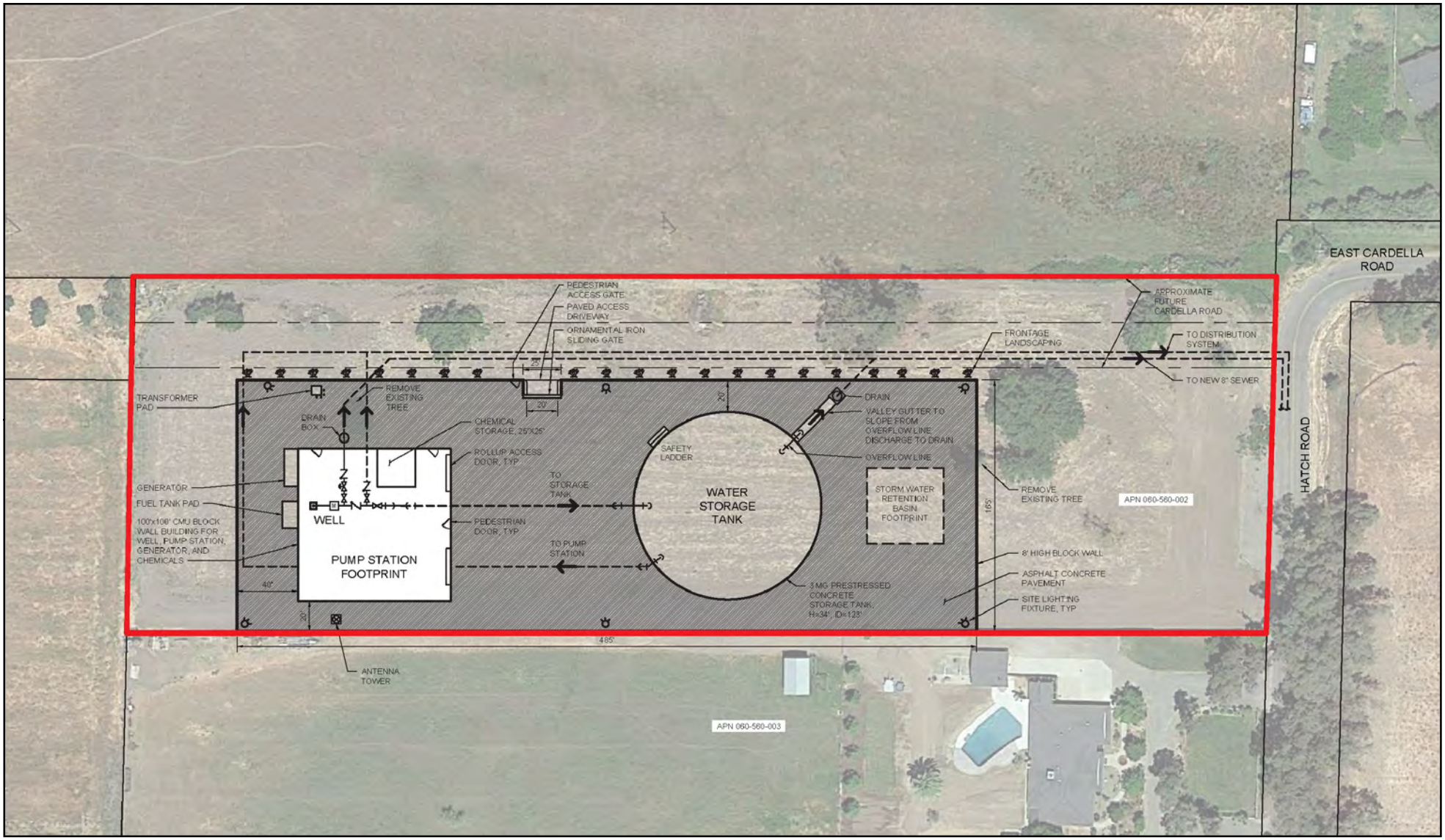
SOURCE: DigitalGlobe Aerial Imagery (08/2018)

I:\MED1901\GIS\Reports\Bio Constraints Memo\Fig2_Prj_vicin_aerial.mxd (10/2/2019)

FIGURE 2

Merced Municipal Well Site 22
County of Merced, California
LSA Project No. MED1901

Project Vicinity on Aerial Base



LSA

LEGEND

Biological Study Area - (4.01 ac)

FIGURE 3

N

0 60 120

FEET

SOURCE: MKN (2019)

I:\MED1901\GIS\Reports\Bio Constraints Memo\Fig3_Conceptual _Site_Plan.mxd (10/2/2019)

Merced Municipal Well Site 22
County of Merced, California
LSA Project No. MED1901

Conceptual Site Plan

United States Department of the Interior

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

In Reply Refer To: September 24, 2019
Consultation Code: 08ESMF00-2019-SLI-3143
Event Code: 08ESMF00-2019-E-10007
Project Name: Merced Well 22

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

To Whom It May Concern:

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

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

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

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 08ESMF00-2019-SLI-3143

Event Code: 08ESMF00-2019-E-10007

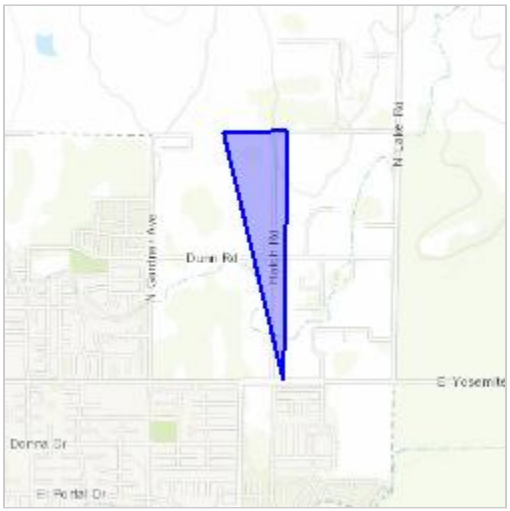
Project Name: Merced Well 22

Project Type: DEVELOPMENT

Project Description: LSA project number MED1901

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.339489132905925N120.44210932446131W



Counties: Merced, CA

Endangered Species Act Species

There is a total of 14 threatened, endangered, or candidate species on this species list.

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

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

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

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

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2891
Species survey guidelines:
https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf

California Tiger Salamander *Ambystoma californiense*	Threatened

Population: U.S.A. (Central CA DPS)
There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2076

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7850
Habitat assessment guidelines:
https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio*	Endangered

There is **final** critical habitat for this species. Your location overlaps the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp *Branchinecta lynchi*	Threatened

There is **final** critical habitat for this species. Your location overlaps the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp *Lepidurus packardi*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2246

Flowering Plants

NAME	STATUS
Colusa Grass *Neostapfia colusana* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5690	Threatened
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8095	Threatened
Hairy Orcutt Grass *Orcuttia pilosa* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2262	Endangered
San Joaquin Orcutt Grass *Orcuttia inaequalis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5506	Threatened

Critical habitats

There are 6 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Colusa Grass *Neostapfia colusana* https://ecos.fws.gov/ecp/species/5690#crithab	Final
Conservancy Fairy Shrimp *Branchinecta conservatio* https://ecos.fws.gov/ecp/species/8246#crithab	Final
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* https://ecos.fws.gov/ecp/species/8095#crithab	Final
Greene's Tuctoria *Tuctoria greenei* For information on why this critical habitat appears for your project, even though Greene's Tuctoria is not on the list of potentially affected species at this location, contact the local field office. https://ecos.fws.gov/ecp/species/1573#crithab	Final
San Joaquin Orcutt Grass *Orcuttia inaequalis* https://ecos.fws.gov/ecp/species/5506#crithab	Final
Vernal Pool Fairy Shrimp *Branchinecta lynchi* https://ecos.fws.gov/ecp/species/498#crithab	Final

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Merced (3712034) OR Winton (3712045) OR Yosemite Lake (3712044) OR Haystack Mtn. (3712043) OR Sandy Mush (3712025) OR El Nido (3712024) OR Plainsburg (3712023) OR Planada (3712033) OR Atwater (3712035))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Agrostis hendersonii Henderson's bent grass	PMPOA040K0	None	None	G2Q	S2	3.2
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Atriplex persistens vernal pool smallscale	PDCHE042P0	None	None	G2	S2	1B.2
Atriplex subtilis subtle orache	PDCHE042T0	None	None	G1	S1	1B.2
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G2	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Calycadenia hooveri Hoover's calycadenia	PDAST1P040	None	None	G2	S2	1B.3
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Clarkia rostrata beaked clarkia	PDONA050Y0	None	None	G2G3	S2S3	1B.3
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Dipodomys heermanni dixoni Merced kangaroo rat	AMAFD03062	None	None	G3G4T2T3	S2S3	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Gambelia sila blunt-nosed leopard lizard	ARACF07010	Endangered	Endangered	G1	S1	FP
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Lagophylla dichotoma forked hare-leaf	PDAST5J070	None	None	G2	S2	1B.1
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Navarretia myersii ssp. myersii pincushion navarretia	PDPLM0C0X1	None	None	G2T2	S2	1B.1
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Neostapfia colusana Colusa grass	PMPOA4C010	Threatened	Endangered	G1	S1	1B.1
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Orcuttia inaequalis San Joaquin Valley Orcutt grass	PMPOA4G060	Threatened	Endangered	G1	S1	1B.1
Orcuttia pilosa hairy Orcutt grass	PMPOA4G040	Endangered	Endangered	G1	S1	1B.1
Perognathus inornatus San Joaquin Pocket Mouse	AMAFD01060	None	None	G2G3	S2S3	
Phacelia ciliata var. opaca Merced phacelia	PDHYD0C0S2	None	None	G5TH	SH	3.2
Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G2	S2	1B.1
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Sidalcea keckii Keck's checkerbloom	PDMAL110D0	Endangered	None	G2	S2	1B.1
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 58

CNPS California Native Plant Society

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

32 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712045, 3712044, 3712043, 3712035, 3712034, 3712033, 3712025 3712024 and 3712023;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Agrostis hendersonii	Henderson's bent grass	Poaceae	annual herb	Apr-Jun	3.2	S2	G2Q
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun,Aug,Sep,Oct	1B.2	S2	G2
Atriplex subtilis	subtle orache	Chenopodiaceae	annual herb	Jun,Aug,Sep(Oct)	1B.2	S1	G1
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3	S3	G5
Calycadenia hooveri	Hoover's calycadenia	Asteraceae	annual herb	Jul-Sep	1B.3	S2	G2
Castilleja campestris var. succulenta	succulent owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	(Mar)Apr-May	1B.2	S2S3	G4? T2T3
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Clarkia rostrata	beaked clarkia	Onagraceae	annual herb	Apr-May	1B.3	S2S3	G2G3
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	4.2	S4	G4
Delphinium hansenii ssp. ewanianum	Ewan's larkspur	Ranunculaceae	perennial herb	Mar-May	4.2	S3	G4T3
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2

Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2	S2	G2
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
Lagophylla dichotoma	forked hare-leaf	Asteraceae	annual herb	Apr-May	1B.1	S2	G2
Navarretia myersii ssp. myersii	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	1B.1	S2	G2T2
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	annual herb	Apr-Sep	1B.1	S1	G1
Orcuttia pilosa	hairy Orcutt grass	Poaceae	annual herb	May-Sep	1B.1	S1	G1
Phacelia ciliata var. opaca	Merced phacelia	Hydrophyllaceae	annual herb	Feb-May	3.2	SH	G5TH
Pseudobahia bahiifolia	Hartweg's golden sunburst	Asteraceae	annual herb	Mar-Apr	1B.1	S2	G2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Sidalcea keckii	Keck's checkerbloom	Malvaceae	annual herb	Apr-May(Jun)	1B.1	S2	G2
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	1B.1	S1	G1

Suggested Citation

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CalPhotos

Questions and Comments
rareplants@cnps.org

Merced Well 22 Development Project - MED1901 Plant Species Observed				
Scientific Name	**Common Name**	**Family**	**Invasiveness**	**Notes**
Amaranthus albus	Pigweed amaranth	Amaranthaceae	Not-rated	
Amaranthus blitoides	Prostrate amaranth	Amaranthaceae	Native	
Amaranthus retroflexus	Green amaranth	Amaranthaceae	Not-rated	
Asclepias fascicularis	Narrow leaf milkweed	Apocynaceae	Native	
Avena barbata	Slim oat	Poaceae	Moderate	
Bromus diandrus	Ripgut brome	Poaceae	Moderate	
Capsella bursa-pastoris	Shepherd's purse	Brassicaceae	Not-rated	
Cedrus deodara	Deodar cedar	Pinaceae	Not-rated	
Centaurea solstitialis	Yellow star thistle	Asteraceae	High	
Chenopodium album	Lamb's quarters	Chenopodiaceae	Not-rated	
Cichorium intybus	Chicory	Asteraceae	Not-rated	
Cirsium vulgare	Bull thistle	Asteraceae	Moderate	
Citrullus lanatus	Watermelon	Cucurbitaceae	Not-rated	
Convolvulus arvensis	Field bindweed	Convolvulaceae	Not-rated	
Cynodon dactylon	Bermuda grass	Poaceae	Moderate	
Epilobium brachycarpum	Panicled willow herb	Onagraceae	Native	
Erigeron bonariensis	Flax-leaved horseweed	Asteraceae	Not-rated	
Eucalyptus camaldulensis	Red gum	Myrtaceae	Limited	
Eucalyptus polyanthemos	Silver dollar gum	Myrtaceae	Not-rated	
Festuca perennis	Italian rye grass	Poaceae	Moderate	Dominant
Ficus carica	Edible fig	Moraceae	Moderate	
Hedera helix	English ivy	Araliaceae	High	
Hordeum murinum	Foxtail barley	Poaceae	Moderate	
Lactuca serriola	Prickly lettuce	Asteraceae	Not-rated	Dominant
Lagerstroemia indica	Crapemyrtle	Lythraceae	Not-rated	
Ligustrum lucidum	Glossy privet	Oleaceae	Limited	
Malva parviflora	Cheeseweed	Malvaceae	Not-rated	
Marrubium vulgare	White horehound	Lamiaceae	Limited	
Morus alba	White mulberry	Moraceae	Not-rated	
Olea europaea	Olive	Oleaceae	Limited	
Paspalum dilatatum	Dallis grass	Poaceae	Not-rated	
Phalaris minor	Mediterranean canarygrass	Poaceae	Not-rated	
Polygonum aviculare	Prostrate knotweed	Polygonaceae	Not-rated	
Pyracantha angustifolia	Narrowleaf firethorn	Rosaceae	Limited	
Robinia pseudoacacia	Black locust	Fabaceae	Limited	
Rubus armeniacus	Himalayan blackberry	Rosaceae	High	
Rumex crispus	Curly dock	Polygonaceae	Limited	
Silybum marianum	Milk thistle	Asteraceae	Limited	
Sinapis arvensis	Charlock mustard	Brassicaceae	Limited	Dominant
Solanum elaeagnifolium	Silver leaved horsenettle	Solanaceae	Not-rated	
Sonchus sp.	Sow thistle	Asteraceae	Not-rated	
Sorghum halepense	Johnsongrass	Poaceae	Not-rated	
Spergularia sp.	Sand spurry	Caryophyllaceae		
Xanthium spinosum	Spiny cocklebur	Asteraceae	Not-rated	

Merced Well 22 Development Project - MED1901 Wildlife Species Observed				
Scientific Name	**Common Name**	**Family**	**Order**	**Notes**
Buteo jamaicensis	Red-tailed hawk	Accipitridae	Falconiformes	
Canis latrans	Coyote	Canidae	Carnivora	Scat
Cathartes aura	Turkey vulture	Cathartidae	Ciconiiformes	
Falco sparverius	American kestrel	Falconidae	Falconiformes	
Felis catus	Domestic cat	Felidae	Carnivora	
Melospiza melodia	Song sparrow	Emberizidae	Passeriformes	
Mimus polyglottos	Northern mockingbird	Mimidae	Passeriformes	
Otospermophilus beecheyi	California ground squirrel	Sciuridae	Rodentia	Numerous burrows
Sialia mexicana	Western bluebird	Turdidae	Passeriformes	
Zenaida macroura	Mourning dove	Columbidae	Columbiformes	

Fire break along southern boundary of BSA, looking west.

Fire break along southern boundary of BSA, looking east.

Habitat conditions in eastern portion of BSA, looking northeast.

Blackberry thicket along northern boundary of BSA, looking north. May provide suitable nesting habitat for migratory birds.

LSA

Merced Municipal Well 22
County of Merced, California
LSA Project No. MED1901

Representative Photos

Source: LSA (09/2019)

Habitat conditions in the western portion of the BSA, looking east.

Grazing lands north of the BSA, looking northwest.

Example of burrow complex underneath black locust trees.

Large CA ground squirrel burrow of sufficient size to support SJKF.

LSA

Merced Municipal Well 22
County of Merced, California
LSA Project No. MED1901

Representative Photos

Source: LSA (09/2019)

APPENDIX C

NOISE ANALYSIS

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CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 20, 2019

TO: Joseph D. Angulo, P.G., Environmental Project Manager

FROM: Amy Fischer, Principal
Cara Carlucci, Planner

SUBJECT: Noise Analysis for the proposed Municipal Well Site #22

This Noise Analysis Memorandum for the proposed Municipal Well Site #22 Project (project) in the County of Merced (County) has been prepared to satisfy the County's requirement for a project-specific noise impact analysis by examining the impacts of the proposed project and identifying measures to reduce or eliminate significant impacts, where appropriate.

PROJECT DESCRIPTION

The project site is located at 3987 Hatch Road in Merced County, on the southwest corner of the intersection of East Cardella Road and Hatch Road. The proposed well would be located on Assessor's Parcel Number (APN) 060-560-002. Figure 1 shows the project site's regional and local context. The project site is located on a rectangular parcel that is 4.01 acres in size. The proposed well site is currently vacant and undeveloped, with ruderal vegetation located throughout.

The project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to 3 acres in size. Figure 2 depicts an aerial photograph of the project site and identifies surrounding land uses. As shown in Figure 2, single-family homes are located directly south and northeast of the proposed well site. Land to the west of the project site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use.

The project includes the construction and operation of a new municipal water supply well (Well 22) and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. The purpose of the project is to provide water supply reliability in accordance with the California State Water Resources Control Board, Division of Drinking Water (DDW) Waterworks Standards following the removal of service of Well 7B due to elevated nitrate concentrations.

The project would be consistent with, and would implement elements of, the City's adopted 5-year Capital Improvement Plan and the recommendations contained in technical reports by the City's engineering consultant. The project would maintain the surety of the City's water supply in the

event of a water supply emergency. The proposed Well 22 site would meet well setback requirements under DDW and City regulations.

Municipal Well Site 22

The proposed well site is located within a 4.01-acre parcel, approximately 1.09 acres of which is dedicated as ROW for the future extension of East Cardella Road. Well 22, the water storage tank, and associated infrastructure would be located within the parcel in an area approximately 1.84 acres in size that would be set back from Hatch Road by approximately 185 feet.

Although the City has not prepared final design plans for the project, Well 22 would be approximately 600 feet deep and designed to yield 2,500 gallons per minute.

Associated infrastructure that would be constructed as part of the project would include an approximately 10,000 square-foot concrete masonry unit (CMU) block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, booster pump station piping. The building would also include electrical, a supervisory control and data acquisition (SCADA) computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the project site.

The project would also include construction of a fuel tank, transformer and pad, and drain box.

The project would include a three-million-gallon water storage tank, constructed of either welded steel or prestressed concrete, and a booster pump station. The proposed water storage tank would be approximately 35 feet tall, and a paved 20-foot-wide access area would border the circumference of the tank.

The booster pump station would have vertical turbine suction barrel pumps located inside a CMU block wall or pre-engineered metal building. Water from the pump station would discharge into an above-ground header pipe located within the building. From the header pipe, the piping would go below-grade and connect to the proposed distribution main in Hatch Road. Associated on-site infrastructure would include a drain line with a valve and blind flange.

Site improvements include construction of an 8-foot-tall exterior block wall, access gates, security monitors, 20-foot LED lighting fixtures, a 50-foot antenna tower, vehicle parking, and frontage landscaping.

All unused portions of the 1.84-acre well site would be covered with asphalt. Access to the project site would be provided by a new 20-foot-wide driveway via the future extension of East Cardella Road.

Construction

The Well 22 Project would be constructed in three phases, as described below.

Phase 1

Phase 1 would include the completion of a temporary test well: preparation of the well site area and grading to create a temporary bermed area to contain and percolate well development water; well drilling, test pumping, and water sampling for laboratory analysis. Overall construction of the Well 22 facilities under Phase 1 would occur over approximately 90 work days. However, the well drilling activities would occur around the clock for a limited period of approximately six to ten calendar days out of the 90 total work days.

Phase 2

Phase 2 would include the completion of the new municipal well. Construction activities would initiated with installing and sealing a 34-inch conductor casing in a 48-inch diameter hole to an approximate depth of approximately 50 feet. This casing string would provide the primary sanitary protection of the well. The production borehole would be advanced though the conductor casing, and would be drilled at a diameter of 28-inches to a depth of approximately 640 feet. A casing assembly, consisting of 18-inch blank well casing and well screen, would be installed in the production borehole. An annular seal of cement grout would be installed to a depth of 200 feet or more. A gravel envelope from the annular seal to the borehole depth of 640 feet would be installed around the well screen to retain the unconsolidated aquifer materials (sand and gravel) and allow sand-free production from the well. An engine-driven deep well turbine test pump would be installed for final well development and testing. As with Phase 1 above, well development water would be retained in a temporary bermed area. Overall construction of the Well 22 facilities under Phase 2 would occur over approximately 120 work days. However, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

Phase 3

Phase 3 would include the completion of the new pump station including: installation of a new concrete masonry pump building, asphalt concrete paving, storm water basin, submersible well pump, station piping, water storage tank, backup diesel generator, fuel tank, system controls, electrical transformer, motor control panel, concrete masonry walls, security gates, yard lighting, and landscaping.

The construction of Phase 3 would take approximately 18 months.

The total time for completing all phases is estimated at 36 months, when allowing for the interim design period as well as contract bidding and start up for each construction phase. All work would be performed between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day, as noted above.

Construction of the project is anticipated to start in April 2021 and end in April 2024.

ENVIRONMENTAL SETTING

Characteristics of Sound

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 dB, 20 dB are 100 times more intense, and 30 dB are 1,000 times more intense. Thirty dB represents 1,000 times as much acoustic energy as one decibel. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source, noise in a relatively flat environment with absorptive vegetation, decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and

community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise levels of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

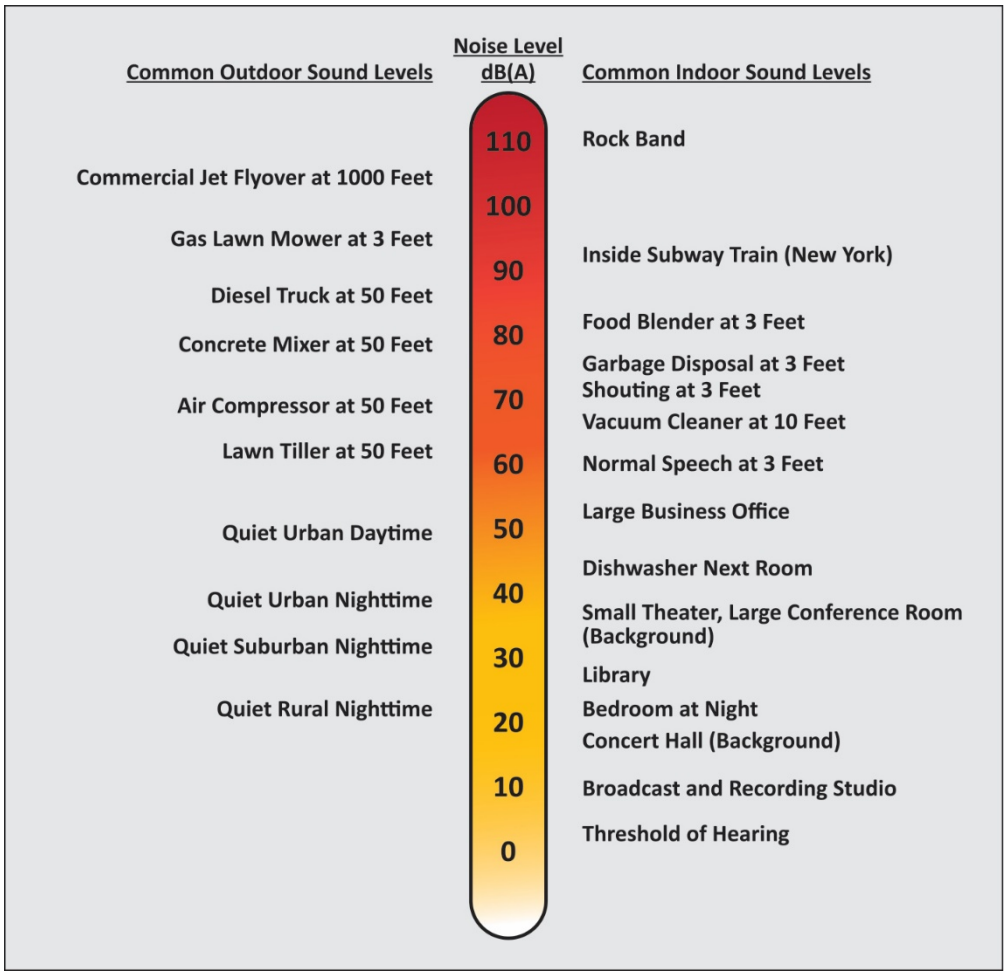
Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160–165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas. Table 1 lists definitions of acoustical terms, and Table 2 shows common sound levels and their sources.

Table 1: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power, the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter deemphasizes the very low and very high frequency components of the sound in a manner similar to the frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this assessment are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: Harris, Cyril M. *Handbook of Acoustical Measurements and Noise Control* (1991).

Table 2: Common Sound Levels and Noise Sources



Source: LSA, Associates, Inc., 2016.

Regulatory Framework

The federal, State, and local framework for noise standards is outlined below. The County of Merced has established standards in the General Plan for projects that could potentially expose sensitive receptors to excessive noise levels.

U.S. Environmental Protection Agency

In 1972 Congress enacted the Noise Control Act. This act authorized the U.S. Environmental Protection Agency (U.S. EPA) to publish descriptive data on the effects of noise and establish levels of sound *requisite to protect the public welfare with an adequate margin of safety.* These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table 3. The U.S. EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The U.S. EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table 3: Summary of U.S. EPA Noise Levels

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: U.S. Environmental Protection Agency. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (March 1974).

The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table 4. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 feet, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

Table 4: Summary of Human Effects in Areas Exposed to 55 dBA L_{dn}

Type of Effect	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 0.35 meter. 99 percent sentence intelligibility (average) at 1.0 meter. 95 percent sentence intelligibility (average) at 3.5 meters.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below "vigorous action."
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Source: U.S. Environmental Protection Agency. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (March 1974).

State of California

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard", it requires noise-sensitive land uses to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the building. State regulations include

requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

County of Merced

The County of Merced addresses noise in the Health and Safety Element of the General Plan and in the County Code. The Noise Element of the General Plan provides goals and policies, that work to protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise. Policy HS-7.12 requires new projects to include appropriate noise mitigation measures to reduce noise levels in compliance with the standards shown in Table 5 within sensitive areas. If a project includes the creation of new non-transportation noise sources, require the noise generation of those sources to be mitigated so they do not exceed the interior and exterior noise level standards of Table 5 at existing noise-sensitive areas in the project vicinity.

The County Code addresses construction activity noise and states that construction activities are exempt from the County's noise standards provided that activities occur between the hours of 7:00 a.m. to 6:00 p.m. and that all construction equipment shall be properly muffled and maintained.

Existing Noise Environment

Major sources of noise in the County of Merced include cars and trucks, trains, and aircraft. Other sources of noise include home appliances, tools, and construction equipment. The predominant sources of noise at the project site include agriculture and low-density neighborhood, consisting of noise from existing nearby residences and traffic along East Cardella Road and Hatch Road.

Certain land uses are considered more sensitive to noise than others. Examples of these land uses include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. As noted in the Project Description, the project site is located in an unincorporated area of Merced County that is predominantly developed with residential units on parcels up to three acres in size. Single-family homes are located directly south and northeast of the proposed well site. The adjacent residential uses rely on residential groundwater wells and septic tanks. Land to the west of the proposed well site is used for agricultural production, and land to the north of the project site is not developed and is not in active agricultural use. The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road.

Table 5: Non-Transportation Noise Standards

Median (L_{50})/Maximum (L_{max})[1]				
Receiving Land use	Outdoor Area[2]		Interior[3]	Notes
	Daytime	Nighttime	Day or Night	
All Residential	55/75	50/70	35/55	
Transient Lodging	55/75	-	35/55	4
Hospitals & Nursing Homes	55/75	-	35/55	5,6
Theaters & Auditoriums	-	-	30/50	6
Churches, Meeting Halls, Schools, Libraries, etc.	55/75	-	35/60	6
Office Buildings	60/75	-	45/65	6
Commercial Buildings	55/75	-	45/65	6
Playgrounds, Parks, etc.	65/75	-	-	6
Industry	60/80	-	50/70	6

Source: County of Merced (2013).

Notes:

[1] These standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards in this table, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

[2] Sensitive Outdoor Areas include primary outdoor activity areas associated with any given land use at which noise-sensitivity exists and the location at which the County's exterior noise level standards are applied.

[3] Sensitive Interior Areas includes any interior area associated with any given land use at which noise-sensitivity exists and the location at which the County's interior noise level standards are applied. Examples of sensitive interior spaces include, but are not limited to, all habitable rooms of residential and transient lodging facilities, hospital rooms, classrooms, library interiors, offices, worship spaces, theaters. Interior noise level standards are applied within noise-sensitive areas of the various land uses with windows and doors in the closed positions.

[4] Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.

[5] Since hospitals are often noise-generating uses, the exterior noise level standards are applicable only to clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

[6] The outdoor activity areas of these uses (if any) are not typically used during nighttime hours.

[7] Where median (L_{50}) noise level data is not available for a particular noise source, average (L_{eq}) values may be substituted for the standards of this table provided the noise source operates for at least 30 minutes. If the source operates less than 30 minutes the maximum noise level standards shown shall apply.

THRESHOLDS OF SIGNIFICANCE

The State CEQA Guidelines indicate that a project would have a significant impact on noise if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- 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, expose people residing or working in the project area to excessive noise levels.

IMPACTS AND MITIGATION MEASURES

The following section discusses the potential noise and vibration impacts associated with implementation of the proposed project.

Generation of Substantial Increase in Ambient Noise Levels

The following section describes how the short-term construction and long-term operational noise impacts of the proposed project would be less than significant with mitigation incorporated.

Short-Term (Construction) Noise Impacts

Project construction would result in short-term noise impacts on the nearby sensitive receptors. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The level and types of noise impacts that would occur during construction are described below.

Short-term noise impacts would occur during grading and site preparation activities. Table 6 lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and materials to the site, which would incrementally increase noise levels on roads leading to the site. As shown in Table 6, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during grading and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table 6: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Maximum Noise Level (L_{max}) at 50 Feet[1]
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95
Jackhammers	20	85
Pick-up Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rock Drills	20	85
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Welder	40	73

Source: Roadway Construction Noise Model (FHWA 2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.
[1] Maximum noise levels were developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.
L_{max} = maximum instantaneous sound level

Table 6 lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 87 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Specific construction details (e.g., construction fleet activities) are not yet known, therefore, this analysis assumes a crane, forklift, tractor, welder, and compressor would be operating simultaneously during construction of the proposed project. Based on the typical construction equipment noise levels shown in Table 6, noise levels associated with a crane, forklift, tractor, welder, and compressor operating simultaneously would be approximately 87 dBA L_{max} at 50 feet.

The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. Therefore, the closest

sensitive receptor may be subject to short-term maximum construction noise reaching 87 dBA L_{max} during construction. However, construction equipment would operate at various locations within the 4.01-acre project site and would only generate this maximum noise level when operations occur closest to the receptor.

However, construction noise would be intermittent and sporadic as construction phasing occurs. Noise levels would attenuate at sensitive receptors as construction activity moves further into the site. Construction noise is permitted by the County when activities occur between the hours of 7:00 a.m. to 6:00 p.m. and all construction equipment is properly muffled and maintained.

As discussed in the Project Description, all work would be performed between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. The exception would be for the well drilling tasks during Phases 1 and 2 for which drilling would occur 24 hours per day. Based on the construction equipment noise levels identified in Table 6, well drilling tasks would generate noise levels of approximately 85 dBA L_{max}. As identified above, the closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the well would be located within the pump station, which would be located approximately 330 feet from the residence. Based on a reduction in noise of 6 dBA per doubling of distance, there would be a decrease of approximately 16 dBA from the pump station area to the nearest residence. Therefore, the closest sensitive receptor would be subject to noise levels of approximately 69.0 dBA L_{max} from well drilling tasks. These construction activities would occur outside the County's permitted hours; however during Phase 1, the well drilling activities would occur around the clock for a limited period of approximately 6 to 10 calendar days out of the 90 total work days. Additionally, during Phase 2, the well drilling activities would occur around the clock for a limited period of approximately 8 to 14 calendar days out of the 120 total work days.

As discussed above, construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Mitigation Measure NOI-1 would be required reduce potential construction period noise impacts for the indicated sensitive receptors to a less-than-significant level.

Mitigation Measure NOI-1 The project contractor shall implement the following measures during construction of the project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.

- Prohibit extended idling time of internal combustion engines.
- Designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

Long-Term Noise Impacts

Operation of the proposed project would result in the generation of noise levels above existing conditions. The project would include the construction a new municipal water supply well and pumping station. Well 22 would be designed to yield 2,500 gallons per minute and would be connected to the City's existing water supply distribution network. Associated infrastructure that would be constructed as part of the project would include an approximately 10,000 square-foot CMU block wall or pre-engineered metal building containing the wellhead, wellhead piping, booster pump station pumps, booster pump station piping. The building would also include electrical, a SCADA computer system, auxiliary generator equipment and fuel tank, restrooms, chemical feed equipment and discharge piping with metering and waste piping. Chemicals, such as chlorine, fluoride, sodium hypochlorite and sodium fluoride, would be stored within the project site. The project would also include construction of a fuel tank, transformer and pad, and drain box.

The components of the proposed project that would generate the most noise would be the booster pumps used for boosting pressure. Based on reference noise measurements previously conducted by LSA, mechanical equipment-related noise, including the generator, would generate noise levels of approximately 75 dBA L_{max} at 3 feet, while each booster pump is conservatively estimated to generate 65 dBA L_{max} at 20 feet from the pump. This analysis assumes that pumps and equipment associated with the proposed project would operate 24 hours a day 7 days a week.

As identified above, the closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the pump station would be located approximately 330 feet from the residence. Based on a reduction in noise of 6 dBA per doubling of distance, there would be a decrease of approximately 24 dBA from the pump station area to the nearest residence. Therefore, the closest sensitive receptor would be subject to noise levels of approximately 38.0 dBA L_{max} from booster pump operations. As shown in Table 5 above, the County sets exterior noise level standards at 55 dBA L_{eq} and 75 dBA L_{max} at receiving residential land uses. Therefore, the maximum noise levels associated with operation of the pump station would not exceed the County's standard of 75 dBA L_{max}. In addition, as identified above, this analysis assumes that the proposed project would operate up to 24 hours a day 7 days a week. When averaged over a 24-hour period, this noise level would also not exceed the County's noise level standards of 55 dBA L_{eq} for residential land uses. Based on standard exterior to interior noise attenuation rates, with windows closed the interior noise level of 35 dBA L_{eq} and 55 dBA L_{max} for residential land uses would be met. In addition, a CMU wall would be constructed around the pump station, which would screen the residence and reduce noise levels.

Therefore, the proposed project would not expose persons to noise levels in excess of noise standards.

Generation of Excessive Groundborne Vibration

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Vibration energy propagates from a source, through intervening soil and rock layers, to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as the motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are construction activities (e.g., pavement breaking and operating heavy-duty earthmoving equipment), and occasional traffic on rough roads. In general, groundborne vibration from standard construction practices is only a potential issue when within 25 feet of sensitive uses. Groundborne vibration levels from construction activities very rarely reach levels that can damage structures; however, these levels are perceptible near the active construction site. With the exception of old buildings built prior to the 1950s or buildings of historic significance, potential structural damage from heavy construction activities rarely occurs. When roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible.

The streets surrounding the project area are paved, smooth, and unlikely to cause significant groundborne vibration. In addition, the rubber tires and suspension systems of fire engines and other on-road vehicles make it unusual for on-road vehicles to cause groundborne noise or vibration problems. It is, therefore, assumed that no such vehicular vibration impacts would occur and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once constructed, the proposed project would not contain uses that would generate groundborne vibration.

Construction Vibration

Construction of the proposed project could result in the generation of groundborne vibration. This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and will assess the potential for building damages using vibration levels in PPV (in/sec) because vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration level in PPV is best used to characterize potential for damage. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guidelines indicate that a vibration level up to 102 VdB (an equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table 7 shows the PPV and VdB values at 25 feet from a construction vibration source. As shown in Table 7, bulldozers and other heavy-tracked construction equipment (except for pile drivers and

vibratory rollers) generate approximately 87 VdB of groundborne vibration when measured at 25 feet, based on the Transit Noise and Vibration Impact Assessment. At this level, groundborne vibration would result in potential annoyance to residents and workers, but would not cause any damage to the buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/office buildings in the project vicinity). Outdoor site preparation for the proposed project is expected to include the use of bulldozers and loaded trucks. The greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels.

Table 7: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 feet	
	PPV (in/sec)	L_V (VdB)[a]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Sources: *Transit Noise and Vibration Impact Assessment* (FTA 2018).

[a] RMS vibration velocity in decibels (VdB) is 1 µin/sec.

µin/sec = micro-inches per second
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below.

$$L_vdB\ (D) = L_vdB\ (25\ ft) - 30\ Log\ (D/25)$$
$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

The closest sensitive receptor to the project site includes the single-family residence located approximately 50 feet south of the project site boundary, along Hatch Road. However, the closest structure to the project site boundary includes the detached garage associated with the residence, located approximately 25 feet from the project site boundary. At 25 feet, the vibration level at the nearest building from construction equipment would not exceed the FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. Although construction vibration levels at nearby buildings would have the potential to result in annoyance, these vibration levels would no longer occur once construction of the project is complete. Therefore, groundborne vibration impacts from construction activities associated with the proposed project would not be considered significant.

Aircraft Noise Impacts

The proposed project is not located within 2 miles of a public or public use airport. The nearest airports to the project site include Merced Regional Airport, located approximately 5.5 miles southwest of the project site, and Castle Airport, located approximately 6.2 miles northwest of the project site. Aircraft noise is occasionally audible at the project site; however, no portion of the project site lies within the 55 dBA CNEL noise contours of any public airport nor does any portion of the project site lie within 2 miles of any private airfield or heliport. Therefore, the proposed project would not result in the exposure of people residing or working in the project area to excessive noise levels.

CONCLUSION

Based on the analysis presented above, construction of the proposed project could result in short-term noise impacts on nearby residential uses; however construction noise would be short-term and Mitigation Measure NOI-1 would reduce the construction noise impacts to the extent feasible. In addition, long-term operation of the proposed project would also not create a significant increase in operational noise, including noise associated with booster pumps. In addition, during construction of the proposed project, vibration levels at the closest structures from construction equipment would not exceed the FTA threshold. Additionally, once constructed, the proposed project would not contain uses that would generate groundborne vibration. The proposed project would also not result in the exposure of people residing or working in the project area to excessive noise levels.

Attachments:

Figure 1 – Project Location and Regional Vicinity Map
Figure 2 – Aerial Photograph of the Project Site and Surrounding Land Uses
Figure 3 – Conceptual Site Plan

LSA

LEGEND

Project Site

FIGURE 1

N

0 750 1500

FEET

SOURCE: ESRI World Maps (08/19); Google Maps Sat (08/2019).

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Merced Municipal Well Site 22 Project

Project Location and Regional Vicinity Map

LSA

FIGURE 2

0 500 1000
FEET

N

Project Site

Merced Municipal Well Site 22 Project

Aerial Photograph of the Project Site and Surrounding Land Uses

SOURCES: GOOGLE EARTH, 5-16-18; LSA, 2019.

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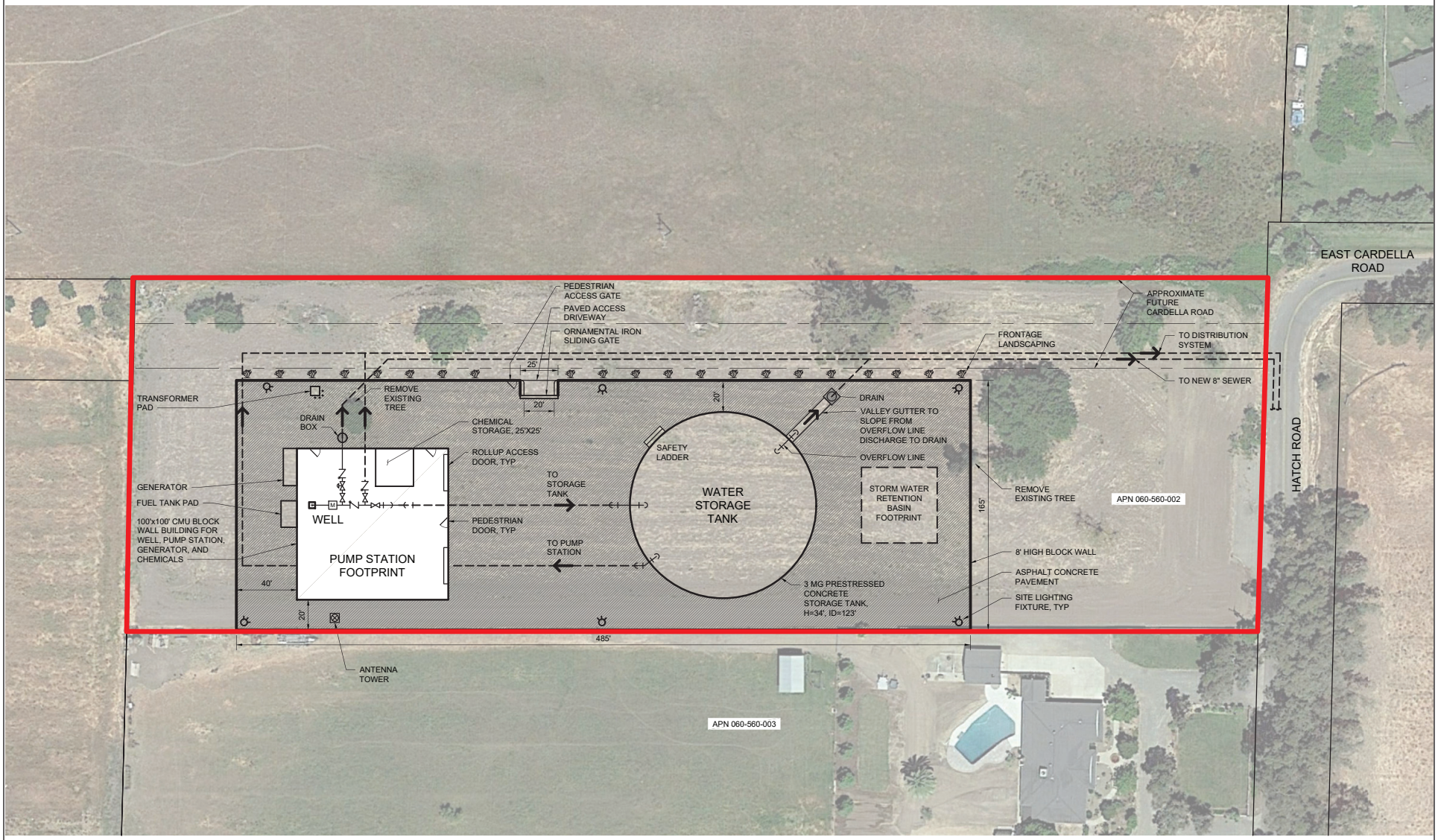

LSA

FIGURE 3

0 60 120
FEET

N

Project Site

Merced Municipal Well Site 22 Project
Conceptual Site Plan

SOURCE: MKN, 2019.

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