

DRAFT

**ENVIRONMENTAL IMPACT REPORT
FOR THE
HILLCREST DAIRY
EXPANSION PROJECT**

CONDITIONAL USE PERMIT CUP20-013



**COUNTY OF MERCED
DEPARTMENT OF COMMUNITY AND ECONOMIC DEVELOPMENT**

Prepared with the Technical Assistance of:
Environmental Planning Partners, Inc.



SCH # 2021090490
July 2022

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2222 'M' Street
Merced, CA 95340

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FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
≈	Almost equal to
AAQA	Ambient Air Quality Analysis
AAQS	Ambient Air Quality Standard
ACBM	Asbestos containing building materials
ACO	Animal Confinement Ordinance
Acre	43,560 square feet
ADT	Average Daily Trips
Air Basin	San Joaquin Valley Air Basin
Ammonia (NH ₃)	Gaseous ammonia released by the microbiological decay of plant and animal proteins
AMMP	Alternative Manure Management Program
APCD	Air Pollution Control District
APCO	Air Pollution Control Office
APE	Area of Potential Effect
APN	Assessors Parcel Number
ARB	Air Resources Board
AQIA	Air Quality Impact Assessment
AQMD	Air Quality Management District
ATC	Authority to Construct
AU	Animal Units
BACM	Best Available Control Measures
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Control Technology
bgs	Below ground surface
BFE	Base flood elevation
BMP	Best Management Practices

Acronym/Abbreviation	Definition
BPS	Best Performance Standards
BPTC	Best Practicable Treatment or Control
CAA	Federal Clean Air Act
CAAA	Federal Clean Air Act Amendments of 1990
CAAQS	California Ambient Air Quality Standards
CAF	Confined Animal Facility
CAFO	Confined or Concentrated Animal Feeding Operation
CalEPA	California Environmental Protection Agency
CAP	Climate Action Plan
CARB	California Air Resources Board
CASGEM	California Statewide Groundwater Elevation Monitoring Program
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CCAT	California Climate Action Team
CCIC	Central California Information Center
CCR	California Code of Regulations
CDC	Center for Disease Control and Prevention
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEDD	Community and Economic Development Department, Merced County
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH ₄	Methane
CHRIS	California Historical Resources Information Systems
CLAQC	Confined Livestock Air Quality Committee of the USDA
CMP	Conservation Management Practices
CNDDB	California Natural Diversity Database
CNMP	Comprehensive Nutrient Management Plan
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon dioxide equivalent
Corps	United States Army Corps of Engineers
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CUP	Conditional Use Permit
CVDRMP	Central Valley Dairy Representative Monitoring Program
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long Term Sustainability
CWA	Clean Water Act
DDRDP	Dairy Digester Research and Development Program
DEH	Division of Environmental Health, Merced County

Acronym/Abbreviation	Definition
DEIR	Draft Environmental Impact Report
DHS	Department of Health Services
DPAG	Dairy Permitting Advisory Group
DPM	Diesel Particulate Matter
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	US Environmental Protection Agency
EPCA	Energy Policy and Conservation Act of 1975
EUI	Energy Utilization Index
FDA	United States Food and Drug Administration
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIRM	Flood Insurance Rate Maps
GAMAQI	Guide for Assessing Air Quality Impacts, SJVAPCD 2015
gpm	Gallons per minute
GHG	Greenhouse Gas
GMP	Groundwater Management Plan
GSA	Groundwater sustainability agency
GSP	Groundwater sustainability plans
GWMA	Grasslands Wildlife Management Area
H ₂ S	Hydrogen sulfide
HDPE	High Density Polyethylene
HCP	Habitat Conservation Plan
HI	Health Hazard Index
HMBP	Hazardous Material Business Plan
HNO ₃	Nitric Acid
HRA	Health Risk Assessment
ILRP	Irrigated Lands Regulatory Program
INMP	Irrigation and Nitrogen Management Plan
IPCC	International Panel on Climate Change
IS	Initial Study
LED	Light Emitting Diode
LRP	Legally Responsible Person
LSAA	Lake / Streambed Alteration Agreement
MBTA	Migratory Bird Treaty Act
MCF	Methane Conversion Factor
MCL	Maximum Contaminant Level
MEI	Maximally exposed individual
MID	Merced Irrigation District
MIUGSA	Merced Irrigation-Urban Groundwater Sustainability Agency
MMRP	Mitigation Monitoring and Reporting Plan
MMT	Million metric tons
MNWR	Merced National Wildlife Refuge
MRP	Monitoring and Report Program

Acronym/Abbreviation	Definition
MSL	Mean Sea Level
MWISP	Monitoring Well Installation and Sampling Plan
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAL	Numeric action level
NCCP	Natural Community Conservation Plan
NCP	Nitrate Control Plan
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NH ₃	Ammonia
NHPA	National Historic Preservation Act
Nitrogen	A chemical element, commonly used in fertilizer as a nutrient, which is also a component of animal wastes
NMFS	National Marine Fisheries Service
NMP	Nutrient Management Plan
NMVOC	Nonmethane volatile organic compounds
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NOP	Notice of Preparation
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRC	National Research Council
NRCS	National Resource Conservation Service (formerly, Soil Conservation Service, USDA)
NSR	New Source Review
NUE	Nitrogen use efficiency
NWI	USFWS National Wetland Inventory
O ₃	Ozone
OH-	Hydroxyl Radical
OPR	Office of Planning and Research
OSAP	Open Space Action Plan, Merced County General Plan
OSDRS	Open Space Development Review System
OWTS	Onsite Wastewater Treatment System
PAR	Preliminary Application Review
Pb	Lead
PCSD	Planada Community Services District
PEL	Permissible Exposure Limit
PM ₁₀	Suspended Particulate Matter; Ten micron Particulates
PM _{2.5}	Fine Particulate Matter
ppb	Parts per billion
ppm	Parts per million
PRC	Public Resources Code
PRD	Permit Registration Documents
PSD	Prevention of Significant Deterioration
PTO	Permit to Operate

Acronym/Abbreviation	Definition
RACT	Reasonably Available Control Technology
REAP	Rain Event Action Plan
REL	Reference Exposure Level
RLEP	Ruminant Livestock Efficiency Program
RMP	Representative Monitoring Program
RMR	Risk Management Review
ROG	Reactive Organic Gases
ROWD	Report of Waste Discharge
RPS	Renewables Portfolio Standard
RWCQB	Regional Water Quality Control Board
SCH	State Clearinghouse
SCP	Sediment Control Plan
SDWA	Safe Drinking Water Act
SGMA	Sustainable Groundwater Management Act of 2014
SIL	Significant Impact Level
SIP	State Implementation Plan
SJVAB	San Joaquin Air Valley Basin
SJVAPCD	San Joaquin Air Pollution Control District
SLCP	Short-Lived Climate Pollutant
SO ₂	Sulfur Dioxide
SO _x	Sulfur Oxide
SR	State Route
SUDP	Specific Urban Development Plan
SWEEP	State Water Efficiency and Enhancement Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TBWG	Tricolored Blackbird Working Group
TDS	Total Dissolved Solids
TLV	Threshold Limit Value
TMDL	Total Maximum Daily Load
TMR	Total Mixed Ration
TOG	Total Organic Gases
µg/m ³	Micrograms per Cubic Meter
UBC	Uniform Building Code
UNFCCC	United Nations' Framework Convention on Climate Change
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VERA	Voluntary Emission Reduction Agreement
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WDR	Waste Discharge Requirement
WMP	Waste Management Plan

1 INTRODUCTION

1.1 PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

The evaluation of projects to determine their effects on the physical environment is required by the California Environmental Quality Act (CEQA). When a project could have a significant effect on the environment, the agency with primary responsibility over the approval of the project (the lead agency) is required to prepare an Environmental Impact Report (EIR). As stated in the State CEQA Guidelines Section 15121¹:

An EIR is an informational document which will inform public agency decision makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information which may be presented to the agency (*when considering whether to approve a project*).

An EIR is the public document used to meet these requirements. The EIR must also disclose: significant adverse environmental impacts that cannot be avoided; growth inducing impacts; effects not found to be significant; and the significant cumulative impacts of all past, present and reasonably foreseeable future projects. From this point forward, an “impact” or “significant impact” is assumed to be an adverse effect on the environment.

This EIR is intended to provide information to the public and to decision makers regarding the potential environmental effects of adoption and implementation of the Hillcrest Dairy Expansion project. Prior to considering approval of this request, Merced County (County) must certify that this EIR is adequate under CEQA and that County decision makers have considered the information herein. Upon making this finding, the County may then consider approval of the Hillcrest Dairy Expansion project further described in the Project Description in Chapter 3.

1.2 TYPE OF ENVIRONMENTAL IMPACT REPORT

This EIR is being prepared as a “Project” EIR pursuant to the State CEQA Guidelines Section 15161. This project EIR is tiered from the EIRs for the *2030 Merced County General Plan* (certified on December 10, 2013) and the *Merced County Animal Confinement Ordinance Revision* as certified and adopted on October 22, 2002. (For a discussion of tiering in this document, see Section 1.4 below.) A project EIR is prepared to examine the environmental impacts of a specific development project. According to the State CEQA Guidelines Section 15161, “(t)his type of EIR should focus primarily on the changes in the environment that would result from the development project. The EIR shall examine all phases of the project, including planning, construction, and operation.” This EIR is intended to serve as the environmental document for all activities related to the Hillcrest Dairy Expansion project described more fully in the Project Description, including issuance of a Conditional Use Permit and construction and building permits by Merced County, and appropriate permits from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the California Central Valley Regional Water Quality Control Board (CVRWQCB).

¹ Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.

1.3 PUBLIC REVIEW AND CEQA PROCESS

CEQA provides three opportunities for public participation during the environmental review process. These points are: (1) during the Notice of Preparation (NOP), when the public and agencies are informed that an EIR is to be prepared and are requested to comment on the scope and contents of the proposed EIR; (2) upon circulation of the Draft EIR when the public and agencies can comment on the adequacy of the environmental document; and (3) finally, after circulation of the Final EIR, when the public and agencies can evaluate the lead agency's responses to comments submitted on the Draft EIR.

In the case of the Hillcrest Dairy Expansion EIR, the Notice of Preparation of an EIR was filed with the Office of Planning and Research (OPR) on September 24, 2021. The NOP and Initial Study were circulated to the public, local and state agencies, and other interested parties to solicit comments on the proposed project. Environmental issues and alternatives raised by comments received on the NOP during the 30-day public review period were considered for inclusion in the EIR (see Appendices A and B). There were four comments received in response to the NOP. These comments were reviewed, and environmental issues identified in the comment letters were individually referenced in Appendix B to indicate the specific section in the EIR where these issues are addressed.

Pursuant to the State CEQA Guidelines, the focus of this Draft EIR includes the specific issues identified in the NOP, as well as concerns identified in the responses to the NOP.

This Draft EIR will be published and circulated for public comment for a period of 45 days. Written and emailed comments from the public and interested and responsible agencies may be submitted at any time during the comment period. Written and emailed comments should be submitted to:

<p>Merced County Community and Economic Development Department 2222 'M' Street Merced, CA 95340 (209) 385-7654 Diana.Lowrance@countyofmerced.com</p>
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For emailed comments, please include the phrase, "Hillcrest Dairy Expansion EIR" in the subject line.

After the close of the comment period, the County will respond in writing to all comments submitted during that time. The comments and responses will be published for agency and public review prior to the action of the Merced County Planning Commission on certification of the EIR. The Draft EIR, the comments and responses, including any revisions of the Draft EIR contained therein, together with a Mitigation Monitoring and Reporting Program (MMRP) as described below, will constitute the Final EIR that the County will evaluate for certification, based on review and consideration of the EIR and other evidence presented in the public record.

Prior to certification of the EIR, the County will prepare written findings of fact for each significant environmental impact identified in the EIR, which in turn must be supported by substantial evidence in the administrative record. For each significant impact, the County must:

- determine that changes in the project (*typically adopted mitigation measures*) have been made to substantially reduce the magnitude of the impact;
- determine that the changes (*mitigation measures*) to the project are within another agency's jurisdiction, and have been or should be adopted; or,
- find that specific economic, social, legal, technical, or other considerations make mitigation measures or alternatives infeasible (CEQA Guidelines Section 15091(a)).

After considering the Final EIR in conjunction with making findings, if the proposed project would result in significant environmental impacts after imposition of feasible mitigation measures, the County may approve the project if the benefits of the project outweigh the unavoidable environmental effects. Under these circumstances, a Statement of Overriding Considerations would be prepared explaining why the County is willing to accept each significant effect (CEQA Guidelines Section 15093(c)).

CEQA requires that when a public agency makes findings based on an EIR, the public agency must adopt a MMRP based on those measures that the agency has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment (California Public Resources Code [PRC] Section 21081.6). The reporting or monitoring plan must be designed to ensure compliance with the adopted measures during project implementation (PRC Section 21081.6). The MMRP for this project will be prepared and circulated under separate cover for consideration by the County in conjunction with certification of the Final EIR.

1.4 APPLICATION OF THE 2030 MERCED COUNTY GENERAL PLAN, MERCED COUNTY ANIMAL CONFINEMENT ORDINANCE, AND MERCED COUNTY ZONING CODE

1.4.1 2030 MERCED COUNTY GENERAL PLAN

The 2030 Merced County General Plan guides economic development, land use, agriculture, transportation and circulation, public facilities and services, natural resource, recreation and cultural resources, health and safety, air quality, water, and other matters of public interest and concern. The General Plan is intended to provide for orderly growth, and to convey the community's values and expectations for the future. An EIR for the 2030 General Plan was certified and the General Plan adopted by Merced County in December 2013. A Draft Background Report of existing environmental conditions within the County was finalized in December 2013 with certification of the General Plan EIR. The Background Report functions as the existing setting section for the General Plan EIR. The EIR, including the Background Report as updated, is used in this Hillcrest Dairy Expansion EIR, along with other resources, to establish the existing setting for the proposed project. The General Plan EIR will serve as the first tier of environmental analysis for the proposed project, including the evaluation of countywide and cumulative impacts. The 2030 General Plan EIR, including the Background Report, is hereby incorporated by reference pursuant to State CEQA Guidelines Section 15150 as though fully set forth herein. A copy of the General Plan, General Plan EIR, and Background Report can be obtained at the Department of Community and Economic Development, 2222 "M" Street, Merced, CA 95340. These documents are also available for download from the Merced County General Plan website at:

<https://www.co.merced.ca.us/100/General-Plan>

1.4.2 MERCED COUNTY ANIMAL CONFINEMENT ORDINANCE AND ZONING CODE

On October 22, 2002, Merced County adopted revisions to the County's Animal Confinement Ordinance (ACO). Additional revisions to the Merced County ACO and Merced County Code Chapter 18.10 (Zoning Code Agricultural Zones) were adopted on February 8, 2005 (the text of the ACO is included in Appendix C, bound separately). (The Merced County ACO is included as a section of Title 18 Zoning of the Merced County Code.) A comprehensive update and amendment of Title 18 of the Merced County Code was adopted by the Board of Supervisors on October 22, 2019. (No substantive changes were made to the ACO during this update.) The ACO regulates the design, construction, and operation of animal confinement facilities within the county. Because the Ordinance is regulatory rather than permissive, all existing and proposed animal confinement facilities within the county are required to comply with the terms of the Ordinance, including the proposed Hillcrest Dairy Expansion project.

Following is a summary of major ACO provisions. Copies of the complete text of the Ordinance are available from: the Merced County Division of Environmental Health (DEH), 260 East 15th Street, Merced, California 95341; the Merced County Community and Economic Development Department, 2222 'M' Street, Merced, California 95340; Appendix C of this document; and on the County's website at <<http://www.qcode.us/codes/mercedcounty/>>

Merced County's ACO provides environmental compliance regulations that affect dairies and other animal confinement facilities in Merced County. The ACO requires that all animal confinement facilities, existing and new, complete and implement a Comprehensive Nutrient Management Plan (CNMP). For the construction of a new confined animal facility, or for modification or expansion of an existing animal confinement facility, the CNMP must be completed prior to construction. The purpose of the CNMP is to ensure a balance between manure/wastewater application and nutrient uptake by crops in order to minimize impacts to groundwater. Since adoption of the ACO, the CVRWQCB has issued new requirements for the preparation of a Nutrient Management Plan (NMP) and Waste Management Plan (WMP), which would serve in place of the CNMP as allowed by County Code Chapter 18.64.060 K. Both the NMP and the WMP have been prepared for the Hillcrest Dairy Expansion project (see Appendix H, bound separately).

In addition to the CNMP, the ACO includes measures designed to increase protection of surface and groundwater resources. Both liquid and dry manure are regulated by the ACO under detailed management requirements. For example, the ACO prohibits the storage or application of manure (liquid or dry) within 100 feet of a surface water body or irrigation well unless adequate protection is provided. Dry manure storage and application is regulated to prevent groundwater or surface water contamination. In addition, the liquid manure management system must include provisions for appropriate cropland application and collection of tailwater from cropland irrigated with liquid manure. The ACO requires that all off-site discharge of drainage water from cropland application areas meet the discharge and receiving water standards of the appropriate irrigation or drainage district and the CVRWQCB.

The ACO also includes design and management provisions for the construction of retention ponds and settling basins to prevent groundwater contamination, obnoxious odors, or excessive fly or mosquito breeding. The retention pond provisions of the ACO apply only to new or expanding animal confinement facilities. The ACO measures for retention ponds and settling basins include capacity requirements, maintenance guidelines, size restrictions, and minimum design standards of 10⁻⁶ centimeters per second seepage velocity or less. However, the CVRWQCB's General Order establishes performance standards for new wastewater ponds that are more stringent and replace the ACO requirements.

To prevent nuisances from odors or vectors, the ACO requires animal confinement facilities to implement both odor control measures and a vector control plan. The need for specific control measures is determined by the Merced County DEH on a site-specific basis. Additionally, the ACO prohibits the location of new animal confinement facilities within one-half mile of urban areas, areas zoned for residential uses, or concentrations of rural residences. To provide additional protection from the nuisances mentioned above, the ACO generally prohibits the location of animal confinement facilities within 1,000 feet of an off-site residence, unless written permission from the off-site resident or property owner is given.

The ACO regulates the design, construction, and operation of animal confinement facilities within the County; all existing and proposed animal confinement facilities within the County are required to comply with the terms of the Ordinance, including the Hillcrest Dairy Expansion project. To ensure compliance with the provisions of the ACO, the Ordinance requires routine inspections of animal confinement facilities by Merced County DEH. Enforcement of the provisions contained in the revised ACO is conducted by Merced County DEH and the Community and Economic Development Department. In addition, the ACO includes penalties for any person who violates or fails to comply with the provisions of the ACO.

MERCED COUNTY ANIMAL CONFINEMENT ORDINANCE REVISION EIR

The Merced County Board of Supervisors certified the EIR and adopted the revised ACO on October 22, 2002 (SCH #2000072024). The environmental conclusions of the 2002 EIR were subsequently reconfirmed in an Addendum to the EIR prepared and certified by the County on February 8, 2005. The ACO EIR comprehensively evaluated the potential environmental effects of implementing the revisions to the ACO and from approval of new or expanding animal confinement facilities. The ACO EIR identified a number of mitigation measures that would reduce the magnitude of these potential effects. Those measures were subsequently adopted by the County as conditions of approval for the revisions to the ACO, and a Mitigation Monitoring Program was adopted. Because the Hillcrest Dairy Expansion project is subject to the requirements of the ACO for new and expanding animal confinement facilities, those previously adopted mitigation measures and conditions apply to the Hillcrest Dairy Expansion project, and would continue to apply after approval of the currently requested actions.

INCORPORATION OF THE ANIMAL CONFINEMENT ORDINANCE EIR BY REFERENCE

The EIR for the ACO Revision contains a comprehensive analysis of environmental effects for new and expanding animal confinement facilities in Merced County, including a cumulative analysis of herd forecast conditions. The 2030 General Plan EIR updated and expanded the environmental analyses and conclusions presented in the 2002 ACO EIR regarding the cumulative condition for all project types, including proposed and expanding dairy facility projects such as the Hillcrest Dairy Expansion project. Because of its importance relative to understanding the environmental analysis that has occurred to date with respect to the potential environmental impacts associated with the construction and operation of animal confinement facilities in Merced County, the ACO EIR is hereby incorporated by reference pursuant to State CEQA Guidelines Section 15150 as though fully set forth herein. A copy of the ACO EIR can be reviewed at the Merced County Division of Environmental Health, 260 East 15th Street, Merced, California 95341.

1.5 TIERING FROM BOTH THE 2030 MERCED COUNTY GENERAL PLAN EIR AND THE MERCED COUNTY ANIMAL CONFINEMENT ORDINANCE EIR

“Tiering” refers to the relationship between a program-level EIR (where long-range programmatic cumulative impacts are the focus of the environmental analysis) and subsequent environmental analyses such as this subject document, which focuses primarily on issues unique to a smaller project within the larger program or plan pursuant to Section 15168 of the State CEQA Guidelines. Through tiering, a subsequent environmental analysis can incorporate, by reference, discussion that summarizes general environmental data found in the program EIR that establishes cumulative impacts and mitigation measures, the planning context, and/or the regulatory background. These broad-based issues need not be reevaluated subsequently, having been previously identified and evaluated at the program stage.

Tiering focuses the environmental review on the project-specific significant effects that were not examined in the prior environmental review or are susceptible to substantial reduction or avoidance by specific revisions in the project, by the imposition of conditions, or by other means. Section 21093(b) of the Public Resources Code requires the tiering of environmental review whenever feasible, as determined by the Lead Agency.

In the case of the Hillcrest Dairy Expansion project, the environmental analysis for this EIR is tiered from the EIR for the *2030 Merced County General Plan*. The Merced County Board of Supervisors certified the EIR and adopted the 2030 General Plan on December 10, 2013 (SCH #2011041067). The 2030 General Plan regulates the location, use, design, construction, and operation of developed land uses within the County; all existing and proposed land uses within the County are required to comply with the goals and policies of the 2030 General Plan, including the Hillcrest Dairy Expansion project. To reflect this, the requirements of the 2030 General Plan and conclusions of the environmental analysis contained in the 2030 General Plan EIR were incorporated into this EIR.

The 2030 General Plan EIR comprehensively evaluated the potential environmental effects of implementing the 2030 General Plan and from the approval of new or modified land uses. The 2030 General Plan EIR identified a number of mitigation measures that would reduce the magnitude of these potential effects. Those measures were subsequently adopted by the County in its approval of the 2030 General Plan, and a Mitigation Monitoring and Reporting Program was adopted. Because the Hillcrest Dairy Expansion project is consistent with, and implements, the 2030 General Plan, those previously adopted mitigation measures and conditions apply to the Hillcrest Dairy Expansion project, and would continue to apply after approval of the currently requested actions. Therefore, the Hillcrest Dairy Expansion project is related to the 2030 General Plan EIR and, pursuant to Section 15152(a) of the CEQA Guidelines, tiering of environmental documents is appropriate.

The 2030 General Plan EIR can be reviewed at the location set forth above.

INCORPORATION OF THE 2030 MERCED COUNTY GENERAL PLAN EIR BY REFERENCE

Based on the reasoning set forth above, this environmental evaluation implements, and is consistent with, the environmental conclusions, mitigation measures, and study protocols adopted by Merced County in its certification of the 2030 General Plan EIR and its approval of the 2030 Merced County General Plan. Because of its importance relative to understanding the environmental analysis that has

occurred to date with respect to the potential environmental impacts associated with the construction and operation of developed land uses in Merced County, the 2030 General Plan EIR is hereby incorporated by reference pursuant to CEQA Guidelines Section 15150 as though fully set forth herein.

SUMMARY OF THE IMPACT ANALYSIS OF THE 2030 MERCED COUNTY GENERAL PLAN EIR

The 2030 Merced County General Plan EIR presents an assessment of the environmental impacts associated with the implementation of the General Plan and land uses developed consistent with the Plan in Merced County. The EIR evaluated the environmental impacts of the Plan on a comprehensive basis, including discussion of the full range of impacts that would occur because of future development. The EIR identified potential significant environmental impacts arising from implementation of the General Plan and land uses developed consistent with the Plan for the following issue areas:

Aesthetics: light and glare; and cumulative impacts to visual quality.

Agriculture and Forestry: conversion of Important Farmland to non-agriculture use; conflict with zoning for agricultural use or provisions of the Williamson Act; land use changes that would result in conversion of farmland to non-agricultural uses from urban development; land use changes that would result in conversion of farmland to non-agricultural uses due to the Minor Subdivision of Rural Parcels or due to inadequate parcel sizes; and cumulative impacts to agricultural resources.

Air Quality: operational emissions of PM₁₀ and PM_{2.5} associated with General Plan buildout; health risks associated with locating sensitive receptors near high volume roads; cumulative impacts to air quality.

Biological Resources: adverse effects to special status species and sensitive habitats due to conversion of farmlands and open space; adverse effect on wetlands, riparian habitat, and other sensitive natural communities; loss or modification of federally protected wetlands; interference with animal movement/migration patterns; cumulative impacts to biological resources.

Cultural Resources: adverse changes to the significance of a historical resource; adverse change in the significance of archaeological resources, paleontological resources, unique geological features, or disturbances to human remains; degradation or loss of traditional cultural properties where Native American customs and traditions are practiced; cumulative impacts to cultural resources.

Geology: use of septic tanks or alternative wastewater disposal systems in unfit soils that may result in increased nutrients or other pollutants reaching and damaging groundwater resources.

Global Climate Change: increase in GHG emissions associated with 2030 General Plan buildout; increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions; cumulative impacts to global climate change.

Hazards and Hazardous Materials: projects located on a site that is included on a list of hazardous materials sites resulting in a significant hazard to the public or to the environment; projects located within an airport land use plan or within the vicinity of a public or private airport resulting in a safety hazard for people working or residing in the area.

Hydrology and Water Quality: depletion of groundwater supplies or interference with groundwater recharge; modification of surface water drainage patterns resulting in detrimental flooding or substantial erosion or siltation; cumulative impacts to hydrology and water quality.

Land Use Compatibility: physical division of an established community.

Mineral Resources: loss of mineral resources; and cumulative loss of mineral resources.

Noise: permanent increase in ambient noise levels; traffic noise level increases at existing sensitive uses caused by development consistent with the 2030 General Plan; exposure of people to, or generation of excessive groundborne vibration or groundborne noise levels; cumulative impacts to noise.

Population and Housing: inducement of population growth, directly or indirectly.

Transportation and Circulation: conflict with an applicable plan, ordinance or policy establishing measures of effectiveness of county roads, State Highways, or streets within incorporated cities in Merced County; increase hazards due to a design feature or incompatible uses; inadequate emergency access; conflict with policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or decrease the performance or safety of those facilities; cumulative impacts to transportation and circulation.

Utilities and Service Systems: sufficient water supply resources available to accommodate continued development through buildout of the 2030 General Plan; cumulative impacts to utilities and service systems.

Other CEQA Topics: cumulative impacts to growth inducement and irreversible environmental changes.

1.6 EIR ORGANIZATION

This Draft EIR is organized into fifteen chapters, each dealing with a separate aspect of the required content of an EIR as described in the State CEQA Guidelines. To help the reader locate information of particular interest, a brief summary of the contents of each section of the EIR is provided. The following sections are contained within the EIR:

Table of Contents: Provides a listing of content in the EIR, including environmental issue areas, appendices to support the EIR, tables and figures in the EIR, and a list of frequently used acronyms and abbreviations used in this EIR.

Chapter 1: Introduction provides an overview of the purpose of the EIR, the scope of this EIR, the environmental review process for the EIR and the proposed project, the general format of the document, and frequently used terms.

Chapter 2: Executive Summary contains a summary of environmental impacts, proposed mitigation, level of significance after mitigation, and unavoidable impacts. Also contained within this section are a summary description of project alternatives, potential cumulative impacts, and any areas of controversy regarding the proposed project known to the lead agency.

Chapter 3: Project Description defines the project location, summarizes components of the proposed project, outlines the project objectives, and describes the required approvals for the proposed project.

Chapter 4: Introduction to the Environmental Impact Report describes the framework of analysis contained in chapters 5 through 11 and includes project development standards required by the County. This chapter also contains a discussion of the relationship of the proposed project to the policies and procedures of the Merced County General Plan, the Merced County ACO, a chapter of the Merced County Zoning Code, and other provisions of the Merced County Zoning Code.

Chapters 5 through 11: These chapters describe and evaluate individual environmental issue areas, including the existing environmental setting and background, applicable environmental thresholds, environmental impacts associated with the project, policy considerations related to the particular environmental issue area under analysis, and mitigation measures to reduce environmental impacts.

Chapter 12: Required CEQA Analyses provides an analysis of the proposed project's potential growth-inducing and cumulative impacts, significant and unavoidable impacts, environmental effects of the project found not to be significant, and irreversible changes to the natural environment resulting from the proposed project.

Chapter 13: Alternatives Analysis analyzes feasible alternatives to the proposed project, including the No Project Alternative and any feasible project alternatives necessary to reduce or avoid identified significant project impacts.

Chapter 14: List of Preparers identifies all individuals responsible for the preparation of this report, including names of the EIR authors and consultants.

Chapter 15: References compiles a list of all documents used and persons, organizations, or agencies consulted in the preparation of this EIR.

Appendices set forth data supporting the analysis or contents of this EIR (such as the IS/NOP and technical studies).

1.7 FREQUENTLY USED TERMS

Implementation - This term implies that something is constructed and becomes operational, or becomes effective.

Project Site - The existing Hillcrest Dairy and the site of the proposed expansion are located on approximately 200 acres of an existing farm totaling approximately 2,290 acres in unincorporated Merced County. For the purposes of this EIR, the "project site" refers to the area of active dairy facilities. The project site is located west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area. For more information regarding the location and area of the project, see Chapter 3, *Project Description*.

Project Area - Throughout this document, “project area” refers to all parcels that are part of the project, including the active dairy facilities and associated cropland. This includes the ≈200 acres of active dairy facilities, the ≈1,611 acres of the project area that are currently used for the production of crops and the application of manure process water and/or solid manure, and the remaining project acres consisting of field roads and ancillary farm uses.

Less-than-Significant Impact - A less-than-significant impact is an impact that would not result in a substantial and adverse change in the environment and would not require mitigation.

Significant Impact - CEQA (PRC Section 21068) defines a significant impact as that which has “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project.” Levels of significance can vary by project, based on the change in the existing physical condition and the “...substantial body of opinion that considers or will consider the effect to be adverse...” The State CEQA Guidelines provide a list of consequences that would normally be regarded as having a significant effect on the environment. This EIR uses the CEQA definition of significant impacts together with the local environmental standards established by the County. Mitigation measures are proposed, when feasible, to reduce the magnitude of significant impacts.

Significant and Unavoidable Impact - A significant and unavoidable impact is one that would result in a substantial adverse effect on the environment which could not be mitigated to a less-than-significant level. A project could still proceed where significant and unavoidable impacts have been identified, but the County would then be required to prepare a Statement of Overriding Considerations, pursuant to State CEQA Guidelines Section 15093, that would explain why the County would proceed with the project despite the occurrence of the unavoidable impacts.

2 EXECUTIVE SUMMARY OF THE EIR

2.1 PROJECT SUMMARY

The existing Hillcrest Dairy is located on approximately 200 acres of 17 parcels totaling 2,290 acres in unincorporated Merced County. The dairy project site is located west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area of the County. Approximately 1,611 acres of the project site are currently used for the production of crops and application of manure process water.

Conditional Use Permit CUP20-013 proposes to expand the existing dairy so that the modified dairy would house 5,000 milk cows, 750 dry cows, and 3,300 support stock. This would represent an increase of 1,700 animals from existing numbers. The proposed project would include construction of one new freestall barn, one special needs barn, and three dry cow shade barns. Modification of the proposed facilities would occur within the existing footprint of the dairy, and there would be no change in cropped acreage associated with the farm.

2.2 SUMMARY OF PROJECT ALTERNATIVES

Section 15126.6 of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) describe and comparatively evaluate a range of reasonable alternatives to a project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. Thus, the range of alternatives evaluated in the following analysis is dictated by the range of significant impacts identified in this EIR, and evaluated alternatives are limited to those that would reduce or eliminate identified environmental impacts. As discussed in this EIR, the secondary and cumulative impacts of implementing the Hillcrest Dairy Expansion project would lead to significant adverse and unavoidable impacts. Accordingly, three alternatives in addition to the required No Project alternative, listed below, were formulated to illustrate the range of projects that could be implemented as an alternative to the proposed Hillcrest Dairy Expansion project.

- Alternative 1 – No Project Alternative
- Alternative 2 – On-Site Anaerobic Digester Alternative
- Alternative 3 – Dairy Digester Cluster Alternative
- Alternative 4 – Air Emissions Limited Herd Size

Based on the comparative evaluation contained in the EIR, other than the No Project Alternative, Alternative 4 – Air Emissions Limited Herd Size would reduce the magnitude of the most impacts. Several of the significant impacts identified for the project would be reduced, but not eliminated, with implementation of Alternative 4. Alternative 4 would be the environmentally superior alternative.

2.3 AREAS OF CONTROVERSY/ISSUES TO BE RESOLVED

The potential areas of controversy and issues to be resolved through the EIR process were derived from analysis conducted during preparation of the Notice of Preparation (NOP) (See Appendix A, *Notice of Preparation and Initial Study*), and review of responses received from public agencies and the public during circulation of the NOP. These areas are summarized as follows:

- Short-term construction air quality impacts and long-term air quality impacts from an increase in operational emissions, including generation of odors (see Chapter 5, *Air Quality and Odors*).
- Biological resources impacts from construction activities (see Chapter 6, *Biological Resources*).
- Cultural resources impacts from site clearing, grading, and other ground disturbing activities (see Chapter 7, *Cultural Resources and Tribal Cultural Resources*).
- Greenhouse gas emissions from direct and indirect sources (see Chapter 8, *Greenhouse Gas Emissions and Energy Use*).
- Potential generation of nuisance insects (see Chapter 9, *Nuisance Conditions from Insects*).
- Violation of water quality standards, depletion of groundwater, groundwater and surface water contamination, and impacts to water quality at off-site locations (see Chapter 10, *Hydrology and Water Quality*).
- Conflict with Merced County Zoning Code and Animal Confinement Ordinance requirements, and land use incompatibility with surrounding residences (see Chapter 11, *Land Use Compatibility*).

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table 2-1 presents a summary of project impacts and proposed mitigation measures that would avoid or minimize potential impacts. The level of significance for each environmental impact is indicated both before and after mitigation. For a detailed discussion of the proposed project impacts and mitigation measures, see Chapters 5 through 11 of the Draft EIR.

Table 2-1 Summary of Impacts and Mitigation Measures

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Air Quality and Odors (EIR Chapter 5)					
Impact AQ-1: Construction-related emissions		PS	Mitigation Measure AQ-1: The applicant shall provide a Dust Control Plan approved by the SJVAPCD to the County, and implement all measures of applicable SJVAPCD Rules and Regulations.	LS	
Impact AQ-2: Carbon monoxide emissions from operational equipment and increased traffic	LS		Mitigation Measure AQ-2: None required.	LS	
Impact AQ-3: Ozone precursor emissions from dairy operations, farm equipment, and increased traffic		PS	Mitigation Measure AQ-3a: The applicant shall implement all air quality provisions of the ACO, and implement BACT/BARCT mitigation measures appropriate for this dairy operation. Mitigation Measure AQ-3b: The applicant shall consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD.		SU
			Implementation of Alternative 1, No Project, would reduce the magnitude and significance of this effect.	LS	
			Implementation of Alternative 2, On-Site Anaerobic Digester, would potentially increase the magnitude but not the significance of this effect.		SU
			Implementation of Alternative 3, Dairy Digester Pipeline Cluster, would potentially increase the magnitude but not the significance of this effect.		SU
			Implementation of Alternative 4, Limited Herd Size, would reduce the magnitude and significance of this effect.	LS	
Impact AQ-4: PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS		Mitigation Measure AQ-4: None required.	LS	
Impact AQ-5: Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS		Mitigation Measure AQ-5: None required.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Impact AQ-6: Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS		Mitigation Measure AQ-6: None required.	LS	
Impact AQ-7: Adverse odor from project operations		PS	Mitigation Measure AQ-7a: The applicant has prepared an Odor Control Plan, which has been submitted to DEH. The applicant shall continue to implement all measures within the approved Odor Control Plan throughout the active life of the dairy. Mitigation Measure AQ-7b: The project applicant shall revise the Odor Control Plan to include all neighbors within the windshed and sensitive area setbacks to be provided with a point of contact for nuisance complaints at the dairy facility, and maintain a record of complaints received. Mitigation Measure AQ-7c: The applicant shall implement the nuisance control measures set forth in the Vector Control Plan and required in MM HAZ-1, which would also act to control odors.	LS	
Impact AQ-8: Conflict with or obstruct implementation of the applicable air quality plan	LS		Mitigation Measure AQ-8: None required.	LS	
Biological Resources (EIR Chapter 6)					
Impact BIO-1: Nest disturbance for Swainson's hawk		PS	Mitigation Measure BIO-1: 1. <i>Protocol Surveys:</i> A qualified biologist shall conduct protocol surveys if work begins between March 1 and August 30. Mitigate for loss of Swainson's hawk nesting habitat. 2. <i>Nest Avoidance:</i> Implement measures to minimize potential impacts to Swainson's Hawk nests.	LS	
Impact BIO-2: Disruption to nesting activities of sensitive and migratory bird species		PS	Mitigation Measure BIO-2a: Implement MM BIO-1, if necessary, which includes measures that would benefit other bird species. Mitigation Measure BIO-2b: Implement measures to reduce project-related impacts to active bird nests and to reduce the potential for construction activities to interrupt breeding and rearing behaviors of birds.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Impact BIO-3: Disruption to nesting activities for tricolored blackbird		PS	Mitigation Measure BIO-3a: Implement MM BIO-1, if necessary, which includes measures that would benefit other bird species. Mitigation Measure BIO-3b: Implement measures as set forth in MM BIO-2b. Mitigation Measure BIO-3c: If a TCBB nest colony is discovered during preconstruction surveys, CDFW will be consulted to determine the appropriate actions or required mitigation.	LS	
Cultural Resources and Tribal Cultural Resources (EIR Chapter 7)					
Impact CUL-1: Cause a substantial adverse change in the significance of an archaeological resource		PS	Mitigation Measure CUL-1: The project applicant and construction contractor shall implement a plan to address discovery of unanticipated cultural resources. If any features are discovered, work shall be suspended until a qualified archaeologist assesses the discovery and provides consultation with appropriate agencies. Appropriate mitigation shall be implemented as advised.	LS	
Impact CUL-2: Result in the accidental discovery and disturbance of human remains		PS	Mitigation Measure CUL-2a: The project applicant and construction contractor shall implement the plan to address discovery of unanticipated cultural resources set forth in MM CUL-1. Mitigation Measure CUL-2b: The project applicant and construction contractor shall implement a plan to address discovery of human remains. In the event human remains are discovered, no further disturbance shall occur until the county coroner has made the necessary findings as to the origin and disposition of the remains, and notified the appropriate parties.	LS	
Impact CUL-3: Cause a substantial adverse change in the significance of a tribal cultural resource	LS		Mitigation Measure CUL-3: None required.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Greenhouse Gas Emissions and Energy Use (EIR Chapter 8)					
Impact GHG-1: Greenhouse gas emissions from project construction and operation		PS	Mitigation Measure GHG-1a: Implement Mitigation Measure AQ-3a, which requires implementation of all air quality provisions of the ACO and compliance with SJVAPCD Rules, several of which would also act to reduce methane emissions. Mitigation Measure GHG-1b: Prior to the issuance of a building permit, the project sponsor shall implement Alternative 2, Alternative 3, or Alternative 4 in Chapter 13, <i>Alternatives Analysis</i> , of this EIR, should they be determined to be feasible. This would include modification of the existing waste management system with construction of a dairy digester on the project site, as described in the Alternatives Chapter.		SU
			Implementation of Alternative 1, No Project, would reduce the magnitude and significance of this effect.	LS	
			Implementation of Alternative 2, On-Site Anaerobic Digester, would potentially increase the magnitude but not the significance of this effect.	LS	
			Implementation of Alternative 3, Dairy Digester Pipeline Cluster, would potentially increase the magnitude but not the significance of this effect.	LS	
			Implementation of Alternative 4, Limited Herd Size, would reduce the magnitude but not significance of this effect.		SU
Impact GHG-2: Wasteful or inefficient consumption of energy	LS		Mitigation Measure GHG-2: None required.	LS	
Impact GHG-3: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS		Mitigation Measure GHG-3: None required.	LS	
Nuisance Conditions from Insects (EIR Chapter 9)					
Impact HAZ-1: Increased fly production and related nuisance effects		PS	Mitigation Measure HAZ-1: The applicant has prepared a Vector Control Plan, which has been submitted to DEH. The applicant shall continue to implement all measures within the approved Vector Control Plan throughout the active life of the dairy.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure / Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Impact HAZ-2: Create significant nuisance conditions due to increased mosquito production	LS		Mitigation Measure HAZ-2: None required.	LS	
Hydrology and Water Quality (EIR Chapter 10)					
Impact HYD-1: Degradation of water quality due to storm water runoff during project construction		PS	Mitigation Measure HYD-1: The project applicant shall Submit permit registration documents for the Construction General Permit Order 2009-0009-DWQ to the SWRCB, and comply with all requirements of the permit.	LS	
Impact HYD-2: Degradation of surface water quality from project operations	LS		Mitigation Measure HYD-2: None required.	LS	
Impact HYD-3: Groundwater contamination from project operations		PS	Mitigation Measure HYD-3a: The project applicant shall implement BMPs to prevent contamination of groundwater.	LS	
			Mitigation Measure HYD-3b: The applicant shall comply with requirements of the NMP/WMP, the individual WDR, and all Merced County ACO requirements not superseded by the conditions of the individual WDR.		
			Mitigation Measure HYD-3c: The project applicant shall apply liquid and solid manure to not exceed agronomic rates as set forth in the NMP, and shall confirm agronomic rates with soil testing as described in the NMP.		
			Mitigation Measure HYD-3d: The applicant shall comply with the permit requirements to protect surface waters and groundwater from salts in wastewater, to be issued by the CVRWQCB as set forth in Board Resolution R5-2018-0034.		
			Mitigation Measure HYD-3e: The project applicant shall maintain continued membership in the groundwater monitoring network or contribute to additional monitoring requirements of the individual WDR issued for the facility.		

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
			Mitigation Measure HYD-3f: The project applicant shall continue groundwater monitoring of the on-site domestic and irrigation wells. A well monitoring schedule shall be incorporated into the WDR issued for the facility.		
			Mitigation Measure HYD-3g: After monitoring, if groundwater contamination is shown, the project applicant may be required to submit a new ROWD to the CVRWQCB. The ROWD shall clearly demonstrate that the herd size will not constitute a threat to groundwater quality. If necessary, the CVRWQCB shall revise the WDR issued to the facility.		
			Mitigation Measure HYD-3h: The Department of Community and Economic Development and the DEH shall make a final inspection of the facility to confirm the dairy meets local and state requirements.		
			Mitigation Measure HYD-3i: During construction, all soils that contain manure or process water residue shall be maintained on the project site.		
Impact HYD-4: Decrease groundwater supplies	LS		Mitigation Measure HYD-4: None required.	LS	
Impact HYD-5: Modification of surface water drainage patterns and an increase in runoff	LS		Mitigation Measure HYD-5: None required.	LS	
Impact HYD-6: Water supply pathways for pollutant migration	LS		Mitigation Measure HYD-6: None required.	LS	
Impact HYD-7: Impacts to water quality at off-site locations as a result of project operations		PS	Mitigation Measure HYD-7: The project applicant shall obtain written agreement from the recipients of manure exported off site, and provide the most recent analysis of the dry manure, in writing, to the manure recipient.	LS	
Impact HYD-8: Potential selenium and heavy metals effects to on-site biological resources	LS		Mitigation Measure HYD-8: None required.	LS	
Impact HYD-9: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan	LS		Mitigation Measure HYD-9: None required.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Land Use Compatibility (EIR Chapter 11)					
Impact LU-1: Consistency with Merced County Land Use Plans and policies adopted to protect the environment, including setback standards	LS		Mitigation Measure LU-1: None required.	LS	
Impact LU-2: Land use compatibility with existing off-site residential uses adjacent to the project area		PS	Mitigation Measure LU-2a: Implement the odor control measures set forth in Mitigation Measures AQ-7a and AQ-7b. Mitigation Measure LU-2b: Implement the nuisance control measures set forth in Mitigation Measures HAZ-1.	LS	
Cumulative Impacts					
Aesthetics	LS		No cumulatively considerable contribution.	LS	
Agricultural Resources	LS		No cumulatively considerable contribution.	LS	
Air Quality		PS	The project would have a cumulatively considerable contribution.		SU
Biological Resources	LS		No cumulatively considerable contribution.	LS	
Cultural Resources	LS		No cumulatively considerable contribution.	LS	
Geological Resources	LS		No cumulatively considerable contribution.	LS	
Greenhouse Gas Emissions	LS	PS	The project would have a cumulatively considerable contribution.		SU
Hazards (Nuisance Insects)	LS		No cumulatively considerable contribution.	LS	
Hydrology and Water Quality		PS	The project would have a cumulatively considerable contribution.		SU
Land Use	LS		No cumulatively considerable contribution.	LS	
Mineral Resources	LS		No cumulatively considerable contribution.	LS	
Noise	LS		No cumulatively considerable contribution.	LS	
Population and Housing	LS		No cumulatively considerable contribution.	LS	
Public Services	LS		No cumulatively considerable contribution.	LS	
Recreation	LS		No cumulatively considerable contribution.	LS	
Transportation and Circulation	LS		No cumulatively considerable contribution.	LS	
Utilities and Service Systems	LS		No cumulatively considerable contribution.	LS	
Growth Inducement and Secondary Effects	LS		None required.	LS	

Environmental Impact	Level of Significance Before Mitigation		Summary of Mitigation Measure/Alternative	Level of Significance After Mitigation	
	LS	PS		LS	SU
Irreversible Commitment of Resources	LS		None required.	LS	
Potential Environmental Damage from Accidents	LS		None required.	LS	

LS = Less than significant impact; PS = Potentially significant impact with mitigation; SU = Significant and unavoidable impact

3 PROJECT DESCRIPTION

3.1 ENVIRONMENTAL SETTING

3.1.1 PROJECT LOCATION

The existing Hillcrest Dairy is located on approximately 200 acres of 17 parcels totaling 2,290 acres in unincorporated Merced County. The dairy project site is located west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area of the County. The project's location is within the central California region (see Figures 3-1 and 3-2). The active dairy facilities are located on portions of Merced County Assessor's Parcel Numbers (APN) 053-100-042 and -043. The entirety of the project is located on several parcels identified in Table 3-1 below and shown on Figure 3-3. The dairy project site is located in Sections 11, 14 (Section of active dairy facilities), 15, 22, 23, 26, and 27, Township 7 South, Range 15 East, Mount Diablo Base and Meridian; 37°18'46.52"N, 120°18'31.82"W.

Table 3-1 Hillcrest Dairy Project Parcels, Acreage, and Use				
APN	Field ID	Acres	Crops Grown	Nutrients Applied***
053-080-045	1	59	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-080-045	2	9	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-080-045	3	33	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-080-044, 045	4	76	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-100-069	5	35	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-100-069	6	57	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-100-042	7	13	Wheat/Corn	Wastewater/Solid Manure
053-100-042	10	67	Pistachio*	None
053-100-042	11	21	Pistachio*	None
053-100-043	12	93	Corn/Sorghum Sudan	Wastewater/Solid Manure
053-100-043	13	79	Wheat/Corn	Wastewater/Solid Manure
053-100-043	14	74	Wheat/Corn	Wastewater/Solid Manure
053-100-043	15	78	Wheat/Corn	Wastewater/Solid Manure
053-100-044	16	50	Wheat/Corn	Wastewater/Solid Manure
053-110-006	17	28	Wheat/Corn	Wastewater/Solid Manure
053-150-033	18	50	Wheat/Corn	Wastewater/Solid Manure
053-150-033	20 N	37	Wheat/Corn	Wastewater/Solid Manure
037-040-003 053-150-033	20 S	43	Pistachio*	None
053-150-033	21	15	Wheat/Corn	Wastewater/Solid Manure
053-150-006	22	115	Wheat/Corn	Wastewater/Solid Manure
037-040-003	23	27	Pistachio*	None
037-040-004 053-150-032	24 E	81	Wheat/Corn	Wastewater/Solid Manure
037-040-003	24 W	16	Pistachio*	None
053-150-006	25**	91	Wheat/Corn	Wastewater/Solid Manure

Table 3-1 Hillcrest Dairy Project Parcels, Acreage, and Use

APN	Field ID	Acres	Crops Grown	Nutrients Applied***
053-150-006	26**	74	Wheat/Corn	Solid Manure
053-100-065 053-100-047	28	57	Pistachio*	None
053-100-065	29	130	Pistachio*	None
053-100-047	30	103	Pistachio*	None
Total Acres		1,611		

APN = Assessor's Parcel Number

* Mico Jet Drip irrigation is used for fields planted in pistachio and do not receive wastewater or solid manure.

** Information on Field 25 and 26 in the Nutrient Management Plan has been updated by the project applicant. Field 25 has been improved with a tailwater return system and receives wastewater. There are control valves in place on Field 26 to prevent discharge off field to Miles Creek following manure applications.

*** Nutrients may not be applied to the entire acreage of the parcel listed; application acreage included in Nutrient Management Plan dated 10/22/2019.

Source: Application Materials, 2020. Project Applicant, April 2021; Existing Conditions Nutrient Management Plan 10/22/2019.

3.2 EXISTING CONDITIONS

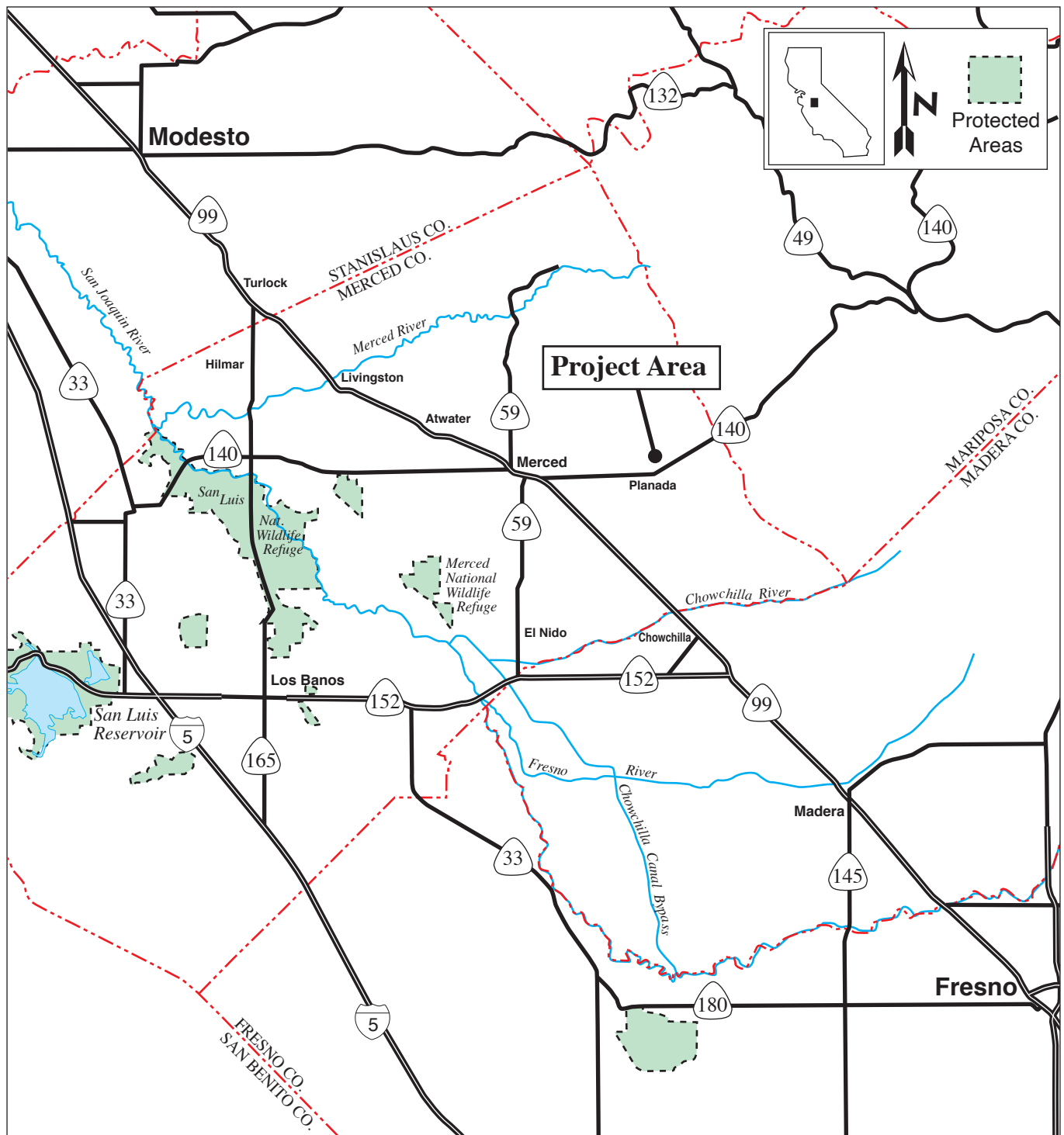
The existing animal confinement facility is located on ≈ 200 acres of the 2,290-acre project site. The existing facilities include the following (with approximately 622,280 square feet of structures):

- twin pit milking parlor
- commodity barn
- 2 settling basins
- feed storage slab
- solid manure stacking area
- 4 freestall barns and corrals
- 3 dry cow/special needs/maternity barns
- 3 wastewater storage ponds
- 4 mechanical manure separators and pits
- sand trap

Approximately 1,611 acres of the project area are currently used for the production of crops, including forage crops and pistachios; however, only 1,147 acres of this cropland currently receives manure process water and/or solid manure. Approximately 464 acres of cropland are planted in pistachios, and do not receive solid or liquid manure. The pistachios are not used as feed for the dairy herd. The remaining farm acreage consist of on-site roadways and ancillary uses to the dairy, in addition to two on-site residences. As shown in Figure 3-2, project area cropland is immediately adjacent to the Planada community to the south.

Definition of the Project Site – For the purposes of this Environmental Impact Report, the “project site” refers to the area of active dairy facilities. The larger project also includes cropland associated with the dairy farm. Throughout this document, “project area” refers to all parcels that are part of the project, including the active dairy facilities and associated cropland.

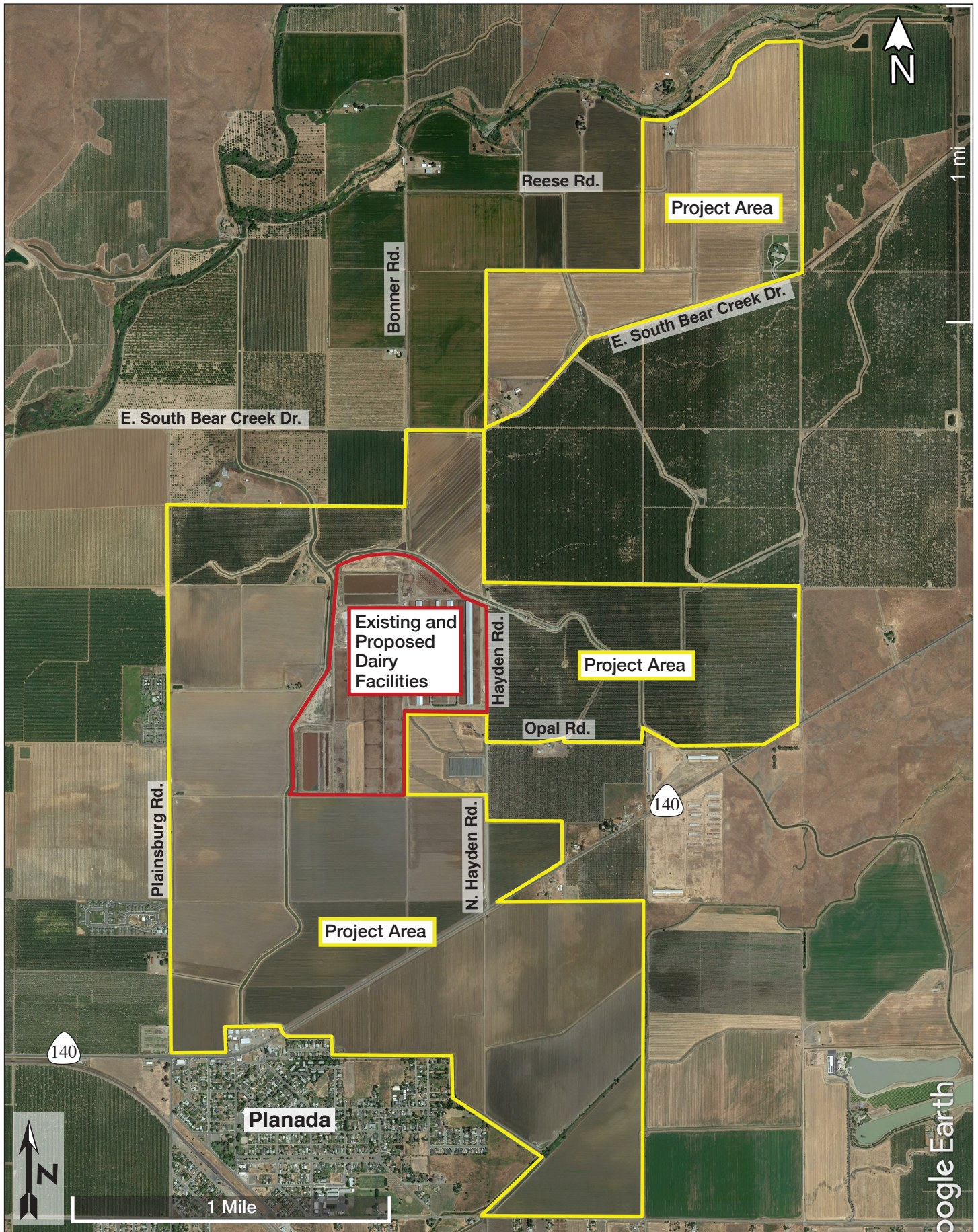
As established at the time of the Notice of Preparation (September 2021), there are approximately 8,050 animals at the dairy, including 4,000 milk cows, 750 dry cows, 1,400 bred heifers (15-24 months), 500 heifers (7-14 months), and 1,400 calves (4-6 months). The predominant breed of cows housed at the dairy is Holstein.



Hillcrest Dairy Expansion Project CUP20-013

SOURCE: Planning Partners 2021

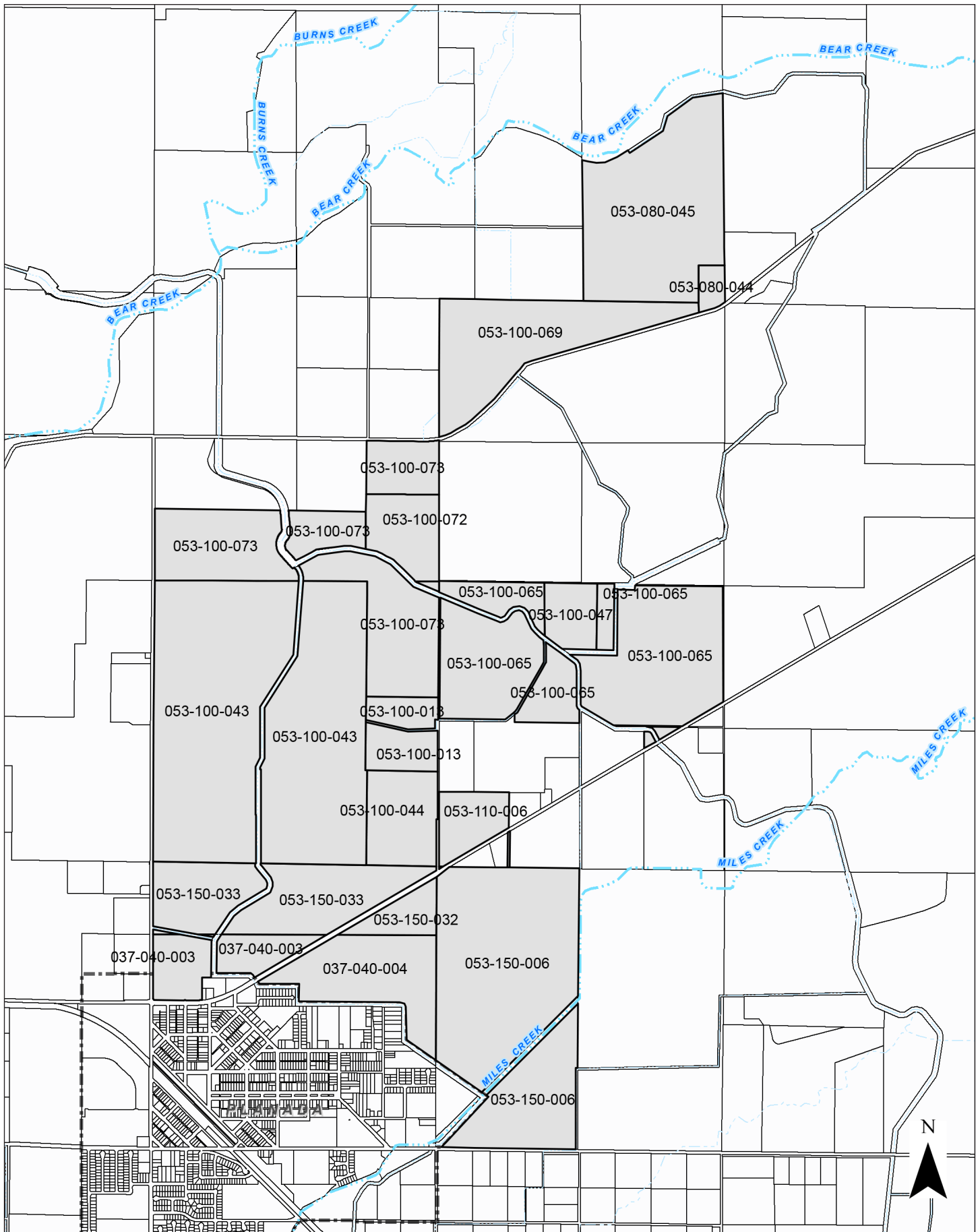
Figure 3-1
Regional Location



Hillcrest Dairy Expansion Project CUP20-013

SOURCE: Planning Partners 2021

Figure 3-2
Project Vicinity



SOURCE: Merced GIS 2021

Hillcrest Dairy Expansion Project CUP20-013

Figure 3-3

Project Site Merced County Assessor Parcel Numbers

The existing facility consists of flush and scrape systems that are used to collect and process wastewater and solid manure. Animal wastes from freestall and other concrete-surfaced areas are flushed to an on-site waste management system that consists of two settling basins, three wastewater storage ponds, and a sand trap with four mechanical separators. All ponds are earthen-lined. The area of active dairy facilities has been graded to direct corral runoff to the existing waste management system. Stormwater runoff from impervious surfaces and roofed areas is routed to the wastewater ponds, except for stormwater from the milking parlor, which is routed to a yard. Recycled water is used to clean the milk parlor floor and is the source of sprinkler pen water.

Domestic water to the site and dairy barns is provided by three on-site water wells. Irrigation water is supplied by surface water sources from Merced Irrigation District (MID) canals, MID groundwater wells, and seven (7) irrigation wells. Wastewater is mixed with irrigation water and applied to cropland. For fields receiving wastewater and/or solid manure, collected tailwater is recycled and returned to the top of field, returned to the tailwater pond for reuse, or drained through the adjacent field to the tailwater pond. The dairy facility uses both surface water and groundwater resources for farm operations.

Corrals are scraped at least two times per year, usually in the spring or fall after harvest. Solid manure currently is stockpiled in windrows in the manure stacking area. Some of the solid manure is used as bedding (consisting of dry manure, almond shells, and rice hulls), applied on the project site, or hauled offsite to fields in the project vicinity. Dry manure is applied to dairy cropland using calibrated spreader trucks with manure incorporated into the soil within 24 hours of application. There is no manure composting onsite. Manure solids are separated from liquids with a sand trap and four mechanical separators combined with two solid separation basins. As reflected in the Nutrient Management Plan (NMP), approximately 19,998 tons of solid manure (or approximately 617,438 pounds of nitrogen) (approximately 70-75 percent of the dry manure generated at the dairy) is exported and applied to off-site fields not owned by the dairy operator.

While the Hillcrest Dairy has previously used individual groundwater monitoring wells, because three of the six monitoring wells have insufficient water for sampling, the Hillcrest Dairy joined the Central Valley Dairy Representative Monitoring Program (CVDRMP) in 2019. The CVDRMP has established a regional groundwater monitoring plan for member dairies in order to monitor groundwater quality and evaluate impacts from management practices.

Some of the crops grown on site provide animal feed for the dairy, and supplement imported grain and hay. Crops include corn, sorghum sudan, wheat, and corn. Feed is stored adjacent to wastewater storage pond (WWS) 1 in silage piles and a commodity barn. Pistachios are also grown within the project area, but this crop does not provide animal feed.

The Hillcrest Dairy uses a larvicide as a feed additive for fly control at the dairy, in addition to housekeeping measures to address potential fly problems. There is a 900-gallon gasoline storage tank on site. Hazardous materials used in dairy operations are stored at the dairy barn and shop. There is one permitted diesel generator on site. As reported by DEH, the facility has a current Hazardous Materials Business Plan (HMBP).

There are two residences located at the Hillcrest Dairy facility. One is the owner's residence, and the other residence is occupied an employee and their family. Domestic water is delivered to the site by three on-site water wells. Sewer service is provided by existing on-site septic systems. The dairy barn has two separate bathrooms available to all employees.

Operations at the dairy are 24 hours per day, 365 days per year, with most operations concentrated during daylight hours. Activity on the site peaks in the spring and fall when feed crops from adjacent cropland areas are being harvested and corrals are being cleaned. The dairy currently employs a staff of approximately 50 workers. There can be as many as 40 employees on site at any one time but more typically 30-35 employees. Night lighting at the facility includes LED lighting on cow housing and the milking parlor.

The milking parlor uses commercial milking equipment, piping, storage tanks, and cooling equipment to prepare the milk for multiple daily tanker truck visits. Other equipment used on site include tractors and trucks for preparing and distributing feed to the herd. Stationary equipment includes pumps for water, wastewater, and irrigation water supply and distribution.

Currently, the site is served by heavy trucks (milk tankers, commodity deliveries), and other vehicles. Existing daily trips by all classes of vehicle are estimated at 105 average daily trips (ADT), with approximately 20 heavy truck trips (see Table 3-4 below). All trips currently access North Hayden Road by private driveway. Regional access is provided by Highway 140.

The project site is located within Flood Zone X, which is defined as an area with an annual flooding probability of 0.2 percent. Thus, the project site is outside of the 100-year flood zone.

3.3 SURROUNDING LAND USES AND SETTING

There are off-site single-family residences associated with neighboring agricultural operations located on parcels to the north, south, east, and west of the project site. There is one off-site residence located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility) (see Figure 3-4). Table 3-2 lists the immediate surrounding land uses and corresponding General Plan and zoning designations to the Hillcrest Dairy active animal confinement facilities.

Table 3-2 Surrounding Land Uses at the Hillcrest Dairy Facility			
Location	Land Use	General Plan	Zoning
ON SITE	Dairy / Irrigated agriculture / 2 residences	A (Agricultural)	A-1 (General Agricultural) A-2 (Exclusive Agricultural)
NORTH	Agriculture / rural residences	A (Agricultural)	A-2 (Exclusive Agricultural)
EAST	Agriculture / rural residences / Hwy 140	A (Agricultural)	A-1 (General Agricultural)
SOUTH	Agriculture / Hwy 140 / community of Planada	A (Agricultural)	A-1 (General Agricultural)
WEST	Agriculture / rural residences / farm labor camps	A (Agricultural)	A-1 (General Agricultural)

Source: Application Materials; Project Site Visit, April 13, 2021; Merced County GIS 2021.



SOURCE: Planning Partners 2021

Hillcrest Dairy Expansion Project CUP20-013

Figure 3-4
Active Dairy Facilities and Nearby
Residences Located in the Windshed

The Hillcrest Dairy facility is situated approximately 0.73 miles (3,855 feet) north of the urban community of Planada. There are two farm labor housing facilities located in the vicinity of the Hillcrest Dairy along North Plainsburg Road. The nearest farm labor housing facility is located approximately 0.40 miles (2,125 feet) west of active dairy facilities; another farm labor housing facility is located approximately 0.52 miles (2,770 feet) southwest of active dairy facilities. Bear Creek is located approximately one mile north of project site active dairy facilities. Miles Creek is located approximately one mile south of active dairy facilities and just east of Planada.

Project details such as adjacent land uses and cropping patterns could change over the course of evaluation, and from those existing at the time of this Environmental Impact Report. These changes, however, would consist of agricultural and ancillary uses consistent with the 2030 Merced County General Plan, and would not affect the analysis contained in this Environmental Impact Report.

3.4 GOALS AND OBJECTIVES OF THE PROJECT APPLICANT

As required by California Environmental Quality Act (CEQA) Guidelines Section 15124(b), the following is a discussion of the project applicant's objectives in proposing the Hillcrest Dairy Expansion project. The applicant has identified the following goals in proposing the project:

- To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.
- To fully use land and facilities currently owned and operated by the project applicant without the need to purchase additional land.
- To use all available land (which is not otherwise used for the dairy) for the production of feed for the herd. This allows for the application, at appropriate agronomic rates, of dairy process water from dairy operations, which in turn reduces the need for imported fertilizers.
- To generate dry manure that can be land applied and/or sold as a commodity for use as fertilizer in the region.
- To construct improvements that could be permitted within a reasonable time frame and would represent commensurate benefit with cost.
- To provide year-round employment opportunities, at competitive wages, for Merced County residents. Unlike other agricultural operations, which provide only seasonal employment, dairies provide year-round employment.

3.5 DESCRIPTION OF THE PROPOSED ACTION

The project sponsor has applied for a new Conditional Use Permit (CUP20-013) from Merced County to modify and expand the existing dairy to house 4,000 milk cows, 750 dry cows, and 3,300 support stock (see Table 3-3). Considering the existing animals at the dairy facility, the proposed expansion would represent an increase of 1,700 animals from existing numbers.

Table 3-3 Existing and Proposed Herd at the Hillcrest Dairy

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo.)	Calves (4-6 mo.)	Calves (0-3 mo.)	Total Animals
Existing	4,000	750	1,400	500	1,400	0	8,050
Proposed	5,000	750	1,625	1,625	750	0	9,750
<i>Change</i>	<i>1,000</i>	<i>0</i>	<i>225</i>	<i>1,125</i>	<i>-650</i>	<i>0</i>	<i>1,700</i>

Note: This evaluation considers maximum buildout.

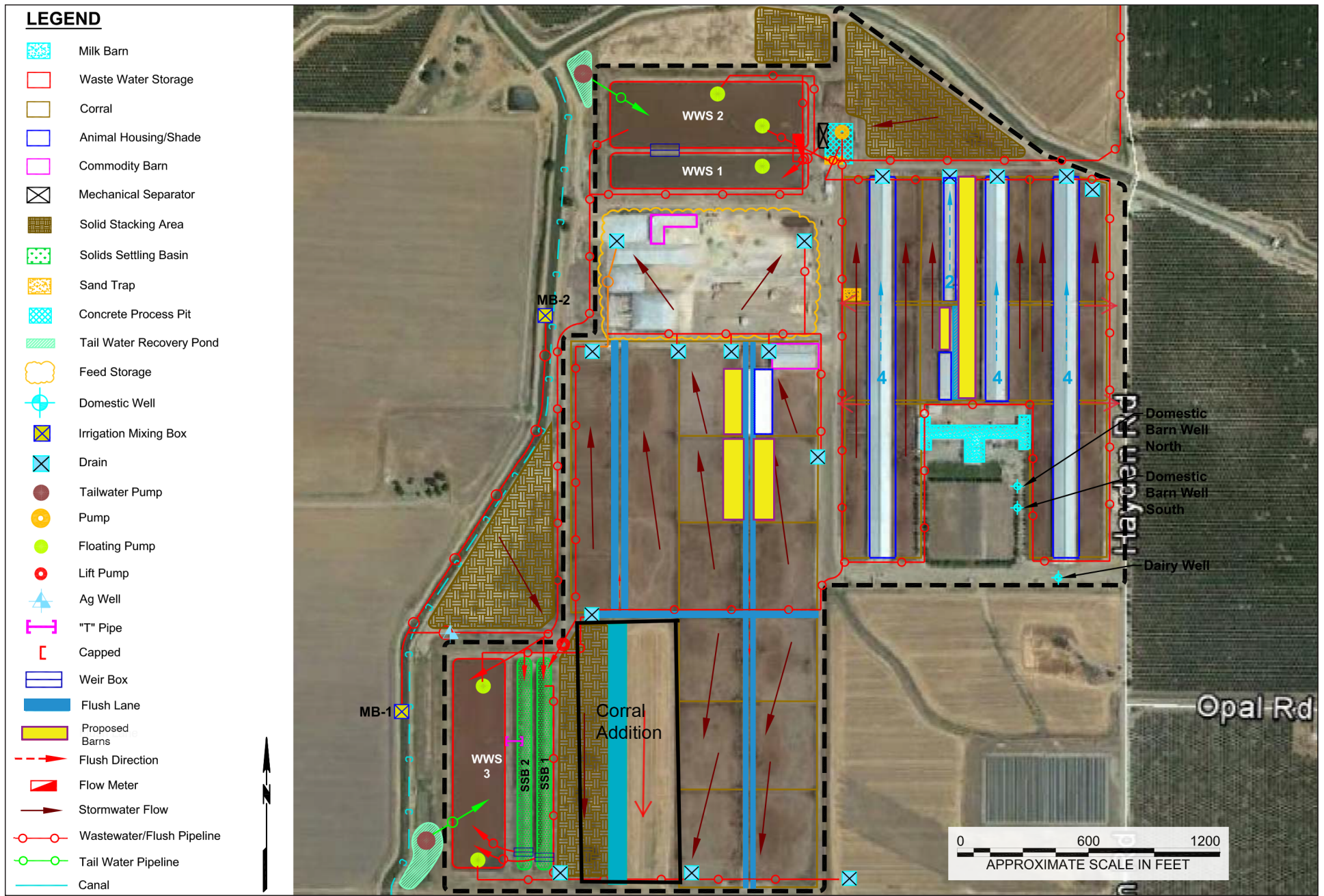
Source: Existing Conditions Nutrient Management Plan (10/22/2019); Proposed Conditions Nutrient Management Plan (08/04/2020).

The proposed project would include the construction of one new freestall barn measuring 50,000 square feet, one maternity barn measuring 13,678 square feet, three dry cow shade barns measuring 44,000 square feet each, and open heifer corrals to house 700 support stock. Proposed improvements would add approximately 195,678 square feet of new structures. See Figure 3-5 for the proposed dairy site plan. Modification of the proposed facilities would occur within the existing footprint of the dairy, and there would be no change in cropped acreage associated with the farm. See Figures 3-6a and 3-6b for the layout of the dairy fields. Crops grown on site would continue to be used for dairy feed crops and supplement imported grain and hay. Cropping patterns would be unchanged with the proposed dairy expansion.

The closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road. With the proposed dairy expansion, distances to this residence would not be reduced (see Figure 3-7). Similarly, the existing distance of 0.73 miles (3,855 feet) between active dairy facilities and the urban community of Planada would not be reduced with the proposed dairy expansion. Hillcrest dairy cropland immediately north of Planada would continue to be cropped with pistachio and wheat and corn.

Animal wastes from freestall and other concrete-surfaced areas would continue to be flushed to the existing on-site waste management system, except for solid manure within corral areas, which would continue to be scraped. Liquid manure would continue to be directed to the solid settling basins and wastewater storage ponds.

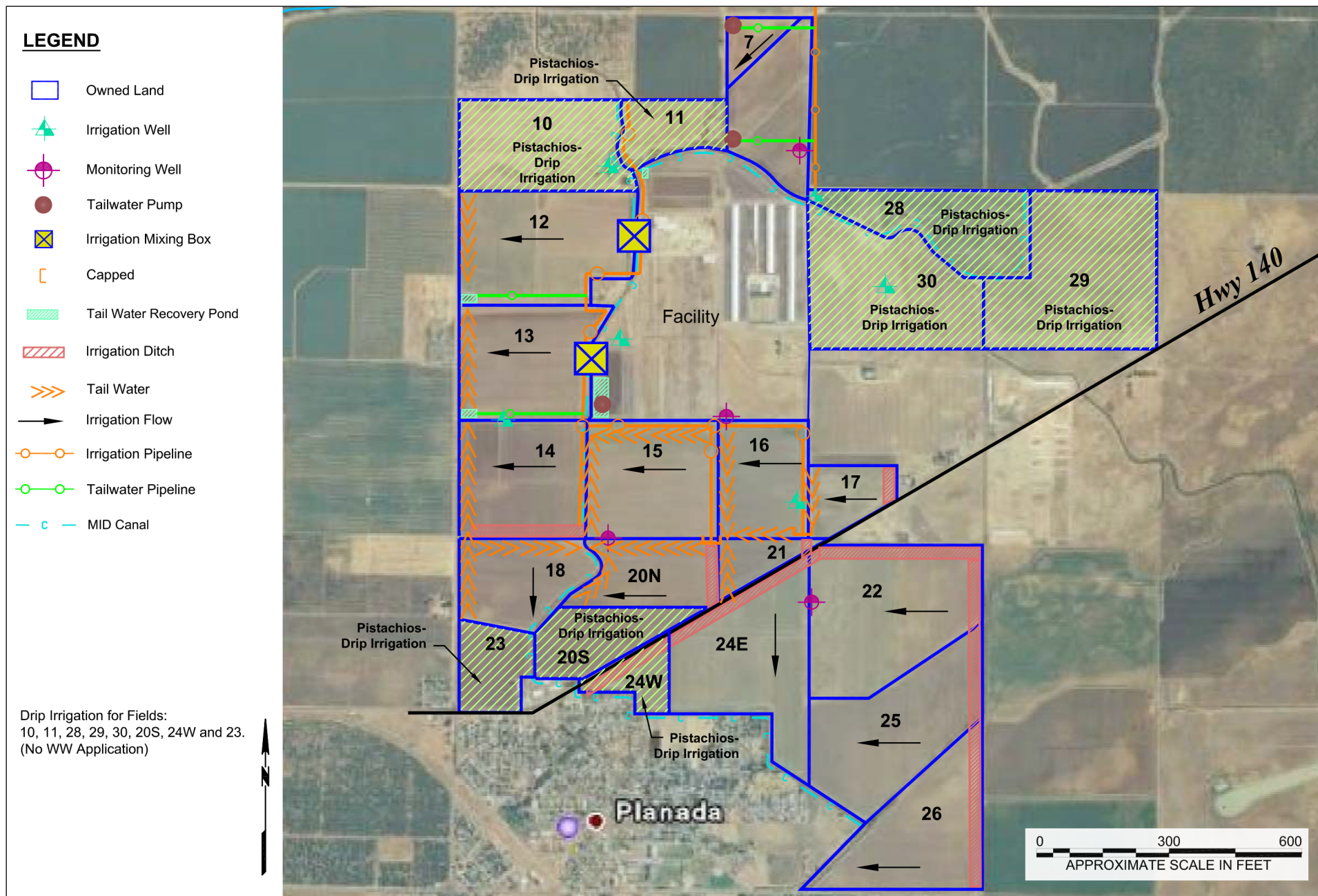
Stormwater runoff from impervious surfaces and roofed areas would continue to be routed to the wastewater pond, except for stormwater from the milking parlor, which is routed to a yard. Wastewater would continue to be mixed with irrigation water and applied to the fields.



SOURCE: FR Ag Services, Inc. 2019

Hillcrest Dairy Expansion Project CUP20-013

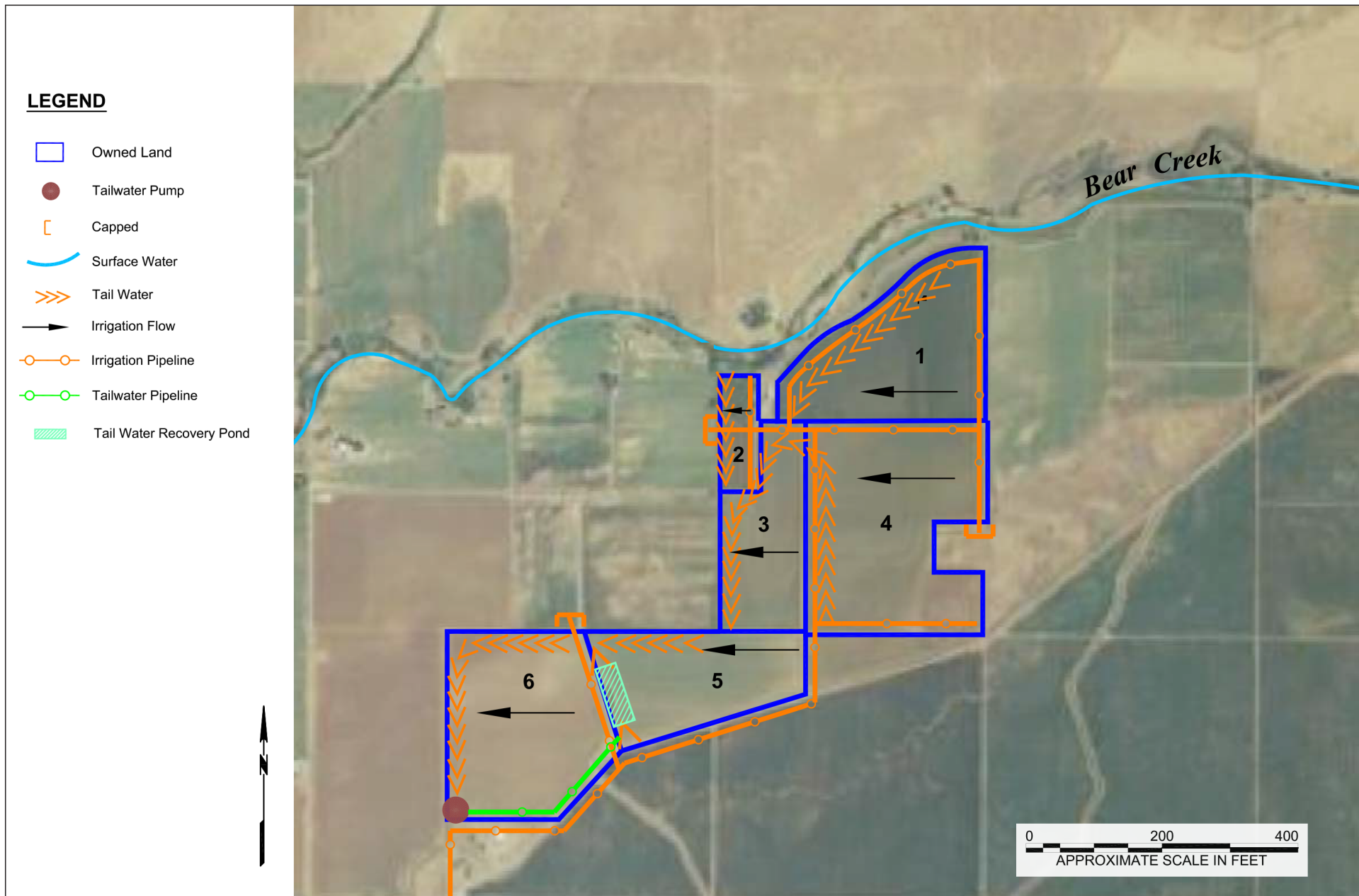
Figure 3-5
Proposed Dairy Facilities



SOURCE: FR Ag Services, Inc. 2019

Hillcrest Dairy Expansion Project CUP20-013

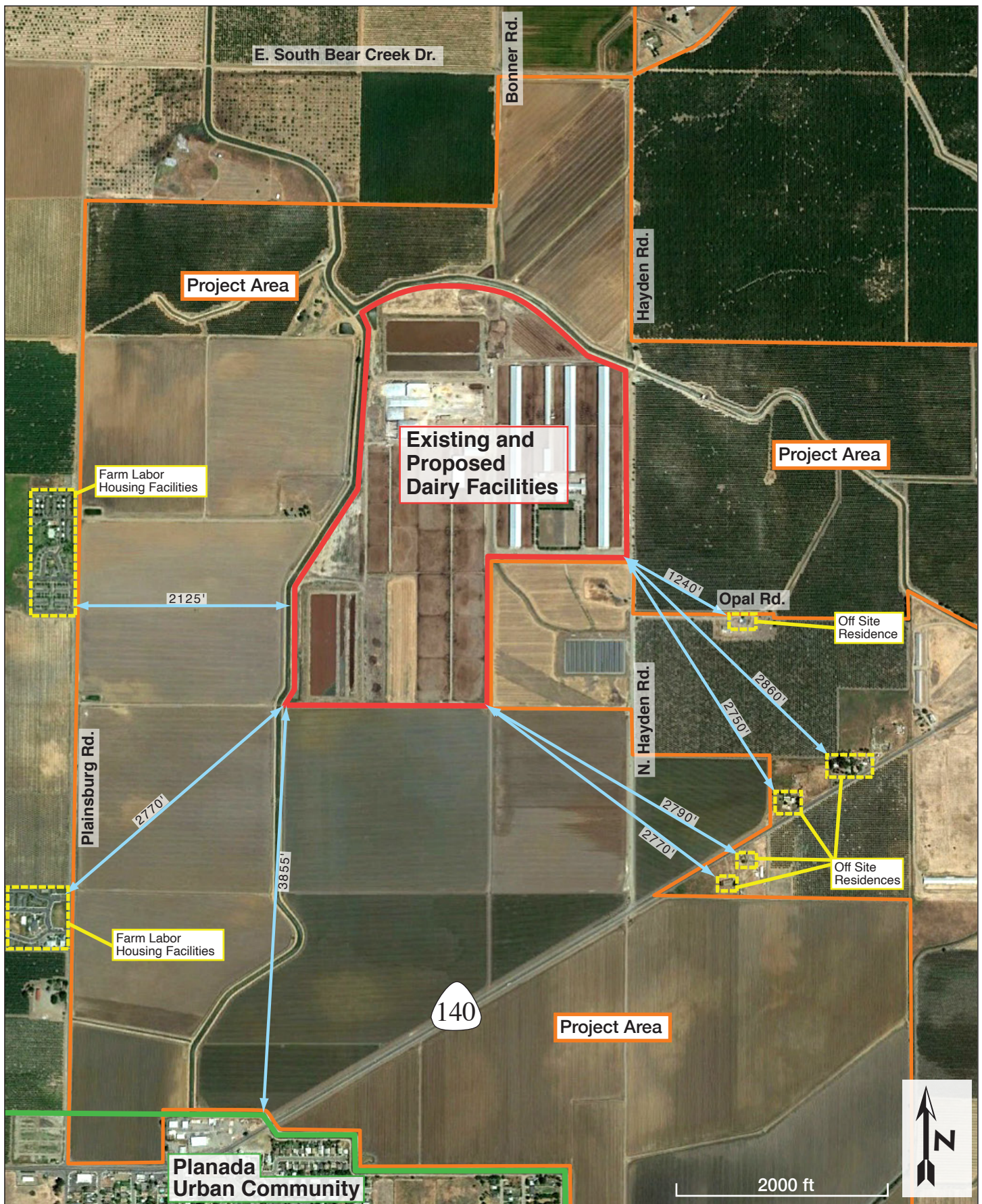
Figure 3-6a
Dairy Fields - South



SOURCE: FR Ag Services, Inc. 2019

Hillcrest Dairy Expansion Project CUP20-013

Figure 3-6b
Dairy Fields - North



Hillcrest Dairy Expansion Project CUP20-013

SOURCE: Planning Partners 2021

Figure 3-7

Distance of Nearest Off-Site Residences to Existing and Proposed Active Dairy Facilities

Solid manure that accumulates within corrals would continue to be scraped. Dry manure, almond shells, and rice hulls would continue to be used for bedding; additional manure would be sold and hauled offsite for use as fertilizer and soil amendments. As reported in the NMP, exported solid manure applied to off-site agricultural fields not owned by the project applicant would increase from 19,998 tons of solid manure from the dairy facility to 33,198 tons of solid manure¹ with the proposed expansion (increasing from approximately 70-75 percent under existing conditions to 75-80 percent of previously separated solids under proposed conditions). While the exact location of these off-site cropland parcels may vary throughout operations, the disposal of manure at off-site locations and the acreage necessary to properly dispose of manure liquids and solids are accounted for in the project NMP. Figure 3-8 shows a cross-section of a freestall dairy barn and Figure 3-9 illustrates the processes that occur at a dairy farm.

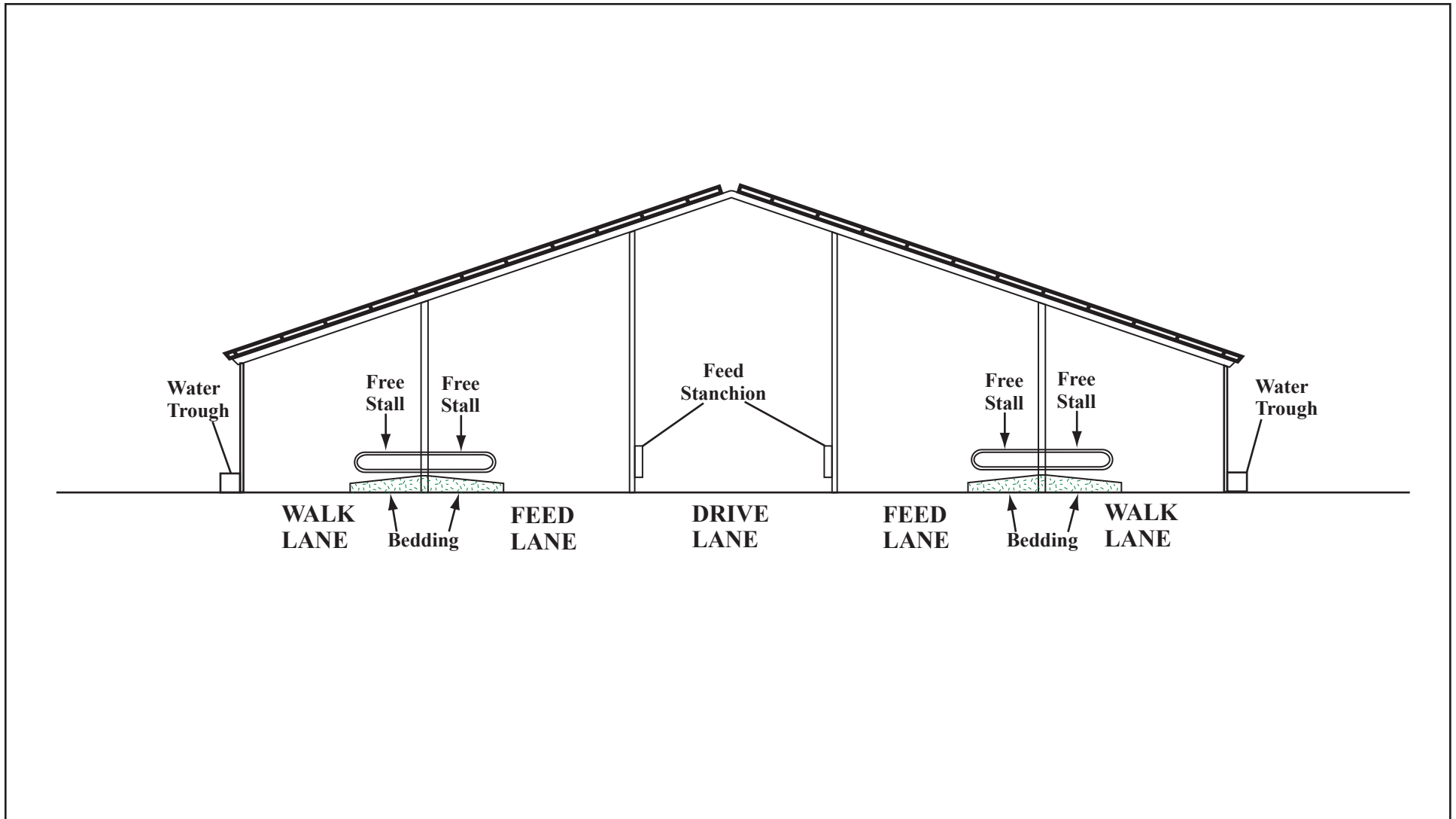
The dairy facility uses and stores diesel fuel, motor oil, hydraulic oil, and other petroleum products associated with the operation of heavy equipment. The dairy facility also uses and stores cleaning and maintenance materials that may be categorized as hazardous. The HMBP prepared for this facility has been updated to reflect the types and quantities of these materials.

The proposed dairy expansion would rely on existing utilities, including domestic water, stormwater, and electrical services. The project includes new LED lighting on the proposed barns. All lighting on the proposed open corral addition would be directed into the corrals to limit the potential for glare offsite.

Operations at the dairy would continue to occur 24 hours per day, 365 days per year, with most operations concentrated during daylight hours. With implementation of the proposed project, the number of employees would remain at 50 workers. With the proposed improvements, no change in the peak number of employees on site at a given time is anticipated.

The project applicant has prepared an Odor Control Plan and Vector Control Plan in accordance with ACO Chapter 18.64.060(C)(8). As part of the Odor Control Plan, the dairy operator will provide a point of contact to residents within the windshed of the dairy should nuisance odors occur. The dairy operator will respond to neighbors who are adversely affected by odors and take corrective action.

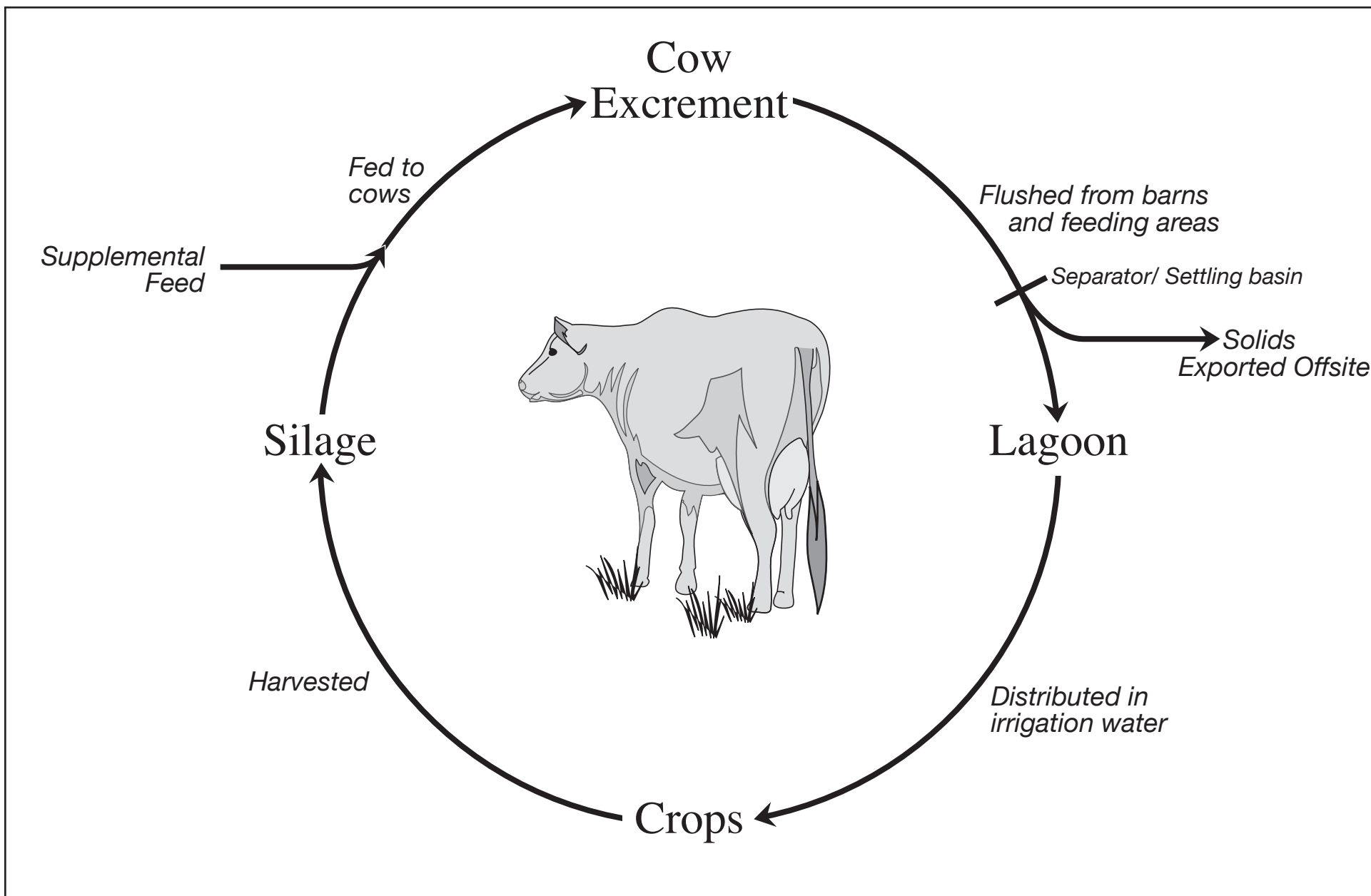
¹ The dairy facility has a limited land base. The proposed increase in herd would result in an associated increase in manure and greater increase in exports. With the amount of irrigated land in the area, there is a high demand for dairy manure as an economical fertilizer source for other growers, and the increased manure to be exported would easily be sold to third-party fertilizer companies.



SOURCE: Planning Partners, 2021

Hillcrest Dairy Expansion Project CUP20-013

Figure 3-8
Freestall Dairy Barn - Schematic Cross-Section



3.5.1 CIRCULATION AND PARKING

The project site would continue to be served by heavy trucks (milk tankers, commodity deliveries), and other vehicles. Daily trips by all classes of vehicle are estimated to increase from approximately 105.1 to 109.7 average daily trips, with an increase of 4.6 heavy truck trips per day (see Table 3-4). The majority of trips would consist of auto and light truck trips. Primary access to the dairy facility would continue to be Highway 140 to the south to North Hayden Road east of the project site. There is parking provided on site that can accommodate approximately 50 vehicles.

Table 3-4 Hillcrest Dairy Expansion Project Trip Generation and Assignment

Trip Type/Purpose	Daily Trip Generation Factor	Type of Vehicle	Daily Trips		Local Route of Trip
			Existing	With Project	
Residential Dwellings (on site)	2/residence *See Note 1	Auto/Light Truck	4	4	N. Hayden Road
Employees (dwelling off-site)	2/employee *See Note 2	Auto/Light Truck	78	78	N. Hayden Road
Milk Tanker	*See Note 3	Heavy Truck	6	8	N. Hayden Road
Commodities transport from offsite	*See Note 4	Heavy Truck	6	8	N. Hayden Road
Solid and liquid manure transport to off-site fields	*See Note 5	Heavy Truck	1.6	2.2	N. Hayden Road
Silage transport	*See Note 6	Heavy Truck	6.4	6.4	N. Hayden Road
Rendering Service	*See Note 7	Medium Truck	1.0	1.0	N. Hayden Road
Veterinarian	*See Note 8	Light Truck	0.1	0.1	N. Hayden Road
Purveyor sales	2/facility office	Auto/Light Truck	2	2	N. Hayden Road
Total Auto/Light Truck Trips			84.1	84.1	
Total Medium Truck Trips			1.0	1.0	
Total Heavy Truck Trips			20.0	24.6	
Total Trips			105.1	109.7	

Notes: Light Truck = up to 14,000 pounds (ex: Ford F-150); Medium Truck = 14,000 – 26,000 pounds (ex: Ford F-650);

Heavy Truck = 26,000 – over 33,000 pounds (ex: Tractor-trailer)

Trip Generation table based on Planning Partners assumptions and information obtained from project applicant.

1. There are 2 residences located at the dairy facility. For a dairy farm operation, a trip generation factor of 2 trips per day was used for both on-site residences and off-site employees.
2. There are currently 50 off-site employees, and there could be as many as 40 on site at any one time. Since there is one employee residences on site, it is assumed there are 39 off-site employees driving to work per day. The number of employees would not change with the proposed expansion.
3. One milk tanker truck visits the site 5-6 times daily. With the proposed expansion, the tanker truck will visit seven to eight times daily.
4. There are 5-6 commodity truck trips from offsite per day, and there would be seven to eight with the proposed expansion.
5. Commercial manure hauling vehicles are on-site for approximately 3-4 weeks annually to remove solid manure. Currently, there are approximately 600 diesel truck trips per year to export dry manure to off-site fields. Under proposed operations, there would be approximately 800 diesel truck trips per year to export dry manure to off-site fields.
6. Commercial silage trucks are on-site for approximately 4 weeks annually during harvest to haul feed crops. Currently, there are approximately 2,333 truck trips per year to haul feed crops, and under proposed operations, there would remain at approximately 2,333 truck trips per year.
7. A tallow truck (i.e., dead animal removal service) visits the site daily, and would remain at one trip per day with the proposed expansion.
8. A veterinary truck visits the site once every week.

Source: Planning Partners 2021. Project Applicant April 2021.

3.6 PROJECT CONSTRUCTION AND PHASING

The proposed dairy expansion would be constructed in two phases within two (2) years of the approval of the CUP. There would be minimal earth work anticipated with construction, since the project site has been previously graded and sloped when the original dairy was constructed.

3.6.1 DAIRY PERMITTING HISTORY

The dairy facility was originally constructed in 2002 under Merced County Administrative Permit (AA) 166. The AA 166 permit allowed for 2,050 milking cows plus support stock, to total 3,885 animal units². Conditional Use Permit No. CUP10-005 was issued in 2012 in order to bring the existing dairy facility in compliance with Merced County permit requirements in 2012 with 4,750 mature cows and 8,050 total animals. There is a Williamson Act Contract on file for the dairy site.

The Central Valley Regional Water Quality Control Board (CVRWQCB) regulates the existing dairy under the Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies (Order R5-2013-0122). As established by the Report of Waste Discharge (ROWD) submitted to the CVRWQCB as required in October 2005, the State-permitted herd size for the dairy is 4,750 milk and dry cows combined³, with regulatory review required for expansions of greater than 15 percent above this value (5,463 milk and dry cows combined).

The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates the existing dairy primarily through its Authority to Construct / Permit to Operate process. The Permit to Operate (PTO) on file for the existing dairy facility (expiration date December 31, 2023) issued by the SJVAPCD allows 4,000 milk cows (not to exceed a combined total of 4,750 mature cows) and 3,300 support stock.

3.7 ESTABLISHING THE PROPER “BASELINE” FOR THE PROPOSED DAIRY EXPANSION

To determine whether an impact is significant, a “baseline” set of environmental conditions is required against which agencies can assess the significance of project impacts. As established by CEQA Guidelines Section 15125(a), the existing environmental setting, usually established at the time a Notice of Preparation is issued, should normally constitute the baseline. In this case, “the impacts of a proposed project are ordinarily to be compared to the actual environmental conditions existing at the time of CEQA analysis, rather than to allowable conditions defined by a plan or regulatory framework” (*Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 158 Cal.App.4th 1336). Essentially, prior operating permits or permit levels do not in themselves establish a baseline for CEQA review of a new project. As set forth in *Communities for a Better Environment v. South Coast Air Quality Management District*, a long line of California Court of Appeals decisions has upheld this line of reasoning. These decisions have included cases where a plan or project allowed for greater development or more intense activity than had so far actually occurred, as well as cases where actual development or activity had, by the time CEQA analysis was begun, already exceeded that allowed under the existing regulations.

² An animal unit is a standardized measure of agricultural animals. A 1,000-pound beef cow is the standard measure of an animal unit.

The purpose of defining the environmental setting is to give decision-makers and the public an accurate picture of the project's likely impacts, both near-term and long-term. In some cases, “[e]nvironmental conditions may vary from year to year and ... it is necessary to consider conditions over a range of time periods” (quoting *Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 125). Lead agencies should choose the baseline that most meaningfully informs decision-makers and the public of the project's possible impacts.

In the case of the Hillcrest Dairy Expansion project, existing permits from Merced County, the SJVAPCD, and the CVRWQCB allow for the same cow numbers at the existing dairy, including a maximum of 4,750 mature cows. In accordance with CEQA, the baseline herd to be used in this environmental analysis is the herd count at the time that the NOP is circulated; in this case, the existing herd is the same as the currently permitted herd, with 4,750 mature cows and 8,050 total animals. Therefore, this herd size and dairy configuration accurately depicts the environmental baseline with which to identify the changes in the physical environment caused by the proposed project (including construction of the proposed facilities and expansion of the herd to a total of 5,750 mature cows and 9,750 total animals) pursuant to Section 15064(d) of the State CEQA Guidelines.

3.8 REQUIRED APPROVALS, OTHER PROCESSES, AND CONSULTATIONS

To allow for the expansion of the dairy, the applicant has submitted an application for issuance of a new Conditional Use Permit (CUP20-013) from the County. It is this action that is the subject of this EIR. The CVRWQCB and the SJVAPCD both regulate the existing dairy. As responsible agencies, they will be required to use the County's Environmental Impact Report in their consideration of the proposed dairy expansion. Following Merced County approval of the Environmental Impact Report and Conditional Use Permit and prior to construction of the proposed dairy expansion, the SJVAPCD and CVRWQCB will need to approve and issue the Authority to Construct / Permit to Operate permit and the Individual Waste Discharge Requirements for the project.

A listing and brief description of the regulatory permits and approvals required to implement the proposed project is provided below. This environmental document is intended to address the environmental impacts associated with all of the following decision actions and approvals.

MERCED COUNTY AND OTHER LOCAL AND REGIONAL AGENCIES

Merced County

The County has the following permitting authority related to the proposed Hillcrest Dairy Expansion project:

- Preparation and approval of an Environmental Impact Report - Merced County will act as the lead agency as defined by CEQA, and will have authority to determine if the Environmental Impact Report is adequate under CEQA.

- Approval of the Conditional Use Permit - Merced County will consider the proposed dairy project as a “Conditional Use Permit.” Conditional Use Permits are discretionary permits for uses of land that require special review to ensure that they are compatible with the neighborhood and surrounding land uses. They are considered more likely to affect surrounding land uses than uses permitted by right in a zoning district or those uses permitted under Administrative Permits.
- Building Permit - Merced County will require a building permit for the proposed dairy expansion project, specifically for any new structures exceeding 120 square feet.
- Hazardous Material Business Plan (HMBP) - The on-site storage of any hazardous material over threshold quantities (55 gallons; 200 cu. ft.; or 500 pounds) would require a HMBP to be filed with the Merced County Division of Environmental Health (DEH). Any quantity of hazardous waste generated on site also requires that a HMBP be filed. A revision to the Hazardous Material Business Plan for the proposed dairy expansion has been submitted to the Merced County Department of Environmental Health.

San Joaquin Valley Air Pollution Control District

- Authority to Construct / Permit to Operate – The owner or operator of any facility or activity (including agricultural activities) that emits criteria air pollutants or their precursors above certain thresholds must first obtain an Authority to Construct / Permit to Operate (ATC/PTO) from the SJVAPCD. This essentially is one permit that is issued in two steps. An ATC application would be required by the project applicant to modify the PTO from the SJVAPCD for the proposed dairy expansion. The applicant first obtains an ATC with specific conditions for implementation during construction; then an inspection is completed and, if all the conditions of the ATC are met during construction, the applicant is issued a PTO, and all conditions of the PTO must be met during operations. Beyond the ATC and PTO, preparation of an air quality impact assessment would be required, in addition to compliance with other SJVAPCD regulations. According to the project applicant, the SJVAPCD permit applications were submitted to the District on July 31, 2020.
- Conservation Management Practices Plan – The owner or operator of any agricultural facility of 100 acres or more, or an animal confinement facility in excess of 500 mature cows (for a dairy operation), must have submitted a CMP plan to the SJVAPCD prior to June 30, 2004 for existing uses, and prior to operation for proposed uses. The project applicant may be required to submit a modification request to their existing CMP Plan based on their proposed dairy expansion. A CMP plan requires that farm operators implement dust reduction practices for each of the following categories: harvest; unpaved roads; unpaved equipment/vehicle yards; and, other. One CMP Plan must be submitted for each crop currently grown or that will be grown within the two-year time frame of each Plan.

STATE OF CALIFORNIA

State agencies have the following permitting authority related to the proposed Hillcrest Dairy Expansion project:

State Water Resources Control Board

- General Construction Activity – The State Water Resources Control Board (SWRCB) has adopted a General Construction Activity Storm Water Permit for storm water discharges associated with any construction activity, including clearing, grading, excavation, reconstruction, and dredge and fill activities, that results in the disturbance of at least one acre of total land area.
- Public Water System – Based on the number of people on the site, the applicant must obtain a permit to operate a public water system. The facility shall then maintain compliance with that permit as long as 25 or more persons work at the facility on 60 or more days of the year. The permit requires demonstration that sufficient water is available from the water system's sources and distribution storage facilities to provide adequate water service. The need for a Public Water System Permit has been identified by Merced County DEH, and will be included as a condition of approval. If the State does not require a public water system permit, the presence of five or more service connections on the water system requires the facility to obtain a state small water system permit from Merced County.

Regional Water Quality Control Board - Central Valley Region

- Waste Discharge Requirements – The owner or operator of any facility or activity that discharges, or proposes to discharge, waste that may affect groundwater quality or from which waste may be discharged in a diffused manner (e.g., erosion from soil disturbance) must first obtain a WDR permit from the CVRWQCB. The CVRWQCB regulates discharges from dairies and other confined animal facilities according to the anti-degradation requirements of the Porter-Cologne Water Quality Control Act and the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. The project applicant has submitted a Report of Waste Discharge for the proposed dairy expansion. The CVRWQCB will be issuing Individual WDRs for the Hillcrest Dairy Expansion. Coverage under the General Order requires approval and implementation of a Nutrient Management Plan for the application of wastewater and/or dry manure to land application areas, and a Waste Management Plan to ensure proper compliance with the General Order. The proponents of the dairy plan to comply with the evolving CVRWQCB Salt Control Program as well.

FEDERAL GOVERNMENT

It is anticipated that no permitting from federal agencies would be required.

4 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

4.1 SCOPE OF THE EIR

On September 24, 2021 the Notice of Preparation (NOP) for this Environmental Impact Report (EIR) was filed with the Office of Planning and Research (OPR). The NOP and Initial Study were circulated to the public, local and state agencies, and other interested parties to solicit comments on the proposed project. (See Appendix A, *Notice of Preparation and Initial Study*, and Appendix B, *Comments on the Notice of Preparation*.) The following issues to be evaluated in the environmental document were identified in the NOP or raised in public and agency comments on the NOP:

- Air Quality and Odors
- Biological Resources
- Cultural Resources and Tribal Cultural Resources
- Greenhouse Gas Emissions and Energy Efficiency
- Nuisance Conditions from Insects
- Hydrology and Water Quality
- Land Use Compatibility

The *2030 Merced County General Plan* (2030 General Plan) EIR comprehensively evaluated the potential environmental effects of implementing the 2030 General Plan, and from the approval of new or modified land uses. As set forth in Section 1.5 of this document, the environmental analysis for this EIR is tiered from the EIR for the 2030 General Plan. Therefore, this environmental evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the EIR for the 2030 General Plan and adoption of the General Plan. This environmental analysis also applies mitigation measures previously adopted in the in the EIR for the *Merced County Animal Confinement Ordinance Revision (ACO)*, as applicable.

4.2 PRESENTATION OF THE IMPACT ANALYSIS IN THE EIR

The environmental analysis section of this EIR (Chapters 5 through 11) is organized and carried out in accordance with the California Environmental Quality Act (CEQA) Environmental Checklist Appendix G of the CEQA Guidelines, December 30, 2009, as updated; each section presents the setting, an assessment of the potential direct environmental impacts, and mitigation measures for each environmental issue area identified above and in Chapter 2, *Executive Summary*. Cumulative impacts are evaluated in Chapter 12, *Required CEQA Analyses*. For each resource category, the following conditions are discussed:

- **Environmental Setting.** This section provides a general overview of the environmental resource and the conditions on and adjacent to the project site. The setting is presented from site-specific, local, and regional perspectives, as appropriate for each environmental topic.
- **Regulatory Framework.** This section presents applicable laws, ordinances, regulations, and guidance for the resource, including the Merced County ACO. Where compliance with a cited regulation reduces or avoids a potential environmental effect, the relevant portions of the regulation are set forth.

- **Environmental Effects.** This section provides significance criteria with which to judge whether an environmental impact is significant, or less than significant. Significance criteria are established both by the State CEQA Guidelines and by the significance thresholds of federal, state, and local agencies. For evaluated impact categories, environmental topics evaluated in the EIR that were found to be less than significant in the Initial Study are summarized in this section. Potential environmental impacts associated with the proposed project are evaluated, the impacts' level of significance prior to mitigation is identified, and feasible mitigation measures for reducing the associated impacts are set forth. The level of significance after mitigation is then assessed.

4.3 PRESENTATION OF MITIGATION IN THE EIR

Mitigation measures identified in this report are characterized in one of two categories: (1) those necessary to reduce the identified impact below a level of significance; and, (2) those recommended to reduce the magnitude of a significant impact, but not below a level of significance. Where implementation of more than one mitigation measure is needed to reduce an impact below a level of significance, this fact is noted.

Mitigation measures in this EIR are formulated to be consistent with the strategy as set forth in State CEQA Guidelines Section 15370 as follows:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

4.4 DEVELOPMENT STANDARDS

Merced County development standards for private development projects have evolved over time to incorporate many construction requirements to lessen or eliminate environmental harm.

County procedures to minimize negative environmental effects and disruptions include analysis of existing features, responsible agency and public input to the design process, engineering and design standards, and construction controls. The activities to be implemented by the County during the project review, design, and construction phases, which serve to mitigate typical environmental impacts, are described in greater detail below. These measures are hereby incorporated into the project description.

These requirements are set forth in Performance Standards of the County Zoning Code (Merced County Code Chapter 18.40). The requirements of this Chapter are set forth below, and hereby incorporated by reference as though fully set forth herein. Copies of this document may be reviewed at Merced County, Community and Economic Development Department, 2222 M Street, Merced, California 95340.

4.4.1 STANDARD CONDITIONS FOR PRIVATE PROJECTS

Merced County has drafted standard conditions of approval for private development projects that are submitted to the County for review and approval. These standard conditions have been adopted by the Merced County Planning Commission (Resolution 20-001), are administered by the Community and Economic Development Department, and reflect the regulatory requirements of that Department, as well as the needs of the County Fire Department, Division of Environmental Health, and the Public Works Department. These standard conditions include:

Compliance with Permit Conditions: All development on the project property shall be constructed and thereafter maintained and operated in accordance with the conditions of the permit.

Regulation in General: The applicant shall comply with all applicable regulations administered by the County. These regulations shall include, but not be limited to, standards administered by the County Fire, Health, Public Works, and Merced County Community and Economic Development Departments.

Disturbances: No use shall be permitted which creates dust, dirt, mud, fumes, odors, vibrations, heat, glare, or electrical disturbances beyond the boundaries of the site.

Lighting: All exterior lighting shall be designed and maintained in a manner so that glare and reflections are contained within the boundaries of the subject parcel. Exterior lighting shall be hooded and directed downward and away from adjoining properties and public rights-of-way. Field performance monitoring shall be conducted by the Merced County Community and Economic Development Department.

Cultural Resources: The applicant shall inform in writing all contractors and subcontractors for the project of the potential discovery of significant archaeological and historical resources below the ground surface in the project area. If any cultural resources are found or disturbed during project activities, all work must be halted within the area, and the Merced County Community and Economic Development Department and a qualified archaeologist must be contacted to evaluate the find.

Erosion Control: If the construction site has been disturbed (cleared, graded or excavated) and is to remain inactive for a period of three or more months, it shall be seeded with an annual grass and watered until growth is evident. If after disturbance, the site is inactive for three or more months during the dry period (June-October), as an alternative to seeding, a soil-binding dust palliative, such as Hemicellulose extract (wood molasses) solution, may be applied.

If seeded, grass shall be mowed (not disced under) to a maximum height of four inches for fire control. Grasses do not need to be maintained in a green/growing condition. Mowing should occur before the grass dries out to avoid fires that may result from blades striking rocks.

Field performance monitoring shall be conducted on a random basis by the Merced County Community and Economic Development Department.

Dust Control: During clearing, grading, earth-moving and other site preparation activities, and all construction, exposed earth surfaces shall be watered whenever needed, in order to prevent dust

from leaving the project site on that phase of the project presently under development. Mud and dirt carried from the development onto adjacent roadways shall be cleaned up daily. Litter and debris shall be cleaned up daily to prevent it from leaving the project site and littering adjacent properties. Field performance monitoring shall be conducted on a random basis by the Merced County Community and Economic Development Department.

Storm Water Runoff: All storm water runoff from the site shall be disposed of subject to approval of the County Department of Public Works in one of the following ways: a) Uniform on-site percolation over widespread area; b) Use of on-site detention or retention basin; or 3) Off-site drainage to community drainage system.

Mosquito Abatement District Requirements: Compliance with all District requirements is required.

4.4.2 PROJECT-SPECIFIC CONDITIONS OF APPROVAL

As discussed in the Initial Study / Notice of Preparation (see Appendix A), the project site is in an area with rural levels/standards of fire protection. In response to this common condition in agricultural areas of the county, the Merced County Fire Department generally imposes requirements for on-site water storage for fire protection. The project shall comply with all applicable regulations administered by the County Fire Department, Environmental Health Division, Community and Economic Development, and Public Works Departments, including, but not limited to:

1. Fuel Storage
Provide Information on on-site fuel storage, amounts, types of fuel and oil, storage container sizes, dispensing equipment, and Spill Prevention Control and Countermeasure (SPCC) Plan documents.
2. On-Site Water:
Describe on-site water storage containment, amounts of water, are fire department connections in place, access to flush tank or other onsite water.
Merced County Fire Code Section 507.1 Required water supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings, or portions of buildings are hereafter constructed or moved into or within the jurisdiction.
3. Fire Department Access:
All driveways accessing the parcel shall be surfaced with an approved all weather driving surfacing material. Shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities.
(California Fire Code (CFC) Sec. 503) Fire apparatus access roads shall have an unobstructed width of not less than 20 feet except for approved security gates in accordance with Section 503.6 and an unobstructed vertical clearance of not less than 13 feet 6 inches. **(CFC 503.2.1)**

5 AIR QUALITY AND ODORS

This chapter provides an evaluation of the generation and influence of air pollutant emissions and odors generated by the proposed Hillcrest Dairy Expansion project. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), the construction and operation of the Hillcrest Dairy Expansion could result in the generation of air pollutants and nuisance odors.

The technical analysis of air quality and odors prepared for this EIR has been conducted to comply with the requirements of the San Joaquin Valley Air Pollution Control District (SJVAPCD), the Merced County 2030 General Plan, and the Animal Confinement Ordinance (ACO). Merced County adopted mitigation measures and study protocols in its certification of the 2030 Merced County General Plan EIR and the EIR for Revisions to the ACO, and in its approval of the ACO. The following evaluation implements, and is consistent with, these mitigation measures and study protocols.

INTRODUCTION

Air Quality

Air quality influences public health and welfare, the economy, and quality of life. Air pollutants have the potential to adversely impact public health, the production and quality of agricultural crops, visibility, native vegetation, and buildings and structures.

Criteria pollutants are those that are regulated by either the state or federal Clean Air Acts. Non-criteria pollutants are not regulated by these Acts, but are a concern as precursors to criteria pollutants and/or for their potential for harm or nuisance.

The criteria pollutants of most interest in the San Joaquin Valley associated with dairy sources are ozone and particulates (dust). Ozone is not emitted directly into the environment; rather, it is generated from complex chemical reactions in the presence of sunlight between reactive organic gases (ROG) (or non-methane hydrocarbons), and oxides of nitrogen (NO_x). Ozone is a powerful respiratory irritant. Particulate matter is classified as respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}). Exposure to elevated levels of particulate matter causes irritation of the eyes and respiratory system, and exposure is implicated in increased levels of disease and death.

Important non-criteria pollutants include air toxics. Air toxics are generated from industrial processes (e.g., gas stations, dry cleaners, or car repairs), mobile sources using diesel engines, and agricultural sources such as dairies.

Odors associated with dairy and other animal confinement operations are primarily generated from manure and silage. Odor from these operations is the composite of as many as 170 or more specific gases, including ammonia, hydrogen sulfide, amines, organic acids, and heterocyclic nitrogen-bearing compounds. The odor characteristics that contribute to nuisance conditions include the intensity, concentration or strength of the odor, the odor frequency, the duration that the odor remains detectable, and the perceived offensiveness and character or quality of the odor.

5.1 REGULATORY FRAMEWORK

5.1.1 FEDERAL REGULATORY FRAMEWORK

AIR QUALITY

The United States Environmental Protection Agency (EPA) is responsible for enforcing the many federal environmental and hazardous waste laws, including the federal Clean Air Act (CAA). California is within the jurisdiction of EPA Region IX, with offices in San Francisco. The CAA, established in 1963, was substantially modified in 1970 and again amended in 1990 to authorize the establishment of national health-based air quality standards, set deadlines for their attainment, and establish actions required of areas in the nation that exceeded these standards. Under the CAA, state and local agencies in areas that exceed the National Ambient Air Quality Standards (NAAQS) are required to develop state implementation plans (SIP) to show how they will achieve the NAAQS for ozone and particulate matter by specified dates (42 USC 7409, 7411). The EPA's responsibility to control air pollution in individual states is primarily to review submittals of SIPs that are prepared by each state.

The EPA requires that farms operating diesel-powered engines for farming operations submit an application for permit under Title V of the CAA if emissions from the engines exceed half of the major source threshold. Title V permits are operating permits issued by state or local permitting authorities to mostly large sources and some smaller sources of air pollution. Other agricultural operations, including animal confinement facilities over a certain size, are also required to apply for a Title V permit. Issuance of the Title V permit in California is delegated to local air districts in California; in this case, the SJVAPCD.

ODOR CONTROL

No federal laws exist for odor emissions; regulation is achieved through County ordinances, and enforced based upon complaints.

5.1.2 STATE OF CALIFORNIA REGULATORY FRAMEWORK

AIR QUALITY

In California, the California Air Resources Board (ARB) is responsible for preparing and enforcing the federally-required SIP in an effort to achieve and maintain NAAQS and California Ambient Air Quality Standards (CAAQS), which were developed as part of the California Clean Air Act (CCAA) adopted in 1988. CAAQS for criteria pollutants equal or surpass NAAQS, and include other pollutants for which there are no NAAQS. In addition, the ARB is responsible for assigning air basin attainment and nonattainment designations in California. Air basins are designated as being in attainment if the levels of a criteria air pollutant meet the NAAQS or CAAQS for the pollutant, and are designated as being in nonattainment if the level of a criteria air pollutant is higher than the corresponding NAAQS or CAAQS.

The ARB is the oversight agency responsible for regulating statewide air quality, but implementation and administration of NAAQS and CAAQS is delegated to several regional Air Pollution Control Districts (APCD) and Air Quality Management Districts (AQMD). These districts have been created for specific air basins, and have principal responsibility for:

- Developing plans to meet CAAQS and NAAQS;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain CAAQS and NAAQS;
- Implementing permit programs established for construction, modification, and operational air pollution sources;
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and,
- Developing employer-based trip reduction programs.

To regulate air pollutant emissions within California, the state has been divided into 15 Air Basins based upon similar meteorological and geographic conditions, and consideration for political boundary lines whenever practicable. Merced County is located in the San Joaquin Valley Air Basin (SJVAB), which is the second largest air basin in California. This Air Basin also includes San Joaquin County, Stanislaus County, Madera County, Fresno County, Kings County, Tulare County, and a portion of Kern County (see Figure 5-1).

Any stationary source equipment used in agricultural operations in the growing of crops or the raising of animals that may cause emissions of air contaminants is required by state law to obtain a permit from the local Air Pollution Control District.

ODOR CONTROL

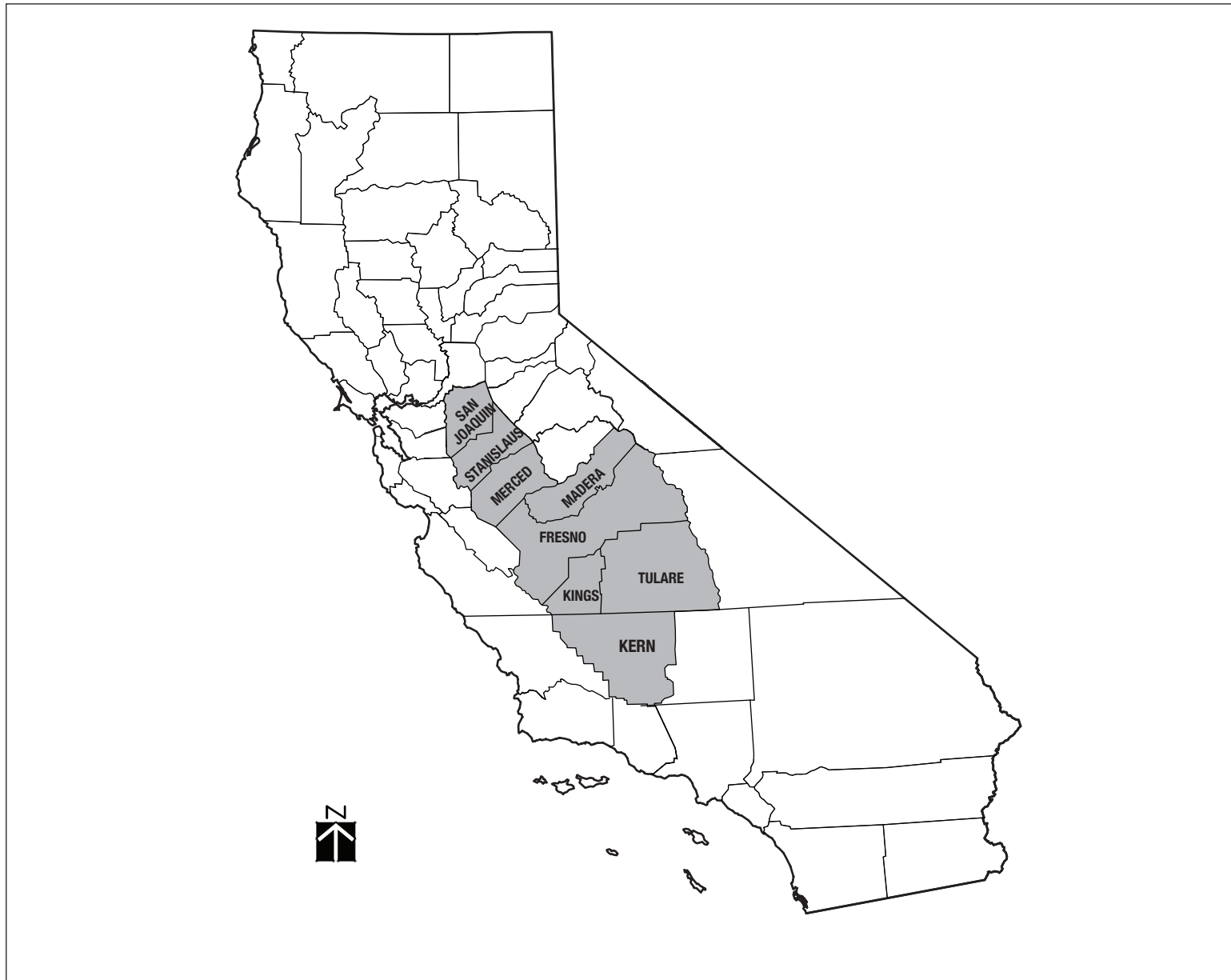
No state laws exist for odor emissions; regulation is achieved through County ordinances, and enforced based upon complaints.

5.1.3 SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

The SJVAPCD is the lead air quality regulatory agency for the San Joaquin Valley Air Basin. The SJVAPCD has jurisdiction over all point and area sources of air emissions except for mobile sources (such as motor vehicles), consumer products, and pesticides. The SJVAPCD and ARB have joint responsibility for attaining and maintaining the NAAQS and CAAQS in the Air Basin.

The SJVAPCD is required to prepare ozone and PM_{2.5} attainment demonstration plans to identify the regulatory framework necessary to bring the San Joaquin Valley into compliance with the ozone and PM_{2.5} NAAQS. These attainment plans are described below.

The SJVAPCD is a CEQA Responsible Agency for the proposed Hillcrest Dairy Expansion project via the SJVAPCD Permits Required Rule (Rule 2010) and New Source Review Rule (Rule 2201) (State CEQA Guidelines Section 15381).



SOURCE: San Joaquin Valley Air Pollution Control District 2012; Planning Partners 2022

Hillcrest Dairy Expansion Project CUP20-013

Figure 5-1
San Joaquin Valley Air Basin

OZONE ATTAINMENT DEMONSTRATION PLAN (OZONE PLAN)

The SJVAB is designated as an extreme ozone nonattainment area for the EPA's 2008 8-hour ozone standard of 75 parts per billion (ppb). The SJVAPCD 2016 Ozone Plan addresses the EPA's 2008 8-hour ozone standard and identifies strategies to reduce NO_x emissions by over 60 percent between 2012 and 2031. The plan demonstrates attainment by no later than December 31, 2031.

The EPA set the newest NAAQS for 8-hour ozone at 70 ppb effective December 28, 2015. EPA has designated the San Joaquin Valley as Extreme Nonattainment for this standard, with an attainment deadline of 2037. The District adopted the 2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard on June 18, 2020. The preparation of the *2020 RACT Demonstration* included a comprehensive evaluation of all NO_x and VOC District rules to ensure that each rule meets or exceeds RACT. The *2020 RACT Demonstration* fulfills CAA requirements and demonstrates that all federal RACT requirements continue to be satisfied in the Valley. A New Ozone Attainment Plan is now under development and will be completed by August 2022 (SJVAPCD 2021).

The control measures included in the attainment plan apply to currently regulated sources under SJVAPCD jurisdiction, but the cooperation of other federal, state, and local agencies is required to achieve attainment with federal ozone standards. The EPA and ARB are responsible for emission controls of aircraft, farming equipment, pesticides, consumer products, and motor vehicles that significantly contribute to the ozone pollution in the Air Basin.

Although EPA revoked its 1979 1-hour ozone standard in June 2005, many planning requirements remain in place, and the SJVAB must still attain this standard. The SJVAPCD 2013 Plan for the Revoked 1-Hour Ozone Standard (2013 Ozone Plan) includes modeling confirming that the SJVAB attained EPA's 1-hour standard by 2017 (SJVAPCD 2021). Thus, the SJVAB now meets the 1-hour ozone standard based on air monitoring data. On June 30, 2016, EPA took final action determining that the San Joaquin Valley had attained the 1-hour ozone national ambient air quality standard.

PM₁₀ PLAN

Based on a decline in PM₁₀ emissions, the San Joaquin Valley became the first air basin classified as "serious nonattainment" to be reclassified by EPA as in "attainment" of the PM₁₀ standards. The SJVAPCD adopted the 2007 PM₁₀ Maintenance Plan to assure the San Joaquin Valley's continued attainment of EPA's PM₁₀ standard.

PM_{2.5} PLAN

The San Joaquin Valley is classified as "serious" nonattainment for federal PM_{2.5} (fine particulate matter) standards. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards on November 15, 2018. This plan addresses the EPA federal 1997 annual PM_{2.5} standard of 15 micrograms per cubic meter (µg/m³) and 24-hour PM_{2.5} standard of 65 µg/m³; the 2006 24-hour PM_{2.5} standard of 35 µg/m³; and the 2012 annual PM_{2.5} standard of 12 µg/m³. This Plan includes aggressive incentive-based control measures that achieve the massive emissions reductions needed to bring the Valley into attainment and will require significant funding estimated at \$5 billion.

SJVAPCD RULES AND REGULATIONS APPLICABLE TO DAIRIES

Rule 2010 Permits Required. SJVAPCD Rule 2010 applies to agricultural uses, including dairies, and states that “any person who plans to or does operate, construct, alter, or replace any source of emission of air contaminants” must obtain the approval of the Air Pollution Control Officer and receive an Authority to Construct (ATC) and a Permit to Operate (PTO). The SJVAPCD requires an ATC/PTO for new animal confinement facilities with emissions in excess of five tons¹ per year² of volatile organic compounds (VOC), which are often referred to as reactive organic gases³, or for expanding facilities with an existing ATC/PTO. An ATC must be obtained before building or installing a new emissions unit or modifying an existing emissions unit that requires a permit. A PTO is issued after all construction is completed and the emission unit is ready for operation.

Dairy operations with non-fugitive emissions that exceed 10 tons/year for VOC and NO_x by either exceeding milk cow equivalents or from multiple agricultural engine emissions are required to obtain a federal Title V permit in compliance with the CAA. The SJVAPCD manages the Title V permit process, and issues both the District and Title V permit as a single permit. Emission estimates that contribute toward determining if a facility is subject to Title V permitting would include non-fugitive emissions from animal feeding operations, stationary internal combustion engines, and any other stationary equipment that may emit air contaminants. The process for obtaining a Title V permit involves additional steps beyond obtaining an ATC/PTO.

The ATC/PTO permit process is separate from the Conservation Management Practice (CMP) plans (see Rule 4550 below). However, if a facility submits their PTO application and CMP plan at the same time, the SJVAPCD will process the two permits concurrently. If a source requires both a CMP and PTO, the SJVAPCD will not charge any CMP fees for that facility (Rule 3190, Section 4.0).

Regulation VIII Fugitive PM₁₀ Prohibitions: Rules 8011-8081. Regulation VIII includes specific emission control strategies for fugitive dust from construction/demolition, bulk materials, carryout, open areas, paved and unpaved roads, equipment on unpaved roads, paved road dust, fugitive windblown dust, and farming operations. Regulation VIII Rules 8011-8081, including preparation of a dust control plan, apply to the Hillcrest Dairy Expansion project and are designed to reduce PM₁₀ emissions.

Rule 2201: New and Modified Source Review. New sources of air pollution, and modifications of existing sources, must comply with District Rule 2201, also known as New Source Review (NSR). The NSR rule provides the mechanism for the District to issue permits to new and expanding businesses without interfering with efforts to meet the state and federal health-based air quality standards. NSR contains several main requirements – Best Available Control Technology (BACT),

¹ A United States ton, or short ton, is equal to 2,000 pounds (907 kg), while a metric ton, or tonnes, is equal to 2,205 pounds (1,000 kg).

² District Rule 2020, Exemptions, Section 6.20.1, exempts Agricultural sources that, in aggregate, produce actual emissions less than one-half of the major source thresholds (10 tons/year for NO_x and VOC).

³ The EPA defines volatile organic compounds (VOC) as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. The California Air Resources Board uses the term reactive organic gases (ROG) in its emission inventory, which means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. However, not all identified VOCs are ROG, as some are non-reactive hydrocarbons that may not significantly contribute to ozone formation.

Best Available Retrofit Control Technology (BARCT), and offsets. However, agricultural sources are generally exempt from offsets, unless that agricultural source is also a major stationary source. If total operations of new dairies exceed five tons per year of emissions (i.e., VOCs and NO_x), NSR rules apply. This triggers BACT and BARCT for the new “emissions sources,” applied through the ATC and PTO permits. If any existing source makes modifications to its operations, and those modifications generate two pounds or more per day of any criteria emissions, the NSR is also triggered.

Rule 3135: Dust Control Plan Fee. This rule requires the applicant to submit a fee in addition to a dust control plan (per Rules 8011-8081).

Rule 4002: (National Emission Standards for Hazardous Air Pollutants). In the event that any portion of an existing building will be renovated, partially demolished, or removed, the project will be subject to District Rule 4002. Prior to any demolition activity, an asbestos survey of existing structures on the project site may be required to identify the presence of any asbestos containing building material (ACBM). In accordance with CAL-OSHA requirements, a certified asbestos contractor must remove any identified ACBM having the potential for disturbance.

Rule 4102: Nuisance. This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to District enforcement action. Odors emanating from agricultural operations, however, are exempt.

Rule 4550: Conservation Management Practices. The purpose of this rule is to limit fugitive dust emissions from agricultural operations. The rule outlines requirements for owner/operators of agricultural operations to prepare CMP plans for all agricultural producers with 100 contiguous acres or more to reduce dust emissions in areas of crop production, animal feeding operations, and unpaved roads/equipment areas.

Rule 4570: Confined Animal Facilities. Rule 4570 requires that all owners/operators of any Confined Animal Facility (CAF) shall submit a permit application for each CAF – this applies to dairies with greater than or equal to 500 milk cows. The application shall include an emission mitigation plan that lists the VOC mitigation measures that the facility will use to comply with all applicable requirements of Rule 4570. All dairies that are currently subject to the rule must comply with Phase II mitigation measures. These mitigation measures include management practices that minimize the formations of VOCs or control VOCs by moving the VOC-forming material to a controlled situation. Examples of management practice type mitigation measures are feed manipulation, frequent scraping of animal housing, and covering of silage piles. Operators must choose a certain number of management practices from a limited menu of options for each operation (for a list of mitigation options, see Appendix D of this EIR).

Rule 4601: Architectural Coatings. This rule applies if there are any architectural coatings applied to structures. The purpose of this rule is to limit VOC emissions from architectural coatings. This rule specifies architectural coatings storage, cleanup, and labeling requirements.

Rule 4641: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.

Rule 4702: Internal Combustion Engines – If internal combustion engines or spark-ignited internal combustion engines (such as diesel generators) are used as part of the dairy operations, these rules limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), and VOC from internal combustion engines or spark-ignited internal combustion engines rated at 25 brake horsepower or greater.

SJVAPCD Policy for Risk Management Review: The purpose of a Risk Management Review (RMR) is to ensure on-going compliance with the Air Toxics “Hot Spots” information and Assessment Act of 1987 (AB 2588). SJVAPCD’s Technical Services unit performs the RMRs for dairies being permitted by the District for those activities covered under the permits. The health risk assessment addresses emissions from: ammonia; hydrogen sulfide; particulate matter and its toxics components (e.g., aluminum, lead, manganese, nickel, etc.); and xylenes, formaldehydes, carbon tetrachloride, and other components from VOCs.

ODOR CONTROL

The SJVAPCD 2015 *Guide for Assessing Air Quality Impacts* (GAMAQI) includes a screening tool for odor sources to qualitatively assess a project’s potential to adversely affect area receptors. According to the screening tool, if there are sensitive receptors (e.g., hospitals, schools, and residential areas) within one mile of a feed lot or dairy, then a more detailed investigation should be provided due to a greater possibility of nuisance⁴. Because of the subjective nature of odor impacts, the many variables that can influence odors, and the many types of odor sources, the SJVAPCD does not prescribe any quantitative methodologies to determine if potential odors would have a significant impact. Rather, lead agencies are encouraged to make a determination of significance based on a review of complaint records. The SJVAPCD defines a significant odor problem as more than one confirmed complaint per year or three unconfirmed complaints per year averaged over a three-year period.

5.1.4 MERCED COUNTY

Chapter 18.64.050, Sections U and HH⁵ of the Merced County Animal Confinement Ordinance (see Appendix C of this EIR) require compliance with requirements of the SJVAPCD and reduction of air emissions as set forth below.

18.64.050 General

- U. The animal confinement facility and access roads shall meet the requirements of the San Joaquin Valley Unified Air Pollution Control District.
- HH. New or expanding animal confinement facilities shall provide and maintain one or more of the following dust control measures on unpaved roads within the facility area:
 - 1. A uniform layer of washed gravel; or
 - 2. Chemical/organic dust suppressants; or
 - 3. Vegetative materials; or
 - 4. Paving; or
 - 5. Any other method that effectively limits visible dust emissions to 20 percent opacity.

⁴ Odors emanating from agricultural operations such as dairies are exempt from District Rule 4102 Nuisance.

⁵ As noted above, the SJVAPCD has adopted Rules 4550 and 4570 for the control of PM₁₀ and ROG emissions from dairies, thereby voiding Section 18.64.050 OO of the Animal Confinement Ordinance that previously applied.

MERCED COUNTY GENERAL PLAN

The Air Quality Element of the Merced County General Plan contains goals and policies pertaining to the protection of air quality in Merced County. Those policies that are relevant to the proposed project are presented below:

Policy AQ-2.2: Development Review Process

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

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

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-2.5: Innovative Mitigation Measures

Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties.

Policy AQ-2.7: Air District Best Performance Standards

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-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-6.8: Voluntary Emissions Reduction Agreement

Require all project applicants, where project emissions have been evaluated to exceed SJVAPCD significance thresholds, to consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Support the SJVAPCD in its efforts to fund the Emission Reduction Incentive Program.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

ODOR CONTROL

Merced County uses a setback approach to odor nuisance control, requiring setbacks between animal confinement facilities and other uses of 0.5 mile for urban areas and sensitive uses, and 1,000 feet for isolated rural residences. The following provision of the ACO (see Appendix C) addresses nuisance effects from odors.

18.64.060 Comprehensive Nutrient Management Plan

- C. The CNMP shall contain the following components and other information as required by the Division of Environmental Health:
8. Operation and Maintenance of the Facility
 - a. Describe odor control measures.

The Merced County Code also includes a Right-to-Farm Ordinance (Chapter 17.08.080(H)) that seeks to reduce the opposition of residential neighbors to nuisances created by commercial farming, such as odors. Since 1986, Merced County's Right-to-Farm Ordinance has been administered by the Community and Economic Development Department (CEDD). The Ordinance is an educational and disclosure measure, not a regulatory requirement. It informs purchasers of property during the residential development process, when subdivisions or parcel splits are approved and building permits are issued, about the local importance of agriculture and the possible negative impacts of locating residences near common farm operations.

The 2030 Merced County General Plan contains policies that seek to reduce nuisance conditions consistent with the ACO measures and Right-to-Farm Ordinance cited above. Those policies that are relevant to the proposed project are presented below:

Policy AG-3.1: Right-to-Farm Ordinance

Continue to implement the Right-to-Farm Ordinance to define and limit instances where agricultural operations may be considered a nuisance to surrounding rural residential, residential or urban development.

Policy AG-3.9: New Confined Animal Facility Location Requirements

Require new or expanded confined animal facilities to be located, at a minimum:

- a) One-half mile from any Rural Center or Urban Community boundary; residentially-designated or zoned property; sensitive uses such as schools, hospitals, jails, Federal wildlife areas, State wildlife areas, and public parks; or concentrations of five or more off-site residences. This does not include areas for municipal uses such as wastewater treatment facilities, airports, or solid waste recycling or disposal facilities located outside urban areas; and
- b) One thousand feet from any off-site residence, unless there is written permission from the off-site property owner.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

5.1.5 AIR QUALITY STANDARDS

The EPA has set NAAQS for ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, respirable particulate matter (PM₁₀), and airborne lead. In addition to the NAAQS, the ARB has established CAAQS to protect public health and welfare. Standards have been set for ozone, sulfur dioxide, PM₁₀, sulfates, airborne lead, hydrogen sulfide, and vinyl chloride, at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases. An area where the standard for a pollutant is exceeded is considered a

nonattainment area, and is subject to planning and pollution control requirements that are more stringent than normal requirements. The ARB is responsible for assigning air basin attainment and nonattainment designations for federal and state criteria pollutants.

State and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies on the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (i.e., one hour), or to a relatively lower average concentration over a longer period (e.g., eight hours, 24 hours, or one month). For some pollutants, there is more than one air quality standard, reflecting both its short-term and long-term effects.

Table 5-1 presents the CAAQS and NAAQS for selected pollutants. Table 5-2 summarizes the attainment status of the Air Basin. Of the criteria pollutants, the Air Basin is in nonattainment for ozone, PM_{2.5}, and state PM₁₀. As discussed above, the SJVAPCD has enacted plans designed to bring the basin back to attainment status for ozone and PM_{2.5}.

Table 5-1 Federal and California Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California Standards Concentration	Federal Primary Standards Concentration
Ozone (O ₃)	8-hour	0.07 ppm (137 µg/m ³)	0.070 ppm (137 µg/m ³)
	1-hour	0.09 ppm (180 µg/m ³)	---
Respirable Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	---
Fine Particulate Matter (PM _{2.5})	24-hour	---	35 µg/m ³
	Annual Average	12 µg/m ³	12 µg/m ³
Carbon Monoxide	8-hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
Nitrogen Dioxide	Annual Average	0.03 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)
	1-hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)
Lead	30-day Average	1.5 µg/m ³	---
	Rolling 3-Month Average	---	0.15 µg/m ³
Sulfur Dioxide	24-hour	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas)
	3-hour	---	---
	1-hour	0.25 ppm (655 µg/m ³)	0.075 ppm (196 µg/m ³)
Sulfates	24-hour	25 µg/m ³	No Federal Standard
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	No Federal Standard
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m ³)	No Federal Standard

Notes: ppm = parts per million; mg/m³ = milligrams per cubic meter; µg/m³ = micrograms per cubic meter

Shaded areas indicate that Merced County is in non-attainment for that air pollutant standard.

Source: ARB 2020, ARB 2016, EPA 2021.

Table 5-2 San Joaquin Valley Air Basin Attainment Status

Pollutant	State of California Attainment Status	Federal Attainment Status
Ozone – 1-hour	Nonattainment/Severe	Attainment ^a
Ozone – 8-hour	Nonattainment	Nonattainment/ Extreme
Respirable Particulate Matter (PM ₁₀)	Nonattainment	Attainment
Fine Particulate Matter (PM _{2.5})	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment	Attainment/Unclassified
Lead	Attainment	No designation
Sulfur Dioxide	Attainment	Attainment/Unclassified
Sulfates	Attainment	No Federal Standard
Hydrogen Sulfide	Unclassified	No Federal Standard

Notes:

a On June 30, 2016, the EPA made a determination of attainment of the 1-hour ozone standard in the San Joaquin Valley.

Source: ARB 2020, EPA 2021a.

5.2 ENVIRONMENTAL SETTING

5.2.1 AIR QUALITY

CLIMATE AND METEOROLOGY

The San Joaquin Valley is bounded by the Sierra Nevada mountain range to the east, the coastal mountain ranges to the west, the Tehachapi mountains to the south, and San Joaquin County to the north. The Valley is approximately 250 miles long and averages approximately 35 miles in width.

From west to east, elevations in and adjacent to the San Joaquin Valley range from approximately 3,000 feet above mean sea level (MSL) along the crest of the coastal mountain ranges, to below sea level in areas of the Valley itself, and above 10,000 feet msl along the crest of the Sierra Nevada. The predominant wind direction in the Valley is from the northwest toward the southeast.

The climate in Merced County is semiarid, characterized by hot, dry summers and cold, moist winters. The warmest month is July with average temperatures in the 90°s Fahrenheit and midday temperatures ranging up to 100° to 110°. The coldest month is January with average low temperatures in the 30°s.

Annual precipitation, mostly rainfall, ranges from 8 to 13 inches in the San Joaquin Valley, 9 to 14 inches in the foothills of the Sierra Nevada, to 13 to 24 inches in the Sierra Nevada. The average length of the frost-free season in Merced County is approximately 250 days per year. Precipitation occurs mainly from November to April; January typically has the highest rainfall. Fog is prevalent in the valley from December to March.

The mountains surrounding the San Joaquin Valley Air Basin (Air Basin) restrict air movement through and out of the basin, and, as a result, impede the dispersion of pollutants from the basin. Inversion layers are formed in the Air Basin throughout the summer and winter. These layers occur

when cooler air near the ground surface is overlain by warmer air that prevents the vertical dispersion of pollutants. During the summer, the San Joaquin Valley experiences daytime temperature inversions at elevations from 2,000 to 2,500 feet above the valley floor, and during the winter, inversions occur at elevations from 500 to 1,000 feet above the valley floor.

CRITERIA AND NON-CRITERIA AIR POLLUTANTS

Criteria pollutants are those that are regulated by either the state or federal Clean Air Acts. Non-criteria pollutants are not regulated by these Acts, but are nonetheless of concern for animal confinement facilities because they may be precursors to criteria pollutants, or because of their potential for harm or nuisance. Table 5-3 provides a description of each of the criteria air pollutants and their known health effects.

Table 5-3 Air Pollutants and Associated Health Effects		
Pollutant	Major Source	Human Health Effects
Ozone (O ₃)	Formed from chemical reactions between reactive organic gases/volatile organic compounds (ROG or VOC), or non-methane hydrocarbons, and nitrogen oxides in the presence of sunlight. Major ROG and NO _x generators in the San Joaquin Valley include: motor vehicles and farming equipment such as tractors, feed trucks, and pumps; farming operations; and solvent evaporation.	Eye irritation and damage to lung tissue. Increased risk of premature mortality, pulmonary inflammation, the risk of asthma attacks, and the need for medical treatment and for hospitalization of persons with asthma. Ozone also harms vegetation, reduces crop yields, and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics.
Particulate Matter (PM ₁₀ and PM _{2.5})	The main sources of fugitive dusts are unpaved roads, construction, and paved roads. Additional sources of PM ₁₀ include fuel combustion, mobile sources, industrial processes, agriculture, fires, solvents, and miscellaneous sources. In animal confinement facility operations, particulates are primarily produced as a result of animal movement on dry manure, soil tillage, harvesting, and vehicle travel on unpaved roads. Secondary PM ₁₀ formation occurs as a result of the reaction of ammonia with nitrous oxides/sulfur oxides to form aerosols. Ammonia emissions from dairies are considered to be precursors to PM _{2.5} formation. Federal and state standards have not been developed for ammonia, but it is listed in AB 2588 as a substance for which emissions must be estimated for facilities that exceed certain thresholds. These thresholds include facilities that emit 10 or more tons of PM ₁₀ annually.	Irritation of the eyes and respiratory system. Longer-term exposure to particulate matter is associated with chronic respiratory inflammation, rhinitis, asthma, increased susceptibility to respiratory tract infections, and increased mortality. Also, irregular heartbeat and heart attacks may result.
Carbon monoxide (CO)	Carbon monoxide is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. Because rural areas of the San Joaquin Valley and Merced County are classified as attainment for CO, and animal confinement facilities and activities associated with them are very minor sources of CO, this pollutant will not be discussed further.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.

Table 5-3 Air Pollutants and Associated Health Effects

Pollutant	Major Source	Human Health Effects
Nitrogen Oxides	Nitrogen Oxides react photochemically with hydrocarbons in the presence of sunlight to form ozone. Nitrogen oxides are major contributors to smog formation and acid deposition. Sources include on-road motor vehicles; other mobile sources such as aircraft, trains, boats, and farm equipment; and stationary sources of fuel combustion such as oil and gas production and industrial facilities. In agriculture, nitrous oxides are released from the nitrification of ammonia in livestock waste, but more is released directly from soil.	NO ₂ is a deep lung irritant and may cause pulmonary edema when inhaled in sufficient quantities. Chronic exposures to NO ₂ may cause pulmonary damage, decreased pulmonary function, and increased susceptibility to respiratory infection. Other studies have shown that short-term or long-term exposures to NO ₂ can increase susceptibility to respiratory infection by bacterial pneumonia or influenza virus.
Lead	Sources of lead resulting in concentrations in the air include industrial sources and crustal weathering of soils followed by fugitive dust emissions. Because the San Joaquin Valley and Merced County are classified as attainment for lead, and animal confinement facilities and activities associated with them are very minor sources of lead, this pollutant will not be discussed further.	Health effects from exposure to lead include brain damage, kidney damage, and learning disabilities.
Sulfates	Sulfates are the product of further oxidation of sulfur dioxide, which is produced when any sulfur-containing fuel is burned, or by chemical plants that treat or refine sulfur or sulfur containing chemicals. Sulfates contribute to acid deposition problems, and form aerosols, which contribute to PM _{2.5} . Because the San Joaquin Valley and Merced County are classified as attainment for sulfates, and animal confinement facilities and activities associated with them are very minor sources of sulfates, this pollutant will not be discussed further.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.

Source: California Air Pollution Control Officers Association 2021.

As described above, the Air Basin is currently in nonattainment for several criteria pollutants. In general, increased emissions could be expected to increase existing levels of chronic lung disease and to increase morbidity⁶ and mortality. While the ARB is continually refining livestock emission estimates and incorporating this data into its regional air quality models for ozone and particulate matter, there is a lack of commonly accepted epidemiological models to forecast health impacts from dairies and other confined animal facilities (Mitloehner 2007). However, it has been well documented that there are adverse respiratory effects from exposure in agricultural occupations. Harmful air emissions from animal confinement facilities result from feed handling, animal movement, and manure storage and removal; these emissions tend to impact farm workers, who experience higher exposure, more than neighboring residents, who experience lower exposures (Mitloehner 2007).

⁶ Illness or disease.

AIR QUALITY MONITORING

The San Joaquin Valley Air Basin's air quality monitoring network provides information on ambient concentrations of air pollutants. The SJVAPCD operates several monitoring stations in the SJVAB, including two stations in Merced County, where the air quality data for ozone, PM_{2.5}, and PM₁₀ were obtained. Table 5-4 compares a five-year summary of the highest annual criteria air pollutant emissions collected at these monitoring stations with applicable CAAQS, which are more stringent than the corresponding NAAQS. Due to the regional nature of these pollutants, ozone, PM_{2.5}, and PM₁₀ are expected to be fairly representative of the project area.

As indicated in Table 5-4, the O₃, PM_{2.5} and PM₁₀ federal and state standards have been exceeded in Merced County over the past five years, with the exception of the federal PM₁₀ standard, which was not exceeded.

Table 5-4 Annual Air Quality Data for Merced County Air Quality Monitoring Stations					
Pollutant	2016	2017	2018	2019	2020**
Ozone (O₃) 1-hour: <i>Monitoring location: Merced County – S Coffee Avenue</i>					
Maximum Concentration (ppm)	<u>0.097</u>	0.093	<u>0.104</u>	0.087	<u>0.100</u>
Days Exceeding State Standard (1-hr avg. > 0.09 ppm)	2	0	4	0	2
Ozone (O₃) 8-hour: <i>Monitoring location: Merced County – S Coffee Avenue</i>					
Maximum Concentration (ppm)	<u>0.087</u>	<u>0.085</u>	<u>0.084</u>	<u>0.077</u>	<u>0.088</u>
Days Exceeding State Standard (8-hr avg. > 0.070 ppm)	29	17	23	6	21
Days Exceeding National Standard (8-hr avg. > 0.075 ppm)	13	8	7	1	5
PM₁₀: <i>Monitoring location: Merced County – 2334 M Street</i>					
Days Exceeding State Standard (Daily Standard 50 µg/m ³)	38.9	76.6	59.6	54.4	*
Maximum State 24-Hour Concentration (µg/m ³)	<u>64.5</u>	<u>144.0</u>	<u>142.7</u>	<u>92.1</u>	<u>209.9</u>
Days Exceeding Federal Standard (Daily Standard 150 µg/m ³)	0	0	0	0	5.8
Maximum Federal 24-Hour Concentration (µg/m ³)	64.3	146.6	137.0	96.1	<u>210.7</u>
PM_{2.5}: <i>Monitoring location: Merced County – 2334 M Street</i>					
Days Exceeding National 2006 Standard (Daily Standard 35 µg/m ³)	6.3	20.4	29.7	3.0	27.7
Maximum National 24-Hour Concentration (µg/m ³)	<u>42.8</u>	<u>66.7</u>	<u>94.7</u>	<u>41.6</u>	<u>86.0</u>

Notes: Underlined Values in excess of applicable standard / ppm = parts per million / µg/m³ = micrograms per cubic meter.

*Insufficient data to determine the value

**2020 is the latest year of data available as of preparation of this chapter (March 2022).

Source: California Air Resources Board 2022. *Air Quality Trend Summaries*. Accessed at <www.arb.ca.gov/adam>.

5.2.2 ODORS

The most significant source of nuisance odors from animal confinement facilities is the anaerobic decomposition of manure. Odor offensiveness varies with the moisture content of the manure. Studies have shown that pen odors have been found to increase up to 60 times under wet conditions (Augustin et al 2017).

Typically, the surface (aerobic) layer of feedlot manure and dairy waste ponds provides a physical barrier to atmospheric emission of the odors created by the underlying anaerobic layer. Further, the topography surrounding the dairy operation affects how and where odors move. Odorous air may be confined within depressions or valleys, and odors tend to move downhill under calm conditions.

Odorous air will also either go around elevated areas or be dispersed more quickly when moved over higher and varied terrain (Henry and Stowell, undated).

The four basic approaches to control odor and odorants are diet manipulation, manure treatment, capture and treatment of emitted gases, and enhanced dispersion (USDA CLAQC 2000). Vegetative barriers such as purposefully planted linear arrangements of trees and shrubs can help obstruct, modify, absorb, and/or dissipate livestock odor plumes and other emissions prior to contact with people. Baseline data has shown that vegetative barriers can contribute up to 10 percent reduction in the movement of odor downwind (Tyndall and Colletti 2007). Vegetative barriers may also provide an aesthetic benefit, and could affect how people perceive agriculture and livestock odor.

Emissions from Animal Confinement Facilities. Though animal confinement facilities emit odors, the formation of odorous compounds is dependent upon a number of independent variables, including moisture content, aerobic versus anaerobic decomposition, and other aspects of manure management, local meteorology, and diet. Thus, it is not possible to develop an odor emission factor based on the number of head. However, it is probable that odor emission rates at a particular facility could increase with expanded operations and herd size.

Health Effects: A literature search conducted for the EIR prepared and certified by Merced County for Revisions to the Animal Confinement Ordinance indicated that no scientific studies have validated adverse health effects from dairy odors, though they can be a source of great nuisance.

Existing Sensitive Uses and Receptors: There is one off-site single-family residence located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility). The closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road. There are also existing off-site residences located at farm labor housing facilities within 0.40 miles and 0.52 miles of the existing dairy, and individual off-site residences located within the urban community of Planada within 0.73 miles of the dairy (see Figure 3-7 in Chapter 3, *Project Description*). The nearest school is Planada Elementary School, located in Planada, approximately 1.65 miles south of the project site. (Impact AQ-7 evaluates the potential impacts from exposure of off-site receptors to emissions of odor.)

For the purpose of this document, **receptors** are defined as people – children, adults, and seniors – occupying or residing in:

- Residential dwellings;
- Schools;
- Daycares;
- Hospitals;
- Senior-care facilities.

Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and designated residential areas are examples of sensitive receptors.

Sensitive uses include jails, public parks, Federal or State owned and managed wildlife areas, in addition to sensitive receptors listed above.

5.3 ENVIRONMENTAL EFFECTS

5.3.1 SIGNIFICANCE CRITERIA

In accordance with Appendix G to the State CEQA Guidelines, Section III, *Air Quality*, this analysis considers impacts to be significant if implementation of a proposed action would:

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

SIGNIFICANCE THRESHOLDS

The SJVAPCD's GAMAQI (SJVAPCD 2015) has established thresholds for certain criteria pollutants for determining whether a project would have a significant air quality impact. Construction and operational emissions are calculated separately. The SJVAPCD significance thresholds are presented in Table 5-5.

Table 5-5 SJVAPCD Significance Thresholds – Criteria Pollutants			
Pollutant/Precursor	Threshold of Significance		
	Construction Emissions (tons/year)	Operational Emissions	
		Permitted Equipment and Activities (tons/year)	Non-Permitted Equipment and Activities (tons/year)
Reactive Organic Gases (ROG)	10	10	10
Oxides of Nitrogen (NO _x)	10	10	10
PM ₁₀	15	15	15
PM _{2.5}	15	15	15
Carbon Monoxide (CO)	100	100	100
Sulfur Oxide (SO _x)	27	27	27

Notes: The significance of the impacts of the emissions from construction, operational non-permitted equipment and activities, and operational permitted equipment and activities are evaluated separately. The thresholds of significance are based on a calendar year basis. For construction emissions, the annual emissions are evaluated on a rolling 12-month period.

Source: San Joaquin Valley Air Pollution Control District "Guidance for Assessing and Mitigating Air Quality Impacts" 2015.

The SJVAPCD's GAMAQI includes screening-level thresholds for construction and operational emissions to help determine when an ambient air quality analysis (AAQA) must be performed. An AAQA would entail the use of air dispersion modeling to determine whether emission increases from a project will cause or contribute to a violation of the CAAQS or NAAQS. The SJVAPCD's AAQA screening-level thresholds are 100 pounds per day of any criteria pollutant, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures; projects with emissions in excess of this threshold would require dispersion modeling, while projects below this threshold are presumed to not result in a violation of the CAAQS or NAAQS.

As used in the Health Risk Assessment (HRA), the SJVAPCD level of significance for carcinogenic risk is twenty in one million (20×10^{-6}), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0.

In relation to objectionable odors, the Merced County CEDD uses a setback approach to odor nuisance control, requiring setbacks between animal confinement facilities and other uses of 0.5-mile for urban areas and sensitive uses, and 1,000 feet for isolated rural residences. If the specified uses are within the setback distances, the County presumes an increased potential for odor nuisance conditions, though it relies on a record of odor complaints to confirm the presence or absence of nuisance conditions.

Odor modeling was not used in the evaluation of odor impacts in this EIR because it is highly subjective. Unlike HRAs and AAQAs, there is a lack of agency guidance in conducting an adequate odor model analysis. Odors can be detected within very short timeframes (on the order of seconds), and the minimum averaging period for the most-used dispersion models is one-hour, requiring the use of lesser-known and understood models, or manually adjusting the averaging period. In addition, there is a huge variability among the general population in the ability to detect odor. Since odor is a nuisance, an odor study generally uses the most conservative odor detection threshold available. Finally, it is almost impossible to change someone's perception of odors of particular uses, such as dairies, and model results will often be ignored if an individual claims the detection of a nuisance odor.

5.3.2 ENVIRONMENTAL IMPACTS

The evaluation of the Hillcrest Dairy Expansion project addresses the emissions associated with the expansion of the existing herd size from 8,050 cows to the proposed level of operations at 9,750 cows (see Table 3-3 in Chapter 3, *Project Description* of this EIR for a breakout of the herd by age-class).

The existing operation includes a dairy facility located on an approximate 200-acre portion of the dairy farm. The developed facilities include freestall barns and corrals, additional animal housing, milking parlor, commodity barn, feed storage slab, two settling basins, three wastewater storage ponds, and four mechanical manure separators and pits.

The proposed project would include the construction of supporting buildings and structures, including one new freestall barn measuring 50,000 square feet, one maternity barn measuring 13,678 square feet, three dry cow shade barns measuring 44,000 square feet each, and open heifer corrals to house 700 support stock. Proposed improvements would add approximately 195,678 square feet of new structures. Modification of the proposed facilities would occur within the existing footprint of the dairy, and there would be no change in cropped acreage associated with the farm. With implementation of the proposed project, the number of employees would remain at 50 workers. All project-related construction and operational activities would generate some level of air quality emissions, and thus are being assessed as part of this EIR.

Impact AQ-1: Construction-related emissions (Criterion III.b)

Construction activities associated with the Hillcrest Dairy Expansion project would result in short-term air emissions including ROG, CO, SO₂, NO_x, and fugitive dust. For projects in which construction related activities would disturb equal to or greater than one acre of surface area, the SJVAPCD requires implementation of an approved Dust Control Plan. This would be a significant impact.

Setting information is set forth above in this chapter regarding ozone precursors and fugitive dust, including the major sources of the pollutant; its potential for adverse environmental effects; the role of animal confinement facilities in the emissions; and potential human health effects. The San Joaquin Valley, including Merced County, is designated as a nonattainment area for federal 8-hour ozone standards, federal PM_{2.5} standards, state 1- and 8-hour ozone standards, and state PM₁₀ and PM_{2.5} standards.

Construction-related emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2020.4.0 (see Appendix G, *Health Risk Assessment and Ambient Air Quality Analysis* for construction modeling results). The individual components of construction emissions include employee trips, exhaust emissions from construction equipment, and fugitive dust emissions. The project would be constructed within two (2) years after issuance of the CUP over two phases. Construction of Phase 1 was estimated to take approximately six months, and Phase 2 was estimated to also take six months. CalEEMod default equipment for construction was used.

Table 5-6 presents an estimate of annualized construction emissions for the Hillcrest Dairy Expansion project. Construction of the proposed project would produce maximum unmitigated annual emissions of 0.18 tons of ROG, 1.49 tons of NO_x, and 0.25 tons of PM₁₀. Construction of the proposed project would not exceed the significance criteria of 10 tons/year of ROG, 10 tons/year of NO_x, or 15 tons/year for PM₁₀.

Table 5-6 Construction Related Emissions				
	ROG (tons/year)	NO_x (tons/year)	PM₁₀ (tons/year)	PM_{2.5} (tons/year)
Phase 1: 2022 Emissions ⁽¹⁾	0.11	0.88	0.11	0.07
Phase 2: 2022 Emissions	0.07	0.61	0.14	0.08
Phase 2: 2023 Emissions	0.06	0.50	0.05	0.03
Maximum Annual Emissions	0.18	1.49	0.25	0.15
SJVAPCD Significance Criteria	10	10	15	15
Criterion Exceeded?	No	No	No	n/a

Notes: Calculations completed in March 2022.

1 See CalEEMod calculation assumptions in Appendix A of the Health Risk Assessment and Ambient Air Quality Analysis included as Appendix G of this EIR. Phase 1 would include 63,678 square feet of construction, and Phase 2 would include 132,000 square feet of construction.

Source: *Insight Environmental Consultants 2022, Planning Partners 2022.*

Although the project would not exceed significance thresholds, the applicant would still be required to comply with Regulation VIII and all applicable SJVAPCD Rules and Regulations. SJVAPCD's Regulation VIII (Rule 8021) specifies control measures for PM₁₀ emissions from construction related activities, including demolition. In addition, Rule 3135 establishes a Dust Control Plan Fee, which would also be required. A summary of control measures for construction and other earthmoving activities included in Regulation VIII are as follows:

Pre-Activity:

- Pre-water site sufficient to limit Visible Dust Emissions (VDE) to 20% opacity, and
- Phase work to reduce the amount of disturbed surface area at any one time.

During Active Operations:

- Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20% opacity; or
- Construct and maintain wind barriers sufficient to limit VDE to 20% opacity.
- Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20% opacity and meet the conditions of a stabilized unpaved road surface.

Temporary Stabilization During Periods of Inactivity:

- Restrict vehicular access to the area; and
- Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in section 3.53 of Rule 8011.

Speed Limitations and Posting of Speed Limit Signs on Uncontrolled Unpaved Access/Haul Roads on Construction Sites

- Limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour.
- Post speed limit signs that meet State and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.

Wind Generated Fugitive Dust Requirements

- Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceeds 20% opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement.
 - Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so.
-

The SJVAPCD requires that animal confinement facilities obtain an ATC permit prior to initiating construction on a new facility if the facility results in emissions in excess of five tons/year of VOCs, or for expanding facilities with an existing ATC/PTO. The proposed dairy expansion project would require a new ATC and PTO from the SJVAPCD for the expanded herd and modification of the existing facilities. The project's compliance with Regulation VIII would be enforced through the ATC permit. For projects in which construction related activities would disturb equal to or greater than one acre of surface area, the SJVAPCD recommends that the County's conditions of approval require that the applicant provide a receipt of a SJVAPCD approved Dust Control Plan or Construction Notification form prior to the issuance of the first building permit.

Emissions of construction-related ozone precursors and fugitive dust would not exceed the threshold values used by the SJVAPCD. In addition, the project would be required to implement construction dust control measures and comply with SJVAPCD rules described above to reduce construction emissions. To ensure project compliance with applicable SJVAPCD Rules and Regulations, the following mitigation measure would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-1:

Prior to the release of the first-issued building permit, the applicant shall provide to the County a receipt of a SJVAPCD approved ATC permit, in addition to a Dust Control Plan or Construction Notification form in compliance with Regulation VIII – Fugitive Dust PM₁₀ Prohibitions. The animal confinement facility expansion may be subject to additional rules, including, but not limited to Rule 4570, Confined Animal Facilities, Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations), and Rule 4002 (National Emission Standards for Hazardous Air Pollutants). The project applicant will be required to implement measures of applicable SJVAPCD Rules and Regulations as noted.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Project implementation of SJVAPCD rules and regulations to be included in the SJVAPCD permit process would ensure the proposed project would not exceed construction emission thresholds.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Division of Environmental Health and the SJVAPCD shall monitor for compliance. Implementation of AQ-1 shall be implemented prior to the release of the first-issued building permit, during construction, and throughout ongoing operations.

Impact AQ-2: Carbon monoxide emissions from operational equipment and increased traffic (Criteria III.b)

Operation of equipment used at the Hillcrest Dairy Expansion for processing and farming would result in emissions of carbon monoxide. Because the magnitude of emissions from the Hillcrest Dairy Expansion would not exceed SJVAPCD significance criteria, this would be a less-than-significant impact.

Setting information regarding CO, including the major sources of the pollutant; its potential for adverse environmental effects; the attainment status of the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects, is presented in the environmental setting, above. As set forth in Table 5-2, the San Joaquin Valley air basin, including Merced County, is in attainment for CO under both state and federal standards.

Equipment such as tractors and milk trucks are used at the Hillcrest Dairy, and the use of this equipment results in exhaust emissions. On-site mobile source emissions from the feed loading tractor, manure scraping tractor, feed delivery tractor, milk tankers, solids manure removal trucks, and commodity delivery trucks would result in a minimal increase of CO emissions with the proposed expansion. Other diesel-fueled sources that would not have an increase in usage as a result of the project include the bedding delivery tractor and manure loading tractor. Additionally, the SJVAPCD has implemented Rules 4701 and 4702 regulating the operations of internal combustion engines to further reduce potential CO, ROG, and NO_x emissions.

Expanded facility operations at the Hillcrest Dairy would result in increases of vehicular traffic on local roads, and, therefore, in localized exhaust emissions. The primary source of CO emissions in California is on-road motor vehicles; this source is significant only for areas with large traffic volumes and congested intersections and roadways. Milk from the proposed project would continue to be collected from the dairy by tanker truck. Feed and commodity deliveries would result in additional truck trips to the dairy site. Since there would be no new employees associated with the proposed expansion, there would be no increase light vehicle use on the project site from employees. As estimated by the project sponsor, average daily trips (ADT) by all vehicle classes are approximately 105.1 ADT, and would increase to approximately 109.7 ADT with the proposed expansion. With low traffic volumes and generally high levels of service of rural roadways serving the site (and resulting low background concentrations of CO), the effect of CO emissions related to traffic from dairy operations at the Hillcrest Dairy Expansion is expected to be minimal.

Because of the low volumes of traffic associated with the project, and the fact that the Air Basin is in attainment for state and federal CO standards, the CO emissions associated with the traffic related to the proposed levels of operations at the project are considered to be less than significant.

Significance of Impact: Less than significant.

Mitigation Measure AQ-2: None required.

Impact AQ-3: Ozone precursor emissions from dairy operations, farm equipment, and increased traffic (Criteria III.b)

Emissions of ozone precursors (volatile organic Compounds (VOC)/Reactive Organic Gases (ROG) and Nitrogen Oxides (NO_x)) from dairy operations, farm equipment, and increased traffic from the Hillcrest Dairy Expansion project would exceed SJVAPCD emissions criteria with establishment of the dairy expansion, which could result in human health effects. This would be a significant impact.

Setting information is discussed previously in this Chapter regarding ROG/VOC and NO_x, precursors of ozone, including the major sources of the pollutants; their potential for adverse environmental effects; the role of animal confinement facilities in the emissions; and potential human health effects.

New dairies that exceed the threshold of five tons/year of VOCs or modifications to existing sources that are subject to the SJVAPCD permit requirements must obtain an ATC and PTO from the SJVAPCD, as well as undergo New Source Review (Rule 2201) requirements to determine if new emission sources trigger BACT. Farming equipment exhaust, increased vehicle exhaust, and manure management and feed are sources of ozone precursor emissions. These sources are discussed by pollutant type (NO_x or VOC) below.

Farming Equipment and Increased Traffic: Operational sources of VOC and NO_x emissions associated with animal confinement facilities include farming equipment exhaust⁷, truck exhaust, and

⁷ The ARB In-Use Off-Road Diesel Vehicle Regulation aims to reduce diesel PM and NO_x emissions from existing off-road heavy-duty diesel vehicles in California. However, vehicles used solely for agriculture are exempt from the Off-Road regulation.

employee vehicle exhaust. Vehicular traffic from the Hillcrest Dairy Expansion would generate approximately 4.6 additional ADTs from truck trips. Farming equipment such as tractors, milk trucks, back-up generators⁸, and pumps are typically used as part of dairy or other animal confinement operations, and the increased use of this equipment would contribute to an increase in exhaust emissions. Farming equipment used for crop harvesting would also result in exhaust emissions, and there would be no change in use and emissions since there would be no change in cropping activity with the proposed dairy expansion.

NO_x Emissions - The increment of increase from project mobile emissions were calculated using CalEEMod Version 2020.4.0 (see Appendix F). The increment of increase with the proposed expansion of NO_x emissions from truck trips, employee travel, and on-site mobile movement such as the feed loader would be 0.13 tons per year. The change in NO_x emissions from farm equipment was estimated using a Merced County-specific emissions factor and applying it to harvested acres (including multiple harvests per year). There would be no change in use and NO_x emissions from farm equipment since cropping would remain the same under proposed conditions. There would be an overall increase of 0.13 tons/year of NO_x emissions from vehicle trips, on-site dairy equipment, and farm equipment as a result of the proposed expansion.

VOC Emissions - Increased traffic emissions were calculated using CalEEMod Version 2020.4.0 (see Appendix F). The estimated increase of VOC/ROG emissions from traffic, on-site mobile sources, and area sources at the dairy are 0.78 tons/year. The change in VOC emissions from farm equipment was estimated using a Merced County-specific emissions factor and applying it to harvested acres (including multiple harvests per year). There would be no change in use and VOC emissions from farm equipment since cropping would remain the same under proposed conditions. The overall increment of increase of VOC emissions from vehicle trips, on-site dairy equipment, and farm equipment as a result of the proposed expansion would be 0.78 tons/year.

Manure Management and Feed:

NO_x Emissions - Most nitrogen loss from manure management occurs in the form of N₂O emissions from nitrification and denitrification of the nitrogen contained in the manure. Indirect emissions result from volatile nitrogen losses, primarily in the form of ammonia and NO_x. There are large uncertainties associated with the default emission factors of direct N₂O emissions from manure management, and similarly with NO_x emissions, since NO_x emissions from manure decomposition are highly dependent on the management system and duration of waste management (Eckard 2007).

VOC Emissions - Reactive organic gases, or VOCs, are an ozone precursor and are emitted directly from dairy cows, from the fermentation and decomposition of cattle feed, and from the decomposition of cattle manure. There are several management practices used at the Hillcrest Dairy that control emissions. For example, all animals are fed in accordance with National Research Council (NRC) guidelines to minimize undigested protein and other undigested nutrients in the manure with the result that the overall emissions NH₃ and VOCs emission with manure decomposition are reduced. As proposed by the SJVAPCD, emission reduction measures for feed handling and storage include best management practices, such as minimizing the surface area of the

⁸ The District's permitting process typically ensures that emissions of criteria pollutants from permitted equipment and activities at stationary sources are reduced or mitigated to below the District's thresholds of significance. Because there is no new permitted equipment proposed for the dairy herd expansion, there would be no change in emissions from permitted sources.

silage face exposed to the atmosphere and cleaning up residual feed to avoid decomposition and increased emissions.

Calculations of total VOC emissions from cows at the Hillcrest Dairy Expansion are set forth in Appendix F. Silage pile and Total Mixed Ration (TMR) VOC emissions flux are calculated based on the area of exposure on the silage piles and feed lanes⁹. Estimated VOC emissions from feed at the Hillcrest Dairy Expansion project are set forth in Appendix F. The dairy would continue to maintain the same number of covered silage piles with an open end. TMR was calculated based estimated area of feed per cow. VOC emissions from the feed and manure management would total 81.49 tons/year with the proposed project, with the expansion contributing 14.20 more tons/year over existing conditions. VOC emissions from all animal confinement facilities in the San Joaquin Valley are discussed in Section 12.1, *Cumulative Impacts*.

The VOC Emission Factors used in this analysis are from the dairy emissions calculator spreadsheet provided by the SJVAPCD (dated January 2020)¹⁰. Aggregated VOC emissions for all activities associated with the Hillcrest Dairy Expansion are presented in Table 5-7.

Table 5-7 Aggregated VOC/ROG Emissions			
Emission Source	Existing VOC/ROG Emissions	Proposed VOC/ROG Emissions	Increment of Increase with Proposed Expansion
Traffic, Onsite Mobile Source, and Area Sources			0.78 tons/year
Farm Equipment	1.64 tons/year	1.64 tons/year	0.00 tons/year
Feed and Manure Management	67.29 tons/year	81.49 tons/year	14.20 tons/year
Total	68.93 tons/year	83.13 tons/year	14.98 tons/year
SJVAPCD Significance Criterion			10 tons/year
Criterion Exceeded?			YES

Source: Planning Partners, 2022. See Appendix F of this EIR.

Summarily, NO_x emissions from expanded project operations for mobile source and farm equipment would result in a net increase of 0.13 tons/year of NO_x emissions from existing conditions. The increment of increase in VOC emissions associated with the proposed expansion would be 14.98 tons/year over existing operations. The proposed dairy expansion would trigger New Source Review and application of BACT, and an ATC/PTO would be required prior to the initiation of construction. As part of the PTO, the dairy operator would be required to submit an ATC/PTO application detailing an emission mitigation plan listing all chosen BACT/BARCT mitigation measures. The SJVAPCD would then consider implementation of the selected mitigation measures as conditions of the ATC permit required by District Rule 2201. The menu of potential mitigation measures that could apply to the proposed dairy expansion is included in Appendix D of this EIR. Chapter 18.64.050 U of the ACO (see Appendix C) applies to this impact, which includes

⁹ For the purposes of this analysis, it is assumed that there would only be one open silage face for each silage type at a given time.

¹⁰ The Hillcrest Dairy is currently required to comply with all applicable mitigation measure requirements of SJVAPCD Rule 4570, which are expected to result in VOC emissions reductions. These mitigation measures as identified by the SJVAPCD, and the expected control measure for each, are included in calculations for existing and proposed operations.

compliance with requirements of the SJVAPCD and required reduction of air emissions, including PM₁₀ and ROG.

In order to mitigate significant air quality impacts from a project, the SJVAPCD may enter into a Voluntary Emission Reduction Agreement (VERA) with a project applicant. A VERA is a program in which a project applicant provides a pound-for-pound mitigation of project-specific emissions by providing funds for SJVAPCD emission reduction projects. In implementing a VERA, the SJVAPCD verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. Merced County supports the SJVAPCD in its use of a VERA as reduction measure to lessen impacts on air quality. The 2030 Merced County General Plan includes Policy AQ-6.8: Voluntary Emissions Reduction Agreement, in the General Plan, which encourages project applicants to consult with the SJVAPCD regarding the establishment of a VERA. Consistent with General Plan Policy AQ-6.8, Mitigation Measure AQ-3b below would be required.

Human Health Effects

As described in the Environmental Setting of this chapter, exposure to criteria pollutant emissions can cause human health effects. Potential health effects vary depending primarily on the pollutant type, the concentration of pollutants during exposure, and the duration of exposure. Air pollution does not affect every individual in the population in the same way, and some groups are more sensitive than others to adverse health effects. However, using the SJVAPCD emissions threshold is not amenable to determining project level assessments of human health effects. Air districts have focused on reducing regional emissions from all sectors to meet the health-based concentration standards, thereby reducing the pollutant specific health impacts for the entire population. As set forth above, the SJVAPCD has prepared plans to attain and maintain the ozone and particulate matter ambient air quality standards. These attainment plans include emissions inventories, air monitoring data, control measures, modeling, future pollutant-level estimates, and general health information. Attainment planning models rely on regional inputs to determine ozone and particulate matter formation and concentrations in a regional context, not a project specific context. For an analysis of the potential for localized health impacts, see Impacts AQ-5 and AQ-6 regarding hazardous air pollutants and health risk.

As described in the introduction to this chapter, ROG/VOC and NO_x are precursors to ozone, increased concentrations of which can cause health effects generally associated with reduced lung function. The contribution of VOCs and NO_x to a region's ambient ozone concentrations is the result of complex photochemistry. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In other words, because of the complexity of ozone formation, the pounds or tons of emissions from a proposed project in a specific geographical location does not equate to a specific concentration of ozone formation in a given area, because in addition to emission levels, ozone formation is affected by atmospheric chemistry, geography, and weather. Because air district attainment plans and supporting air model tools are regional in nature, they do not allow for analysis of the health impacts of specific projects on any given geographic location.

In contrast to attainment models, CalEEMod, one of the models used for this CEQA air quality analysis, is designed to calculate and disclose the mass emissions expected from the construction and operation of the proposed dairy expansion project (tons/year). The estimated emissions are then

compared to SJVAPCD significance thresholds, which are in turn keyed to reducing emissions to levels that will not interfere with the region's ability to attain the Federal and State ambient air quality standards. This protects public health in the overall region, but there is currently no methodology to determine the impact of emissions on concentration levels in specific geographic areas in the San Joaquin Valley. The SJVAPCD currently does not have a methodology that would provide Lead Agencies and CEQA practitioners with a consistent, reliable, and meaningful analysis to correlate specific health impacts that may result from a proposed project's mass emissions. Therefore, the analysis of direct health impacts due to VOC emissions from the proposed dairy expansion is not yet feasible.

Summary

Because the proposed dairy expansion project would result in an increase of VOC emissions that would exceed the SJVAPCD significance thresholds and could result in human health effects, the project-level impact would be significant. Because the Air Basin is in nonattainment for both federal and state ozone standards, and VOCs and NO_x are ozone precursors, these emissions would be considered cumulatively significant (see Section 12.1, *Cumulative Impacts*).

Significance of Impact: Significant.

Mitigation Measure AQ-3a:

The proposed dairy expansion would exceed SJVAPCD permit thresholds for VOC/ROG emissions; therefore, in order to reduce emissions, prior to the initiation of operations, the applicant shall implement all air quality provisions of the ACO, including Chapter 18.64.50 U; comply with all applicable SJVAPCD Rules including but not limited to: Rule 2010 – apply for an Authority to Construct/Permit to Operate; Rule 2201 New Source Review; Rule 4570, Confined Animal Facilities; implement BACT/BARCT mitigation measures appropriate for this dairy operation to be developed during permit review in cooperation with SJVAPCD staff, including but not limited to all applicable measures in Appendix D of this EIR; and Rules 4701 and 4702, Internal Combustion Engines.

Mitigation Measure AQ-3b:

Because project emissions have been evaluated to exceed SJVAPCD significance thresholds, the project applicant shall consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Consultation shall occur prior to issuance of building permits, and documentation of consultation with the SJVAPCD shall be provided to the County.

Potential Environmental Effects of Measures: On-site facilities necessary to comply with the ACO and SJVAPCD requirements would be constructed within the overall facility footprint of the Hillcrest Dairy Expansion as assessed in Chapters 5-11 of this EIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Even after imposition of the identified mitigation measure, this would be a significant and unavoidable impact for the following reasons: the BACT/BARCT measures required by the above Mitigation Measure AQ-3a may not be sufficient to reduce project ROG emissions below the threshold of significance; the Voluntary Emissions Reduction Agreement encouraged in Mitigation Measure AQ-3b may not be required by the SJVAPCD, and therefore may not reduce project ROG emissions below the threshold of significance; and the San Joaquin Valley

Air Basin is in nonattainment for both federal and state ozone standards. The ultimate success of implementing Mitigation Measure AQ-3b is contingent on a favorable negotiation between a project applicant and the SJVAPCD; however, Merced County is unable to control the outcome of the negotiation, and hence the effectiveness, of the measure. Further, since Merced County would not be a party to negotiations between the project applicant and the SJVAPCD, the County could not be assured that a VERA could successfully be accomplished within a reasonable period of time, and it would be considered infeasible for the County to require establishment of a VERA.

Implementation and Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and San Joaquin Valley Air Pollution Control District shall monitor for compliance. Mitigation Measure AQ-3a shall be implemented prior to final inspection or prior to initiation of new operations and throughout ongoing operations. Mitigation Measure AQ-3b shall be implemented prior to issuance of a building permit and throughout ongoing operations.

Impact AQ-4: PM₁₀ and PM_{2.5} emissions from fugitive dust during project operations (Criteria III.b)

Operations at the Hillcrest Dairy Expansion would result in fugitive dust (PM₁₀ and PM_{2.5}) emissions from wind erosion, farming operations, animal movement in unpaved corrals, vehicle use along unpaved driveways and access roads, and equipment operation. Because pollutant concentrations would not exceed SJVAPCD emissions thresholds, this would be a less-than-significant impact.

Setting information regarding particulate matter, including the major sources of the pollutant; its potential for adverse environmental effects; the role of animal confinement facilities in the emissions; and potential human health effects, is presented in the Setting above. For an evaluation of the project potential to impact ambient air quality through a violation of any air quality standard or a substantial contribution to an existing or projected air quality standard, see Impact AQ-6.

As discussed in detail in the following paragraphs, several sources of particulate matter emissions are associated with animal confinement facilities: wind erosion, farming operations, farming equipment exhaust, traffic on unpaved roadways, and animal movement. Calculation spreadsheets are included in Appendix F. Various management practices are used at this dairy to control PM emissions. The dairy uses a flush system with recycled water to clean the milk barn, which minimizes PM emissions. Bi-weekly scraping of the corrals minimizes loose dirt and manure in the pens, and concrete lanes in the barns reduce PM emissions since the cows are on a paved surface instead of loose dirt, and flushing of the concrete lanes to remove manure also minimizes PM emission.

Wind Erosion: Wind erosion from land cultivation produces PM₁₀ and PM_{2.5} emissions. Research from the ARB has led to emission factor estimates that would be appropriate for application to this project. The Hillcrest Dairy has approximately 1,611 acres in farming operations that are currently being exposed to cultivation and occasional wind erosion under existing conditions, and 1,611 acres under proposed conditions. Based on existing and proposed cropping patterns and multiple harvests, the existing project operations would generate 16.95 tons/year of PM₁₀ and 2.92 tons/year of PM_{2.5} from wind erosion, and there would be no change with proposed project operations (see Appendix F for calculations and assumptions).

Farming Operations: Land preparation and harvesting produces PM₁₀ emissions. Research from the ARB has led to emission factor estimates that would be appropriate for application to this project. There are different emission factors for land preparation and for harvesting according to crop type as shown in Appendix F. By applying these crop-specific emission factors to the existing cropped acreage for the Hillcrest Dairy operation, estimated emissions from land preparation and harvesting for existing operations are 10.95 tons/year of PM₁₀ and 0.26 tons/year of PM_{2.5}. Estimated emissions from land preparation and harvesting for proposed operations would be the same as existing (see Appendix F).

Farming Equipment and Increased Traffic: On-site mobile sources of exhaust emissions include a feed loading tractor, a manure scraping tractor, a feed delivery tractor, milk tankers, solids manure removal trucks, and commodity delivery trucks. Other diesel-fueled sources that would not have an increase in usage as a result of the project are bedding delivery tractor and manure loading tractor. Emissions could also occur from vehicle travel on paved and unpaved roads. Based on mobile source calculations in CalEEMod, the proposed dairy expansion traffic operations would result in an increment of increase of 0.01 tons/year of PM₁₀.

Animal Movement: Emissions attributed to animal movement were estimated using PM₁₀ emission factors currently used by the SJVAPCD (see Appendix F of this EIR). Based on these emissions factors, the proposed Hillcrest Dairy Expansion would result in an incremental increase of 3.58 tons/year of PM₁₀.

Dry Manure Application: Additionally, spreading dry manure on cropped fields creates PM₁₀ emissions. Dry manure is currently applied on 330 acres (165 acres double-cropped), which results in approximately 0.84 tons/year of PM₁₀. With the proposed expansion, dry manure would be applied to 165 acres (single-cropped) under proposed conditions, which results in approximately 0.42 tons/year of PM₁₀. Impacts from the application of dry manure from the proposed dairy herd expansion at off-site locations are discussed in Section 12.1, *Cumulative Impacts*.

Aggregated PM₁₀ emissions for all activities associated with the Hillcrest Dairy Expansion are presented in Table 5-8.

Table 5-8 Aggregated PM₁₀ and PM_{2.5} Emissions for Project-Specific Activities for the Proposed Dairy Expansion

Emission Source	Project Increase of PM ₁₀ Emissions (tons/year)	Project Increase of PM _{2.5} Emissions (tons/year)
Wind Erosion	0.00	0.00
Farming Operations	0.00	0.00
Traffic, On-site Mobile Source	0.01	0.01
Animal Movement	3.58	--
Dry Manure Application	-0.42	--
Total	3.17	0.01
SJVAPCD Significance Criterion	15 tons/year	15 tons/year
Criterion Exceeded?	NO	NO

Source: Planning Partners, 2022.

As shown above, the increment of increase of particulate matter emissions would not exceed SJVAPCD significance criteria for PM₁₀ or PM_{2.5}.

SJVAPCD Rule 4550 includes dairies, other animal confinement facilities, and other on-field farming operations. As mentioned above, Rule 4550 requires the preparation of CMP plans to reduce PM₁₀ emissions. This rule applies to agricultural operators with more than 100 contiguous acres, including the Hillcrest Dairy. Unpaved roads with traffic volumes greater than 75 vehicles per day (but not internal farm roads or roads with average daily traffic volumes fewer than 75 vehicles) are subject to SJVAPCD regulation.

Chapters 18.64.050 U and HH of the ACO (see Appendix C) apply to this impact, which includes compliance with requirements of the SJVAPCD, dust control measures for unpaved roadways, and required reduction of air emissions, including PM₁₀ and ROG. The dairy BACT/BARCT mitigation requirements presented in Appendix D would apply to the proposed project for required measures, and could be made conditions of the SJVAPCD's permit approval of the dairy for feasible measures.

While the Merced County portion of the San Joaquin Valley Air Basin has been classified as non-attainment for PM₁₀ under the established CAAQS, the expanded operations of the proposed dairy are not predicted to exceed SJVAPCD significance thresholds, and this would be considered a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure AQ-4: None required.

Impact AQ-5: Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations (Criterion III.c)

The proposed dairy expansion would be a potential source of hazardous air pollutants from construction activities, animal movement, manure management, land application of wastewater, and on-site mobile sources. However, the proposed project would not exceed health risk thresholds, and this would be a less-than-significant impact.

Proposed modifications to the dairy would result in emissions of hazardous air pollutants and would be located near existing residences; therefore, an assessment of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed dairy expansion is required. The HRA prepared for the Hillcrest Dairy Expansion project assesses the potential risk to the adjacent residents and workers attributable to emissions of hazardous air pollutants from construction and operation of the proposed dairy (see Appendix G¹¹).

Pursuant to guidance provided by the SJVAPCD, emissions based on the current configuration of the dairy are considered to be existing emissions. Based on this guidance, the facility's existing emissions are not considered as part of the evaluation of the proposed dairy expansion. Emissions from the dairy expansion have been restricted to incremental emissions from construction activities, animal

¹¹ Calculations for this Appendix were completed in February 2022.

movement, manure management, and land application of wastewater based on the proposed increase in the number of cattle and the additional on-site mobile sources required for the expansion.

The HRA addresses emissions from: ammonia; hydrogen sulfide; particulate matter and its toxic components (e.g., aluminum, lead, manganese, nickel, etc.); and xylenes, formaldehydes, carbon tetrachloride, and other components from VOCs (see Appendix G for the list of toxic substances emitted from project activities and classification of these substances as to their potential for producing carcinogenic and non-cancer acute or chronic health impacts). The toxic air pollutants of greatest concern are those that cause serious health problems or affect many people. Health problems can include cancer, respiratory irritation, nervous system problems, and birth defects. Toxic Air Contaminants (TAC) emissions of concern from construction activities would include the diesel particulate matter (DPM) emissions from on-site construction equipment exhaust.

Construction equipment sources include diesel-fueled dozers, loaders, backhoes, excavators, graders, cranes, forklifts, generator sets, concrete/industrial saws, and welders. Operational mobile sources include a diesel-fueled feed loading tractor, a manure scraping tractor, a feed delivery tractor, milk tankers, solids manure removal trucks, and commodity delivery trucks. The increased herd size will require additional tractor use for feed loading and delivery, and manure scraping. Additional truck trips will be required for solid manure removal trucks, milk tankers, and commodity delivery trucks. Other diesel-fueled sources that would not have an increase in usage as a result of the project are bedding delivery tractor and manure loading tractor. There will also be emission increases from the housing barns and pens, milk barn, lagoons, solid manure storage, and land application areas associated with increased herd size.

Emissions of hazardous air pollutants attributable to proposed increases in construction activities, animal movement, manure management, and on-site mobile sources were calculated using generally accepted emission factors and the CalEEMod version 2020.4.0. Ambient air concentrations were predicted with dispersion modeling (using the most recent version of the EPA's AMS/EPA Regulatory Model – AERMOD) to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over a 70-year lifetime. Similarly, concentrations of compounds with non-cancer adverse health effects were used to calculate hazard indices (HI), which are the ratio of expected exposure to acceptable exposure. Appendix G includes complete details on pre-project and post-project cattle and housing locations.

A total of 673 off-site receptors¹² of residences and agricultural workers were assessed during the preparation of the HRA (see Table 4-3 of Appendix G, *Health Risk Assessment and Ambient Air Quality Analysis*, for coordinates of residences included as maximum impact receptors in the model).

Cancer risks are primarily attributable to breathing into the lungs emissions of naphthalene from animal movement. Acute non-cancer hazard risks are primarily attributable to emissions of ammonia, which affects the respiratory system and eyes. Chronic non-cancer hazard risks are primarily attributable to emissions of arsenic and affect the cardiovascular, central nervous, reproductive, respiratory and skin systems.

¹² For the purpose of this document, **receptors** are defined as people – children, adults, and seniors – occupying or residing in: Residential dwellings; Schools; Daycares; Hospitals; and Senior-care facilities. **Sensitive receptors** are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and designated residential areas are examples of sensitive receptors.

The SJVAPCD has set the level of significance for carcinogenic risk to twenty in one million (20×10^{-6}), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0. With implementation of SJVAPCD-approved control measures, the maximum predicted cancer risk among the modeled receptors is 3.54 in one million, which is below the significance level of twenty in one million. The maximum predicted acute and chronic non-cancer hazard indices among the modeled receptors are 0.055 and 0.031, respectively, which are below the significance level for chronic and acute significance level. (The maximum excess cancer risk, acute non-cancer HIs, and chronic non-cancer HIs are provided in Tables 4-3 through 4-6 of Appendix G.) Compliance with SJVAPCD Rules 4565 and 4570 during the permitting process would further reduce ammonia concentrations. To ensure the implementation of SJVAPCD-approved control measures, the following mitigation would be required.

Significance of Impact: Less than significant.

Mitigation Measure AQ-5: None required.

Impact AQ-6: Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants (Criterion III.c)

Operations at the Hillcrest Dairy Farm Expansion would result in emissions of criteria air pollutants that could impact ambient air quality through a violation of air quality standards. However, the project would not exceed screening level thresholds for construction and operational activities that would affect ambient air quality standards in areas adjacent to the dairy. This would be a less-than-significant impact.

As described above, the SJVAPCD has developed screening levels for requiring an AAQA. The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100 pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

Emissions of criteria pollutants attributable to proposed construction activities, animal movement, manure management and on-site mobile sources were calculated using generally accepted emission factors. As shown in Table 3-1 of Appendix G, average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day for any criteria pollutant that has an ambient air quality standard. Therefore, an AAQA is not required, and the proposed dairy expansion is considered less than significant for ambient air quality impacts.

Significance of Impact: Less than significant.

Mitigation Measure AQ-6: None required.

Impact AQ-7: Adverse odor from project operations (Criterion III.d)

Operations and manure management at the Hillcrest Dairy Expansion in Merced County may emit odors that may be bothersome to nearby sensitive persons and uses, including the residents of rural

residences or residences located in the community of Planada. Because there have been previous nuisance odor complaints for the existing dairy, and because of the proximity of residences to existing and proposed active animal confinement facilities, there is an increased potential for nuisance conditions, and this would be a significant impact.

Adverse levels of odor could potentially affect several classes of land uses. These include:

- Urban areas;
- Land uses where the residents/occupants have no choice about the location of the use and cannot move to another location (schools, hospitals, jails, etc.);
- Areas where past actions of the County have provided reasonable expectations of urban levels of land use compatibility (residentially zoned or designated districts in otherwise rural areas, and/or groups of residences in rural areas developed at urban densities);
- Isolated rural residences constructed in Agricultural zones;
- Parks, other public and private designated or permitted recreation facilities; and,
- Wildlife refuges.

As discussed in Chapter 3, *Project Description*, there is one off-site rural residence located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility) (see Figure 3-4 in Chapter 3, *Project Description*). The closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road (see Figure 3-7 in Chapter 3, *Project Description*). The unincorporated urban community of Planada boundary is located approximately 0.73 miles (3,850 feet) south of the dairy (see Figure 11-1 in Chapter 11, *Land Use Compatibility*). There are two farm labor housing facilities located along North Plainsburg Road, the nearest one located approximately 0.40 miles west of active dairy facilities. There are no protected habitat areas, such as wildlife refuges or wildlife management areas, within one mile of the project site.

Odors associated with dairy and other animal confinement operations are primarily generated from manure and silage. The odor characteristics that contribute to nuisance conditions include the intensity, concentration, or strength of the odor, the odor frequency, the duration that the odor remains detectable, and the perceived offensiveness and character or quality of the odor. The four basic approaches to control odor and odorants are diet manipulation, manure treatment, capture and treatment of emitted gases, and enhanced dispersion.

Unlike the other air pollutants evaluated in this section, odor does not have generally accepted methods of measurement or allowable concentration, and its offensiveness differs among individuals. For these reasons, Merced County has sought to prevent nuisances by the use of setbacks between potential sources of offensive odors and adjoining sensitive land uses, rather than regulating the concentration of odor-producing compounds. Under existing regulations, Merced County enforces a setback of 0.5-mile from animal confinement facilities to specified urban uses, parks, and wildlife refuges, and a minimum of 1,000 feet between animal confinement facilities (ponds, corrals, barns) and rural residences.

The County has maintained and reinforced land use policies to protect agricultural production in designated agricultural areas. Since the late 1960s, the County Zoning Code has regulated land uses in the County to maintain areas zoned for Agricultural uses in agricultural production. The County's 1978 General Plan introduced the Specific Urban Development Plan designation (now called Urban Community) whereby the County directed urban growth to occur in urban areas, with rural areas

reserved for agricultural production. The 1984 Agricultural Element of the General Plan further refined the County's Urban Centered Concept for managing urban and rural uses. This land use concept, which has been the land use policy in Merced County since the 1978 General Plan, directs anticipated urban growth to cities, unincorporated communities, or established population centers. In the 2030 General Plan, such centers are designated as City Planning Area, Rural Residential Center, Rural Center, Urban Community, Highway Interchange Center, and Isolated Urban Areas. A primary purpose of the Urban Centered Concept is to reduce conversion of productive agricultural land, including animal confinement facilities, to urban uses.

As discussed in Chapter 11, *Land Use Compatibility*, there are no off-site residences located within 1,000 feet of the existing dairy facility. The existing separation distance to the Planada urban community boundary (0.73 miles) is consistent with ACO requirements of one-half mile (Merced County Code Chapter 18.64.040 (B)(1)(a)). While some of the residences in the farm labor housing facility are located less than the one-half mile (0.40 miles) setback specified by the ACO, the existing separation distance would not be decreased in accordance with Merced County Code Chapter 18.64.040 (B)(2).

In the past five years, DEH received several complaints from 2016 to 2019 regarding odors from the Hillcrest Dairy (Merced County 2022). DEH visited the site in response to odor complaints, but the condition could not be confirmed. Since 2019, there has been one additional odor complaint reported to DEH in May 2022. The odor complaint was not confirmed.

The SJVAPCD received a number of odor complaints on the Hillcrest Dairy from 2017 to 2021 (SJVAPCD 2022), with the most complaints occurring in 2017 and 2019. In most instances, the complainant simply requested to log the complaint, and no inspection by the SJVAPCD was completed. During that five-year period, there were three site investigations completed by a representative of the SJVAPCD in response to a complaint; the complaint of odor was validated on only one of those three occasions.

Since odors from agricultural operations are exempt from SJVAPCD Rule 4102: Nuisance, none of the complaints resulted in a violation or District enforcement action. During the most recent inspections of the existing Hillcrest Dairy (2018 and 2019), the facility was found to be in compliance with SJVAPCD regulations, and no emissions violations or nuisance conditions were reported (SJVAPCD 2022).

In addition, comments from a nearby resident submitted on the Notice of Preparation for the project indicated a concern for increased odors at the Hillcrest Dairy.

Chapters 18.64.050 (H), 18.64.060 (C)(8)(a), and 18.64.040 (B)(1) of the ACO (see Appendix C of the EIR) address potential odor impacts, and require preparation of an odor management plan, which has been completed by the dairy applicant. Additionally, the nuisance requirements and protocols set forth in the Merced County Code regarding odor nuisances would apply. Summarily, if an odor nuisance condition were reported, as required by the ACO, DEH would implement the following procedures:

- A. If nuisance conditions are reported to the DEH, the Division shall take the following actions:

Within 72 hours of receiving a complaint, the DEH shall determine whether an odor exists during an inspection of the location of the complaint, and identify potential sources of odor in the vicinity. If a confined animal facility is identified as a potential source of the odor nuisance, the County will evaluate the affected facility and identify sources of the odor. In the event of odor causing a nuisance, the County will impose additional control measures on a site-specific basis. Measures that may be required by DEH include the operational measures set forth above.

- B. If odor nuisance conditions are confirmed, and are attributable to operations at a confined animal facility, the DEH shall require the owner/operator to remedy the nuisance condition within a specified period of time. The Division shall notify the parties reporting the nuisance of its findings, and shall provide follow-up inspections to ensure that the nuisance condition is cured. Should the condition persist, the Division shall initiate an enforcement action against the offending operator.

In response to the history of odor complaints, the project applicant has completed an Odor Control Plan for the dairy facility as part of the proposed dairy expansion project application. Further, in the past five years, the project applicant has planted pistachio orchards south of the dairy facility and directly north of Planada. These pistachio trees will continue to grow and assist with odor dispersal, should odor events occur. The following best management practices would be implemented as part of that Plan to control odors:

- Liquid manure utilized for irrigation purposes will be managed so that it does not stand in the application field for more than 24 hours.
- Odor control measures will be implemented, including:
 1. Ration/diet manipulation
This approach involves the alteration of feed in order to reduce the volume of substrate available for anaerobic activity. The activity includes reducing the nitrogen content of feed ration, phase feeding, repartitioning agents, improved animal genetics, and various feed additives.
 2. Manure management
Use best management practices for manure management, including minimizing the time between animal excretion and application.

Additionally, the following additional best management practices will be implemented:

Manure Collection Areas

- Clean out manure generated at the freestall barns by flushing lanes 3x/day and clean corrals at least twice a year, or more frequently as necessary to minimize odors;
- Keep cattle as dry and clean as possible at all times;
- Scrape manure from the corrals and bedding from the freestall barns at a frequency that would reduce or minimize odors.

Manure Treatment and Application

- Minimize moisture content of stockpiled manure/retained solids to a level that will reduce the potential for release of odorous compounds during storage;
- Minimally agitate stockpiled manure during loading for off-site transport;

- Mix process water with irrigation water prior to irrigation (dilution rate will be adequate to minimize odor levels and maintain appropriate nutrient content in effluent);
- Clean up manure spills upon occurrence;
- Maintain and operate wastewater storage ponds to minimize odor levels.

General

- Implement dust suppression measures to prevent the release of odorous compound-carrying fugitive dust.

Operational measures to control flies included in the Vector Control Plan described in Impact HAZ-1 in Chapter 9, *Nuisance Conditions from Insects*, will also reduce odors at the Hillcrest Dairy facility.

As set forth in the Odor Control Plan, the dairy operator will provide a point of contact to residents within the windshed of the dairy should nuisance odors occur. The dairy operator/owner will respond to neighbors who are adversely affected by odors generated at the project site and take prompt corrective action. These actions will include confirmation that all measures described above have been implemented effectively. If necessary and feasible, the Hillcrest Dairy operators will implement the following additional measures:

1. Manure treatment
Manure treatment methods include maintaining aerobic conditions during storage, and biochemical treatment.
2. Capture and treatment of emitted gases
This approach includes timely incorporation of applied liquid or solid manure.
3. Enhanced air dispersion
Odor and other air contaminants are diluted to below threshold levels by atmospheric turbulence that increases with wind velocity, solar radiation, and roughness elements such as buildings, trees, or barriers. Additional dispersal barriers between the source of odors and the odor receptor could be necessary.
4. Enhanced land spreading procedures
Procedures may be modified to minimize impacts by avoiding spreading when the wind is blowing towards populated areas, employing technologies to incorporate manure into soil during or directly after application (i.e. injection, plowing, disking), or spreading manure in thin layers during warm weather.

While the Odor Control Plan includes a point of contact for neighbors within the windshed, the Plan does not identify other residents within sensitive area setbacks beyond the windshed as set forth by the County in the ACO.

Because there have been previous nuisance odor complaints for the existing dairy, and because of the proximity of residences to existing and proposed active animal confinement facilities, there is an increased potential for nuisance conditions, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-7a:

The applicant has prepared an Odor Control Plan, which has been submitted to the Merced County Division of Environmental Health. The applicant shall continue to implement all measures within the approved Odor Control Plan throughout the active life of the dairy.

Mitigation Measure AQ-7b:

The project applicant shall revise the Odor Control Plan to include all neighbors within the windshed and sensitive area setbacks to be provided with a point of contact for nuisance complaints at the dairy facility. The applicant shall inform all neighbors within the windshed and sensitive area setbacks of the facility of methods to contact this individual in the event of nuisance conditions. This will allow the dairy operator the opportunity to immediately remedy the nuisance conditions without waiting for the DEH to inspect and confirm odor nuisance conditions. In addition, the applicant/dairy operator shall maintain a record of complaints received, and make them available for review by DEH upon request. Nuisance complaints shall include the following information: (1) The nature of the complaint; (2) The date the complaint was received; (3) If available, the name, address, and telephone number of the person(s) making the complaint; and (4) The actions taken by the operator in response to the complaint.

Mitigation Measure AQ-7c:

The applicant shall implement the nuisance control measures set forth in the Vector Control Plan and required in Mitigation Measure HAZ-1. The nuisance control measures include best management practices and manure management measures that would also act to control odors.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Implementation of the foregoing measures would reduce the magnitude of this potential effect by requiring implementation of additional housekeeping and management measures. While there may be an increased potential for nuisance conditions with the dairy expansion, the project applicant has provided increased measures to control odors, including a point of contact in the event of odors in order to immediately remedy the situation. Further, the proposed expansion would not reduce the setback distances specified by the ACO, and with implementation of the above mitigation measures, the potential impact from odors would be reduced to less than significant.

Implementation/Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Division of Environmental Health shall monitor for compliance. Mitigation Measure AQ-7a shall be implemented throughout ongoing operations; and Mitigation Measures AQ-7b and AQ-7c shall be implemented: prior to issuance of a building permit and throughout ongoing operations (MM HAZ-1).

Impact AQ-8: Conflict with or obstruct implementation of the applicable air quality plan (Criterion III.a)

Implementation of the Hillcrest Dairy Expansion project would not conflict with or obstruct implementation of the SJVAPCD air quality attainment plan. For this reason, the impact would be less than significant.

As stated above in the regulatory environment, for nonattainment criteria pollutants, the SJVAPCD has attainment plans in place that identify strategies to bring regional emissions into compliance with federal and state air quality standards. Projects and uses that are consistent with the assumptions used to develop the plans, and implement strategies to implement the plans, would not jeopardize attainment of the air quality levels identified in the plans.

Local General Plan land use designations and population projections form the basis of SJVAPCD attainment planning. The proposed Hillcrest Dairy Expansion is a use consistent with the 2030 Merced County General Plan land use designation of the project site and area used to generate air emission projections incorporated into the SJVAPCD attainment plans. Thus, implementation of the project would not conflict with the assumptions and emissions estimates contained within the plans as approved by the ARB and the EPA. The SJVAPCD regulates air emissions at the Hillcrest Dairy through its ATC/PTO permit process, and has required operational mitigation measures to reduce air emissions at the dairy.

While the proposed project would contribute to regional emissions, because the proposed uses are consistent with Merced County's land use designation for the site, and the project would comply with applicable rules and regulations of the SJVAPCD as described above, the proposed project would not conflict with or obstruct implementation of any SJVAB attainment plan or the SIP.

Significance of Impact: Less than significant.

Mitigation Measure AQ-8: None required.

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6 BIOLOGICAL RESOURCES

This chapter provides an evaluation of potential impacts to nesting birds associated with ground disturbance during construction of the proposed Hillcrest Dairy Expansion project. Comments received during circulation of the Initial Study/Notice of Preparation (IS/NOP) suggested that further evaluation of this topic in the Environmental Impact Report (EIR) would be necessary. Although abbreviated compared to the analyses in Chapters 5 through 11, the analyses in this chapter are structured similarly, with a discussion of the environmental setting (including pertinent local policies), followed by an environmental evaluation.

The evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the 2030 Merced County General Plan EIR in addition to the EIR for Revisions to the Animal Confinement Ordinance (ACO) and its approval of the ACO.

6.1 ENVIRONMENTAL SETTING

The proposed project area consists primarily in agricultural lands. Dairy operations occur within a relatively flat and graded area on bare and exposed soil within the existing dairy footprint. The existing Hillcrest Dairy and the site of the proposed expansion are located on approximately 200 acres of a 2,290-acre site. Approximately 1,611 acres of the project site are currently used for the production of crops, and of this, approximately 1,147 acres are used for the application of manure process water.

Research on the avian resources associated with the proposed project included a query of the California Natural Diversity Database (CNDDB) (April 5, 2022) to identify occurrences of special status bird species within 2 miles of the proposed dairy construction. No special status avian species occurrences were identified within this survey area.

A detailed discussion of the relevance of Merced County goals and policies designed to protect biological resources to the proposed project is located within Tables 11-1 and 11-2 of Chapter 11, *Land Use Compatibility*, of this EIR.

6.2 ENVIRONMENTAL EFFECTS

6.2.1 SIGNIFICANCE CRITERIA

The project was evaluated in terms of findings of significance defined in State CEQA Guidelines Section 15065, and Appendix G of the State CEQA Guidelines Section IV, Biological Resources. This section includes additional evaluation of the following resource topics:

- 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 California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service. (*IV.a*)
- 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. (*IV.d*)

Additional biological resource assessment criteria previously evaluated in the project IS/NOP was whether the project would:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS. (IV.b)
- Have a substantial effect on state or federally protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct filling, hydrological interruption, or other means. (IV.c)
- Conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance. (IV.e)
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approval local regional or state habitat conservation plans. (IV.f)

These impacts were found to be less than significant or no impact and will not be evaluated further in this chapter.

6.2.2 ENVIRONMENTAL IMPACTS

Impact BIO-1: Nest Disturbance for Swainson's hawk (Criterion IV.a)

Implementation of the proposed Hillcrest Dairy Expansion project would result in construction activities that could affect nests and nesting birds. Because the state-threatened Swainson's hawk may nest in the project vicinity, construction noise and activity could disrupt breeding activities of the hawk, and this would be a significant impact.

The state-threatened Swainson's hawk is known to occur in the project area. According to the California Department of Fish and Wildlife (CDFW) Staff Report regarding Mitigation for Impacts to Swainson's Hawks (CDFW 1994), the following vegetation types are considered to provide small mammal and insect foraging habitat for Swainson's hawks: alfalfa; fallow fields; beet, tomato, and other low-growing row or field crops; dry-land and irrigated pasture; rice land (when not flooded); and cereal grain crops (including corn after harvest). The project area cropland provides foraging habitat for small ground dwelling mammals, which are prey species for raptors. However, construction of the proposed dairy facilities would occur within the existing dairy footprint, and would not convert cultivated farmland to dairy facilities.

Based on aerial photography, there are trees within the larger project area, but not within the project site that would be disturbed by construction that may provide potential nest sites for Swainson's hawk. Construction activities within the existing footprint of the Hillcrest Dairy would result in noise, groundwork, and movement of workers that could affect nesting and has the potential to result in nest abandonment and reduced nesting success of Swainson's hawk.

Due to the proximity of suitable nesting habitat, noise and motion associated with construction activities in the vicinity of Swainson's hawk nesting areas could disrupt breeding activities. Therefore, project impacts to Swainson's hawk nesting activities would be considered significant.

Significance of Impact: Significant.

Mitigation Measure BIO-1:

1. **Protocol Surveys:** For work that begins between March 1 and August 30 of any year in which construction is planned to occur, a qualified biologist with expertise in Swainson's hawk shall conduct protocol surveys of potential nesting habitat within 0.5 mile of any earth-moving activities prior to initiation of such activities. The project applicant shall conduct a protocol-level survey in conformance with the "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley," Swainson's Hawk Technical Advisory Committee (<https://www.wildlife.ca.gov/conservation/survey-protocols#377281284-birds>) (May 31, 2000) hereby incorporated by reference. This protocol prescribes minimum standards for survey equipment, mode of survey, angle and distance to tree, speed, visual and audible clues, distractions, notes and observations, and timing of surveys. If construction work begins after August 30 and ends before March 1 (outside of the breeding season), impacts to the Swainson's hawk would be avoided. Surveys would not be required for work conducted during this part of the year.

A written report with the pre-construction survey results must be provided to the Merced County Community and Economic Development Department and CDFW within 30 days prior to commencement of construction-related activities. The report shall include: the date of the report, authors and affiliations, contact information, introduction, methods, study location, including map, results, discussion, and literature cited.

2. **Nest Avoidance:** If the required protocol surveys show there are no active nests within 0.5 mile of construction activities, then no additional mitigation for nest disturbance will be required. If nesting Swainson's hawks are observed within 0.5-mile of the project site, the project applicant must implement CDFW pre-approved mitigation measures to avoid nest impacts during construction. These measures include:
 - a. All project-related activities with the potential to cause nest abandonment or forced fledging of young shall be avoided until the young have fledged.
 - b. If disturbances, habitat conversions, or other project-related activities, that may cause nest abandonment or forced fledging, are necessary, within the nest protection buffer zone (0.5-mile), monitoring of the nest site by a qualified raptor biologist, funded by the project applicant, shall be required, to determine if the nest is abandoned. If the nest is abandoned, but the nestlings are still alive, the project proponent is required to fund the recovery and hacking, that is the controlled release of captive reared young, of the nestling.
 - c. The project applicant shall be required to coordinate with CDFW to determine if project activities with the potential to cause disturbance to nesting Swainson's hawks within the 0.5-mile buffer may proceed with a reduced nest buffer and an approved biological monitor. CDFW may authorize a reduced nest buffer with the presence of a monitoring biologist during construction activities to ensure that the nest is not disturbed.
 - d. Routine disturbances such as agricultural activities, commuter traffic, and routine maintenance activities within one-quarter-mile of an active nest are not prohibited.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Mitigation Measure BIO-1 relies on the CDFW permit process and mitigation requirements to avoid “take” of special status species. Although the mitigation measure is within the jurisdiction of an agency other than Merced County, the required measures must be completed prior to commencement of any activities that would result in these impacts, and compliance with the CDFW permit requirements would fully mitigate impacts to Swainson’s hawk nesting habitat to reduce this impact to less than significant.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and CDFW shall monitor for compliance. Implementation of Mitigation Measure BIO-1 shall occur prior to issuance of a building permit, and prior to and during construction.

Impact BIO-2: Disruption to nesting activities of sensitive and migratory bird species (Criteria IV.a/d)

The proposed Hillcrest Dairy Expansion project would be constructed within the existing dairy footprint, but within a larger project area that has been cultivated in grain crops, and provides potential nesting habitat for a variety of special-status and migratory bird species protected by the Migratory Bird Treaty Act (MBTA). Because construction activities could disturb nesting birds in the surrounding agricultural fields, this would be a significant impact.

The agricultural fields found on and around the project area may provide suitable breeding habitat for ground nesting and migratory birds. While there would be no direct conversion of agricultural fields since construction would occur within the existing footprint of the dairy, construction noise, vibration, and movement of workers or equipment could affect nests in the project area.

Because construction activities could affect nesting and disrupt breeding activities for sensitive and migratory bird species, this would be a significant impact, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure BIO-2a:

Implement Mitigation Measure BIO-1, if necessary, which includes measures to minimize potential impacts to Swainson’s hawk, and which would benefit other species as well.

Mitigation Measure BIO-2b:

1. A preconstruction survey shall be conducted to determine the presence of nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 1 through September 15). The project site and potential nesting areas within 100 feet of the site for MBTA-protected birds and 500 feet for raptors shall be surveyed no more than 10 days prior to the initiation of construction. Surveys will be performed by a qualified biologist or ornithologist to verify the presence or absence of nesting birds.
2. Construction shall not occur within a 500-foot buffer surrounding nests of raptors (including burrowing owls) or a 100-foot buffer surrounding nests of migratory birds (including killdeer, house finch, mourning dove, etc.).

3. If construction within these buffer areas is required, or if nests must be removed to allow continuation of construction, prior approval must be obtained from the CDFW.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Preconstruction surveys and avoidance measures would reduce this impact to less than significant.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and CDFW shall monitor for compliance. Implementation of BIO-2a shall occur prior to issuance of a building permit, and prior to and during construction. Implementation of BIO-2b shall occur prior to and during construction.

Impact BIO-3: Disruption to nesting habitat for tricolored blackbird (Criteria IV.a/d)

The Hillcrest Dairy Farm provides potential nesting habitat for tricolored blackbird (TCBB), a threatened species under the California Endangered Species Act (CESA). Because cropland in the vicinity of the project site is typically planted with wheat, TCBB could nest adjacent to the project site. Construction activities could disrupt TCBB nesting and breeding activities. This would be a significant impact.

The Tricolored Blackbird is a California threatened species under CESA. Based on a statewide survey, the TCBB population has declined by 63 percent from 2008 to 2014 (Meese 2014). However, the most recent results of the 2017 TCBB Statewide Survey suggest that the rapid decline in abundance observed since at least 2008 has been arrested and that there has been an increase in abundance since 2014 of about 32,000 birds (Meese 2017). TCBB is a highly colonial species that nests in large flocks near open water with a protected substrate and nearby foraging area. Historically, TCBB nested within emergent wetland in the Central Valley; however, currently 38 percent of TCBB nests occur on triticale, a wheat-rye hybrid grown for forage on dairies. The timing of triticale harvest conflicts with TCBB nesting, putting entire colonies at risk from harvesting activities that occur before fledging. TCBB foraging typically occurs within 3-5 miles of the nesting colony. Lightly grazed fields, irrigated pastures, annual grasslands, and grain fields that provide habitat for a supply of large insects such as grasshoppers, dragonflies, and damselflies offer the best foraging habitat. Surface water is typically present within a half mile of a nesting colony, a habitat criterion that would be met by the wastewater storage ponds at the project site. On-site croplands could provide suitable nesting habitat for TCBB.

Construction of the proposed dairy expansion would occur within the footprint of the existing dairy, but in close proximity to cropland that provides habitat for nesting TCBB. Because potential nesting habitat for special-status bird species could be disrupted by construction activities, this would be a significant impact, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure BIO-3a:

Implement Mitigation Measure BIO-1, if necessary, which includes measures to minimize potential impacts to Swainson's hawk, and which would benefit other species as well.

Mitigation Measure BIO-3b:

Implement Mitigation Measure BIO-2b, which includes a preconstruction survey to determine presence / absence of TCBB or MBTA protected nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 1 through September 15).

Mitigation Measure BIO-3c:

If a TCBB nest colony is discovered during preconstruction surveys, implement a minimum 300-foot no-disturbance buffer around the colony in accordance with CDFW's "*Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields in 2015*" (CDFW 2015). This buffer shall remain in place until the breeding season has ended or until a qualified biologist has determined that nesting has ceased, the birds have fledged, and fledglings are no longer reliant upon the colony or parental care for survival. If a TCBB nesting colony is detected during surveys, consultation with CDFW is warranted to discuss how to implement the project and avoid take, or if avoidance is not feasible, to acquire an Incidental Take Permit, pursuant to Fish and Game Code section 2081 subdivision (b), prior to any ground-disturbing activities.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Preconstruction surveys and avoidance measures would reduce this impact to less than significant.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and CDFW shall monitor for compliance. Implementation of BIO-3a shall occur prior to issuance of a building permit, and prior to and during construction. Implementation of BIO-3b and BIO-3c shall occur prior to and during construction.

7 CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

This chapter provides an evaluation of potential effects on cultural resources and tribal cultural resources associated with the proposed Hillcrest Dairy Expansion project. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), construction and operation of the Hillcrest Dairy Expansion project could result in significant impacts to cultural resources, tribal cultural resources, and human remains that may exist in the subsurface portions of the project site during construction. Additional potential historic resource effects have been previously evaluated in the project IS and will not be evaluated further in this chapter. (This less-than-significant impact is briefly summarized in Section 7.3 below.)

The following evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the 2030 Merced County General Plan Environmental Impact Report (EIR) in addition to the EIR for Revisions to the Animal Confinement Ordinance (ACO) and its approval of the ACO.

INTRODUCTION

Cultural resources are the remains and sites associated with human activities, and include prehistoric and ethnohistoric¹ Native American archaeological sites, historic archaeological sites, historical buildings, and elements or areas of the natural landscape that have traditional cultural significance. They consist of both surface and subsurface artifacts, structures, or features. When cultural resources are considered in the context of their natural surroundings or the rock strata (layers) in which they are found, they may contribute valuable information to the archaeological or historic record. Cultural resources are a nonrenewable resource that, if properly managed, can increase the knowledge and understanding of past cultures and events.

Native American cultural resources may also have sacred values that can only be identified through coordination and input from local Native Americans. Under California Public Resources Code (PRC) Section 5097.9 *et seq.*, any public agency is prohibited from interfering with the free expression or exercise of Native American religion or causing severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property. Under PRC Section 5097.94, lead agencies are required to consider the effects of projects on tribal cultural resources, and to conduct consultation with federally and non-federally recognized Native American Tribes who are traditionally and culturally affiliated with the geographic area of the proposed project, and who have requested such consultation in writing.

7.1 REGULATORY FRAMEWORK

FEDERAL REGULATIONS

National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.). The National Historic Preservation Act (NHPA) is a federal law created to avoid unnecessary harm to historic properties. The NHPA includes regulations that apply specifically to federal land-holding agencies, but also includes regulations (Section 106) that pertain to all projects funded, permitted, or approved by any

¹ Ethnohistory is the study of cultures and indigenous peoples' customs by examining historical records as well as other sources of information on their lives and history.

federal agency that have the potential to affect historical and cultural resources. The proposed project is privately funded and would not require any federal permits; since no federal actions are associated with the proposed project, the NHPA in addition to the National Environmental Policy Act of 1969 (NEPA) (16 U.S.C. 4321, and 4331-4335) are not expected to apply to this project.

American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996 and 1996a). The American Indian Religious Freedom Act and the Native American Graves and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.) establish that traditional religious practices and beliefs, sacred sites, and the use of sacred objects shall be protected and preserved.

STATE REGULATIONS

California Environmental Quality Act (Public Resources Code Section 21000 et seq.). The California Environmental Quality Act (CEQA) provides direction on determining the significance of impacts to archaeological and historical resources. PRC Section 21083.2 and Section 15064.5 of the State CEQA Guidelines require that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources that meet significance criteria qualifying them as “unique” or “important,” on the California Register of Historic Resources (CRHR), or determined eligible for listing on the CRHR. Potential eligibility is also based on the integrity of the resource. Integrity is defined as the retention of the resources’ physical condition that existed during its period of significance. It is determined through careful consideration of a resource’s design, workmanship, materials, location, feeling, and association to important events in history.

California Register of Historical Resources. The CRHR is restricted to properties that are to be protected from substantial adverse change (PRC Section 5024.1). The CRHR lists properties that have been formally determined to be eligible for listing in the National Register of Historic Places, State Historical Landmarks, and listed as eligible as Points of Historical Interest. All other resources require nomination in order to be included on the Register.

California Public Resources Code Section 5097. Part of the Native American Historic Resource Protection Act, PRC Section 5097 specifies the archaeological, paleontological, and historical and sacred site procedures that must occur both prior to and during construction of any major public works project on state or public lands. It describes the procedures in the event there is a discovery of human remains.

California Public Resources Code Section 5097.94. Assembly Bill (AB) 52 was approved in September 2014, amending PRC Section 5097.94, and adding to sections of the code relating to Native Americans. AB 52 requires lead agencies to consider the effects of projects on tribal cultural resources, and to conduct consultation with federally and non-federally recognized Native American Tribes early in the environmental planning process. AB 52 states that the lead agency must consult with California Native American Tribes who are traditionally and culturally affiliated with the geographic area of the proposed project, and who have requested such consultation in writing.

California Health and Safety Code Sections 7050.5 - 7055. Division 7 of the Health and Safety Code governing dead bodies states that the disturbance of Native American cemeteries is a felony. It requires that construction or excavation must be stopped in the vicinity of discovery of human remains until the County Coroner can determine whether the remains are those of a Native

American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission.

Executive Order B-64-80. Executive Order B-64-80 directs state agencies to identify, inventory, preserve, and maintain cultural resources under their jurisdiction.

LOCAL POLICIES

Merced County General Plan. The Merced County 2030 General Plan contains the following and policies related to cultural resources:

Policy RCR-2.5: Human Remains Discovery

Require that, in the event of the discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County Coroner and Native American Heritage Commission will be notified.

Policy RCR-2.10: Tribal Consultation

Consult with Native American tribes regarding proposed development projects and land use policy changes consistent with Planning and Zoning Law at Government Code Section 65351, and the OPR Tribal Consultation Guidelines (2005).

These policies, and their relevance to the proposed project, are further discussed in Section 7.3, *Environmental Effects*, below, in addition to Table 11-1 in Chapter 11, *Land Use Compatibility*.

Merced County Animal Confinement Ordinance. The revised ACO does not address the protection of cultural resources. However, Merced County requires that all new animal confinement facilities obtain an Administrative Permit or a Conditional Use Permit. Both of these permits are discretionary and require that the County comply with the requirements of CEQA in an environmental review process. To address potential impacts to cultural resources, the EIR prepared for the revised ACO contains mitigation measures to be implemented during environmental review of animal confinement facility projects such as the Hillcrest Dairy Expansion project. Mitigation measures adopted as policy in the EIR for the ACO include:

- Consultation with listed Native Americans regarding the identification and locations of known and unknown cultural resources and traditional cultural properties;
- Assessment of identified cultural resources by a qualified archaeologist;
- Evaluation of the resource according to CEQA significance criteria and preparation of a mitigation plan in accordance with appropriate guidelines and consultation with listed Native Americans;
- Suspension of work if archaeological resources are encountered at any site of an animal confinement facility during construction until the County complies with above listed measures.

These policies, in addition to Merced County's Standard Conditions for Private Projects (see Chapter 4, *Introduction to the Environmental Analysis*), were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below.

7.2 ENVIRONMENTAL SETTING

7.2.1 METHODOLOGY

Records of the known cultural resources found in Merced County are included in the files of the Office of Historic Preservation, California Historical Resources Information System. The Central California Information Center (CCIC), housed at California State University, Stanislaus, locally administers these records. A records search request was filed with the CCIC on August 23, 2021 for the project site and surrounding area to determine its historic and cultural sensitivity (CCIC 2021).

NATIVE AMERICAN CONSULTATION

In order to assess the cultural resources potential of certain project areas it is necessary to consult with Native Americans by contacting the Native American Indian community. The Native American Heritage Commission (NAHC), in Sacramento, was contacted on August 24, 2021 to request an examination of their Sacred Lands Files to determine whether the project is located on sacred land, and to request a current list of Native American tribal representatives who may have concerns regarding the proposed project.

Results of the records search by the NAHC were negative (NAHC 2021). AB 52 requires that the lead agency must consult with California Native American Tribes who are traditionally and culturally affiliated with the geographic area of the proposed project, and who have requested such consultation in writing. At the time of preparation of this EIR, no tribes had requested such consultation, nor had any tribes requested to be informed of projects in the area of the proposed project.

7.2.2 PROJECT SETTING

The existing Hillcrest Dairy is located on approximately 200 acres of a farm totaling 2,290 acres in an unincorporated area of Merced County, west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area. The proposed construction area has been leveled to agricultural grade; modification of the proposed facilities would occur within the existing footprint of the dairy, and there would be no change in cropped acreage associated with the farm.

The project region is dominated by agriculture, and includes a system of canals and laterals. Bear Creek is located approximately one mile north of the proposed project area, and Miles Creek is located approximately one mile south of dairy facilities and east of Planada.

The CCIC Records Search report showed that there have been no previous cultural resources investigations on or in the vicinity of the proposed project. No prehistoric or historic resources on the project site or in its vicinity have been reported to the CCIC, and there are no resources that are known to have value to local cultural groups. (CCIC 2021). Because the proposed construction would occur in the existing dairy footprint and there would be limited ground disturbance, and no historic or cultural resources were identified in the CCIC records search, a cultural resources assessment was not prepared for this project.

7.3 ENVIRONMENTAL EFFECTS

7.3.1 SIGNIFICANCE CRITERIA

The project was evaluated in terms of findings of significance defined in State CEQA Guidelines Section 15065, and Appendix G of the State CEQA Guidelines Section V, *Cultural Resources*, and Section XVIII, *Tribal Cultural Resources*. A project would normally result in a significant impact if the proposed project would:

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. (*V.b*)
- Disturb any human remains, including those interred outside of formal cemeteries. (*V.c*)

An additional cultural resource assessment criterion previously evaluated in the project IS/NOP was whether the project would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5. (*V.a*)

This impact was found to be less than significant and will not be evaluated further in this chapter.

For Tribal Cultural Resources, a project would normally result in a significant impact if the proposed project would cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC 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 America tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 2010.1(k), or (*XVIII.a*)
- 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. (*XVIII.b*)

Pursuant to Section 15064.5 of the CEQA Guidelines, a historical resource is presumed significant if it is listed on the CRHR, or has been determined to be eligible for listing by the State Historical Resources Commission. A historical resource may also be considered significant if the lead agency determines, based on substantial evidence, that the resource meets the criteria for inclusion in the CRHR.

Section 15064.5(b) of the CEQA Guidelines further provides standards for determining what constitutes a “substantial adverse change” that must be considered a significant impact on a historic resource. A “substantial adverse change” means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.” Material impairment means demolishing or altering “in an adverse manner those characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources.”

The section further states that archaeological resources not otherwise determined to be historical resources may be significant if they are unique. Pursuant to PRC Section 21083.2, a unique archaeological resource is defined as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets one of the following criteria:

- Contains information needed to answer important scientific questions and there is a demonstrable public interest in that information;
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

According to Section 15064.5 of the CEQA Guidelines, all human remains are significant.

A non-unique archaeological resource means an archaeological artifact, object, or site that does not meet the above criteria. A non-unique archaeological resource need be given no further consideration under CEQA.

7.3.2 ENVIRONMENTAL IMPACTS

Impact CUL-1: Cause a substantial adverse change in the significance of an archaeological resource (Criterion V.b)

Construction of the proposed dairy facilities could result in substantial adverse changes to the significance of unknown archaeological resources within the project area. Because ground-disturbing activities could affect unidentified remains of subsurface archaeological resources, this would be a significant impact.

The CCIC records search reported that no previously recorded prehistoric sites, historic archaeological resources, or historic buildings are located within the proposed project area, or within the immediate vicinity of the project area. No previous investigations completed within the project area have been reported to the CCIC. Archaeological resources are suspected to be minimal because the project site is not directly adjacent to any creek or waterway, and the dominant land use has been for agricultural uses (including leveling, cultivation, grading, and construction of the existing dairy). Thus, any archeological artifacts that might have been present may have been destroyed or moved off-site during the development of the site.

An assessment of cultural resources in the project area known to be protected or sacred by the Native American Indian community was completed through consultation with the NAHC, Sacramento. The NAHC was contacted to request an examination of their Sacred Lands Files to determine whether the project is located on sacred land. The assessment completed by the NAHC determined that no sacred lands were identified in the area of the proposed project. As of the time of preparation of the EIR (April 2022), no correspondence was received from Native American tribal representatives requesting information or consultation on the proposed project.

The proposed project includes the construction of new supporting buildings and structures within the existing footprint of the dairy. All construction would take place on land that has been

previously disturbed. However, significant cultural remains can exist below the plow zone in Merced County, and these resources may be unearthed during construction or continued cropping activities at the project site.

All aspects of the assessment of potential cultural resources at the project site indicate that no known cultural or archaeological resources are present within the project area. However, previously unidentified archaeological paleontological resources may remain buried below the plow zone, which could be disturbed by project construction activities. This impact would be significant.

Significance of Impact: Significant.

Mitigation Measure CUL-1:

The project applicant and construction contractor shall implement measures to address discovery of unanticipated buried cultural resources. If buried cultural resources such as chipped or ground stone, midden deposits, historic debris, building foundations, or paleontological resources are inadvertently discovered during ground-disturbing activities, work shall stop in that area and within 100 feet of the find until a qualified archaeologist or paleontologist can assess the significance of the find and, if necessary, develop responsible treatment measures in consultation with Merced County and other appropriate agencies. Measures must result in the avoidance, preservation, or recordation of the resource.

Environmental Effects of Measure: If any cultural resources are discovered during construction of the Hillcrest Dairy Expansion project, implementation of Mitigation Measure CUL-1 would protect these resources, and would trigger additional mitigation for effects to such resources. All physical improvements or activities that could result in changes to the physical environment required by these measures would be located within the project site, and no additional impacts beyond those identified for such development in Chapters 5 through 11 of this Draft EIR would occur.

Significance after Mitigation: Implementation of Mitigation Measure CUL-1 would provide protection of archaeological, historic, and paleontological resources, and would ensure that these features are protected, preserved, and/or documented by requiring the project applicant and construction contractor to implement measures that address the discovery of unanticipated buried cultural or paleontological resources. Therefore, this impact would be less than significant after implementation of Mitigation Measure CUL-1.

Implementation/Monitoring: Implementation of this mitigation measure would be the responsibility of the project applicant/construction contractor and Merced County Community and Economic Development Department, and that department shall monitor for compliance. Implementation of Mitigation Measure CUL-1 would occur prior to and during project construction.

Impact CUL-2: **Result in the accidental discovery and disturbance of human remains (Criterion V.c)**

Construction activities associated with the Hillcrest Dairy Expansion project could result in the accidental discovery of human remains. This would be a significant impact.

No human remains have previously been identified within the project area. Even though no remains have been discovered during previous disturbance of the project site, currently unknown remains could be disrupted by construction operations that involve the excavation or disturbance of subsurface layers. As a result, the potential for the accidental discovery and disturbance of human remains would result in a significant impact. Through Resolution 20-001, Merced County has imposed conditions relating to undiscovered cultural resources pursuant to Section 5097.98 of the State Public Resources Code, and Section 7050.5 of the State Health and Safety Code. The following regulatory requirements will be included as conditions of approval for the proposed project:

Significance of Impact: Significant.

Mitigation Measure CUL-2a:

Implement Mitigation Measure CUL-1.

Mitigation Measure CUL-2b:

The project applicant and construction contractor shall implement a plan to address discovery of human remains. If remains of Native American origin are discovered during proposed project construction, it shall be necessary to comply with state laws concerning the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (NAHC). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- The County coroner has been informed and has determined that no investigation of the cause of death is required; and
- If the remains are of Native American origin:
 - ✓ The most likely descendants of the deceased Native Americans (identified by the NAHC) has made a recommendation to the landowner or person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or
 - ✓ The NAHC has been unable to identify a descendant, or the descendant failed to make a recommendation within 24 hours after being notified.

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

Environmental Effects of Measure: If any human remains are discovered during construction of the proposed Hillcrest Dairy Expansion project, implementation of Mitigation Measure CUL-2

would protect these remains, and would trigger additional mitigation for effects to such resources. All physical improvements or activities that could result in changes to the physical environment required by these measures would be located within the project site, and no additional impacts beyond those identified for such development in Chapters 5 through 11 of this Draft EIR would occur.

Significance after Mitigation: Implementation of Mitigation Measure CUL-2 would provide protection of human remains, and would ensure that any remains are protected, handled according to state law, and treated with appropriate respect. Therefore, this impact would be less than significant after implementation of Mitigation Measure CUL-2.

Implementation/Monitoring: Implementation of this mitigation measure would be the responsibility of the project applicant/construction contractor and Merced County Community and Economic Development Department, and that department shall monitor for compliance. Implementation of CUL-2 would occur prior to and during project construction.

Impact CUL-3: Cause a substantial adverse change in the significance of a tribal cultural resource (Criteria XVIII.a/b)

Ground-disturbing construction activities associated with the Hillcrest Dairy Expansion project would not result in a substantial adverse change in the significance of a tribal cultural resource since no tribal cultural resources were identified on the project site, and no Native American tribes requested notification or consultation. This would be a less-than-significant impact.

The Native American Heritage Commission was contacted to conduct a record search of the Sacred Lands File. The records search produced negative results. As of preparation of the EIR (April 2022), no Native American tribes have requested in writing that Merced County notify and consult with them early in the environmental planning process in accordance with AB 52 (Guerrero, pers. comm. 2022).

Because the Sacred Lands File produced negative results, and no requests have been received by the County from Native American representatives to consult on projects proposed for their geographic area, the County's obligations under AB 52 and the implementing requirements of the Public Resources Code have been satisfied. As a result, this potential impact would be less than significant.

Significance of Impact: Less than significant.

Mitigation Measure CUL-3: None required.

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8 GREENHOUSE GAS EMISSIONS AND ENERGY USE

This chapter provides an evaluation of greenhouse gas (GHG) emissions generated by the proposed Hillcrest Dairy Expansion project, in addition to an evaluation of potential energy impacts from the dairy expansion. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), the construction and operation of the Hillcrest Dairy Expansion project would result in greenhouse gas emissions from direct and indirect sources.

Global climate change refers to the long-term fluctuations in temperature, wind patterns, precipitation, and other aspects of the climate systems of the earth. It is widely recognized that GHG emissions associated with human activities are contributing to global climate change, which is a public health and environmental concern widely recognized around the world. As global concentrations of atmospheric greenhouse gases increase, global temperatures increase, as do weather extremes and air pollution concentrations. GHG emissions are produced from: electricity generation, road transportation, and other energy sources; industrial processes; agriculture, forestry, and other land use; solid waste disposal; and wastewater treatment and discharge. Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are the principal GHGs.

8.1 REGULATORY FRAMEWORK

This section includes a discussion of laws, ordinances, regulations, and standards applicable to greenhouse gas emissions and energy efficiency.

8.1.1 FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

The United States Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA). The U.S. Supreme Court ruled on April 2, 2007 that carbon dioxide is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs¹. However, there are no federal regulations or policies regarding GHG emissions thresholds applicable to the proposed project at the time of preparation of this Environmental Impact Report (EIR).

Greenhouse Gas Reporting Program. Under the Final Mandatory Reporting of Greenhouse Gas Rule, suppliers of fossil fuels or industrial GHGs including carbon dioxide, methane, nitrous oxide, and fluorinated gases; manufacturers of vehicles or engines; and facilities that emit more than 25,000 metric tons or more per year of GHGs are required to submit annual reports to EPA. This comprehensive, nationwide emissions data will provide a better understanding of the sources of GHGs, and will guide development of the policies and programs to reduce emissions. Large agricultural operations with manure management systems may be affected by the EPA rule. The minimum average annual animal population for dairies to emit 25,000 tons per year (t/yr) or more of GHG is 3,200 dairy cows. Operators of facilities with less than 3,200 dairy cows will likely not need to report under this rule. Congressional action, however, has blocked the rule's application to livestock

¹ On June 30, 2022, the U.S. Supreme Court case ruling on *West Virginia v. Environmental Protection Agency* restricts the EPA's power to regulate GHGs. The court found that the EPA does not have broad authority under the Clean Air Act to devise GHG emissions caps.

manure management. The EPA will not be implementing subpart JJ, Manure Management of Part 98 due to a Congressional restriction prohibiting the expenditure of funds for this purpose (EPA 2022).

Climate Adaptation Plan. The Climate Adaptation Action Plan was developed by the EPA to address reduction of greenhouse gases in the United States. The plan consists of more than 50 voluntary programs, including the Ruminant Livestock Efficiency Program (RLEP) and the AgStar Program. The RLEP, developed in coordination with the United States Department of Agriculture (USDA), provides a series of improved livestock production practices that could readily be implemented to reduce methane emissions from ruminant animals. Developed in conjunction with the USDA, this program established livestock production practices (modification of feed), which if implemented, could reduce methane emissions. The AgStar Program, developed by the EPA, USDA, and U.S. Department of Energy, encourages the use of methane recovery technologies to reduce methane emissions at concentrated animal feeding operations that manage manure as liquids or slurries.

Kyoto Protocol. The Kyoto Protocol is an international treaty that extends the 1992 United Nations' Framework Convention on Climate Change (UNFCCC) that commits parties to reduce greenhouse emissions. The major feature of the Kyoto Protocol first commitment period, which came into force in 2005, is that it sets binding targets for 36 industrialized countries for reducing GHG emissions. These amount to an average reduction of five percent against 1990 levels over the five-year period of 2008-2012. In December 2012, the Doha Amendment to the Kyoto Protocol was adopted, which includes new commitments for the period from 2013-2020. During the second commitment period, parties committed to reduce GHG emissions by at least 18 percent below 1990 levels in the eight-year period of 2013 to 2020; however, the parties are different from those who participated in the first round of commitments. The United States signed but did not ratify the Protocol, and Canada withdrew from it in 2012. While not a part of the Kyoto Protocol but within the framework of the UNFCCC, the Paris Agreement was adopted in December 2015 with the aim of governing greenhouse gas emissions after 2020, where all major emitting countries committed to cut climate pollution and strengthen those commitments over time. As of March 2021, 191 UNFCCC members are parties to the agreement. While the United States withdrew from the agreement on November 4, 2020 under then-President Donald Trump, the United States officially rejoined the Paris Agreement on February 19, 2021 following President Biden's day one executive order.

8.1.2 STATE PLANS, POLICIES, REGULATIONS, AND LAWS

The California Air Resources Board (ARB) is the agency responsible for the coordination and oversight of state and local air pollution control programs in California, and for implementing the California Clean Air Act (CCAA). Various statewide and local initiatives to reduce the state's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way, and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can help to slow or stop the human-caused increase in average global temperatures, and the associated changes in climatic conditions.

California's Mandatory Greenhouse Gas Reporting Rule

The California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (California Mandatory Reporting Rule) (17 CCR, Section 95100-95157), approved in 2007, is similar to the U.S. EPA Mandatory Reporting Rule in that it requires certain large emitters and suppliers to report their GHG data on an annual basis; however, the California emissions threshold is lower at only 10,000 metric tons of CO₂e per year. The California Mandatory Reporting Rule excludes GHG emissions related to livestock manure management systems and agricultural irrigation pumps.

Executive Order N-79-20

Executive Order N-79-20 directs the state to require that, by 2035, all new cars and passenger trucks sold in California be zero-emission vehicles – a target which would achieve more than a 35 percent reduction in greenhouse gas emissions and an 80 percent improvement in oxides of nitrogen emissions from cars statewide. The transportation sector accounts for more than half of California's carbon dioxide levels, 80 percent of smog-forming pollution, and 95 percent of toxic diesel emissions. The executive order will not prevent Californians from owning gasoline-powered cars or selling them on the used car market. In response to the Executive Order, the ARB is currently developing the Advanced Clean Cars II program, which will update the State's passenger vehicle emission standards and zero-emission vehicle (ZEV) requirements. The ACC II regulations propose to scale down emissions from light-duty passenger cars, pickup trucks, and sport utility vehicles (SUVs), starting with the 2026 model year. The Advanced Clean Cars program combines the control of smog-causing (criteria) pollutants and GHG emissions into a single coordinated package of regulations.

Executive Order S-3-05

Executive Order S-3-05 (2005) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent of the 1990 level by 2050. The 2010 and 2020 goals were enshrined into law by the legislation known as Assembly Bill 32, described below.

Assembly Bill 32, the California Climate Solutions Act of 2006

In September 2006, then-Governor Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. In 2011, the ARB adopted the cap-and-trade regulation. The cap-and-trade program covers major sources of GHG emissions in the State such as refineries, power plants, industrial facilities, and transportation fuels. The cap-and-trade program includes an enforceable emissions cap that will decline over time. The State will distribute allowances, which are tradable permits, equal to the emissions allowed under the cap.

The initial main strategies and roadmap for meeting the 1990 emission level reductions are outlined in a Scoping Plan approved in December 2008 and updated every five years (the Scoping Plan was most recently updated in 2014 and finalized in 2017). The Scoping Plan includes regulations and alternative compliance mechanisms, such as monetary and non-monetary incentives, voluntary actions, and market-based mechanisms, such as a cap-and-trade program. The Climate Change Scoping Plan also includes a breakdown of the amount of GHG reductions the ARB recommends for each emissions sector of the state's GHG inventory. In November 2017, ARB issued the Final 2017 Climate Change Scoping Plan Update to reflect the 2030 target set by Executive Order B-30-15. The 2017 Scoping Plan identifies SB 1383 and the resultant Short-Lived Climate Pollutant Reduction Strategy as a means to achieve significant emissions reductions from agricultural sources (see below). (ARB 2017a) The 2022 Scoping Plan Update (currently under development as of April 2022) will assess progress towards achieving the Senate Bill 32 2030 target and lay out a path to achieve carbon neutrality no later than 2045.

Cap-and-trade is a market based regulation that is designed to reduce greenhouse gases (GHGs) from multiple sources. Cap-and-trade sets a firm limit or cap on GHGs and minimize the compliance costs of achieving AB 32 goals. The cap will decline approximately 3 percent each year beginning in 2013. Trading creates incentives to reduce GHGs below allowable levels through investments in clean technologies. With a carbon market, a price on carbon is established for GHGs. Market forces spur technological innovation and investments in clean energy. Cap-and-trade is an environmentally effective and economically efficient response to climate change. (ARB 2017a)

The AB 32 Scoping Plan recognizes that some sectors (e.g. agriculture) are currently not suitable for inclusion in the cap-and-trade program and, as a result, instead recommends separate complementary voluntary strategies for those sectors. The Compliance Offset Protocol for Livestock Projects is one of four protocols for voluntary activities that have been approved by the ARB under the Cap and Trade Program. This protocol provides the procedures necessary for quantifying and reporting GHG emission reductions associated with the installation of a biogas control system, such as a digester, for manure management on dairy cattle and swine farms. These quantified emission reductions can be sold in the market as emission offset credits. See Alternatives 2 and 3 in Chapter 13, *Alternatives Analysis*, of this EIR, for discussion of the feasibility of installing dairy digesters.

Executive Order B-30-15

Executive Order B-30-15 (April 2015) identified an intermediate California greenhouse gas reduction target of 40 percent below 1990 levels by 2030. California exceeded the initial target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32). The state reached that goal by 2016. The 2030 target acts as an interim goal on the way to achieving reductions of 80 percent below 1990 levels by 2050, a goal set by former Governor Schwarzenegger in 2005 with Executive Order S-3-05. This intermediate target was codified into law by SB 32.

Senate Bill 32, the California Climate Solutions Act of 2006: Emissions Limit

As the sequel to AB 32, Senate Bill (SB) 32 (September 2016) requires the state board to ensure that statewide greenhouse gas emissions are reduced to 40 percent below the 1990 level by 2030, a goal set forth in Executive Order B-30-15. The 2030 target acts as an interim goal on the way to achieving reductions of 80 percent below 1990 levels by 2050, a goal set in 2005 with Executive Order S-3-05. As set forth in the Scoping Plan, no state regulatory requirements are to go into effect prior to 2024 requiring dairy sector methane reductions to meet AB 32's 2020 reduction goals or SB

32's 2030 goals for reducing GHG emissions. The reduction of methane emissions from dairy operations will continue to be voluntary at least through 2023.

Senate Bill 605

Senate Bill 605 (Lara, Chapter 523, Statutes of 2014) requires ARB, in coordination with other State agencies and local air districts, to develop a strategy to further reduce short-lived climate pollutant emissions in California. Short-lived climate pollutants are powerful climate forcers that remain in the atmosphere for a much shorter period of time than major climate pollutants such as carbon dioxide. Their relative potency in terms of how they heat the atmosphere can be tens to thousands of times greater than CO₂. Short-lived climate pollutants include methane, black carbon, and fluorinated gases. Reducing these emissions can have an immediate beneficial impact on climate change. The Short-Lived Climate Pollutant Reduction Strategy, described below, was established pursuant to SB 605.

The ARB issued the Short-Lived Climate Pollutant Reduction Strategy (SLCP Strategy) in March 2017, which lays out a range of options to accelerate SLCP emission reductions in California, including regulations, incentives, and other market-supporting activities. Additional legislation (AB 1613 and SB 859) included a spending plan for Cap-and-Trade revenues that specifically target SLCP emission reductions. These included \$5 million for black carbon wood smoke reductions, \$40 million for waste reduction and management, \$7.5 million for Healthy Soils, and \$50 million for methane emission reductions from dairy and livestock operations. (ARB 2017)

As stated in the Strategy, California can cut methane emissions by 40 percent below current levels in 2030 by capturing or altogether avoiding methane from manure at dairies, meeting national industry targets for reducing methane emissions from enteric fermentation, effectively eliminating disposal of organics in landfills, and reducing fugitive methane emissions by 40-45 percent from all sources. California will aim to reduce methane emissions from dairy manure management by at least 20 percent in 2020, 50 percent in 2025, and 75 percent in 2030. To accomplish this, the State will encourage and support near-term actions by dairies to reduce emissions through market support and financial incentives. At the same time, ARB will initiate a rulemaking process to develop regulations for dairy manure management in California (ARB 2017).

Senate Bill 1383

Under SB 1383 (Lara, Chapter 395, Statutes of 2016), the ARB is required to establish a comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The bill also would establish specified targets for reducing organic waste in landfills.

SB 1383 requires the formation of a dairy and livestock sector Working Group to identify and address technical, market, regulatory, and other barriers to the development of dairy methane reduction projects. The Working Group, made up of California Department of Food and Agriculture (CDFA), partner agencies and a diverse group of stakeholders and experts, produced recommendations to advance methane reductions on California dairies and livestock operations while also supporting the resiliency and sustainability of California's world-renown dairy and livestock industry.

In recognition of the need for public funding sources to subsidize voluntary dairy methane emissions reduction projects, funds from the Cap-and-Trade Program are allocated to the Greenhouse Gas Reduction Fund to be administered by CDFA to support such projects. CDFA receives funding from California Climate Investments to support projects that reduce methane emissions from dairy and livestock operations, such as dairy digesters and manure management systems, totaling \$29 million for FY 2019-2020, primarily through the Dairy Digester Research and Development Program (DDRDP) and the Alternative Manure Management Program (AMMP). Alternative projects could include installation of mechanical manure solids separation on dairies with flush systems, or conversion to dry manure management practices, such as scrape or vacuum systems, combined with composting or solar drying of manure. Current DDRDP projects are expected to reduce greenhouse gas emissions by an estimated 21.12 million metric tons of CO₂e over ten years. The 114 AMMP projects awarded so far are expected to reduce greenhouse gas emissions by an estimated 2.21 million metric tons of CO₂e over 10 years. Combined, the DDRDP and AMMP funded projects would contribute 57 percent of the 40 percent reduction of methane by 2030 goal. (CDFA 2022)

Advanced Clean Trucks Regulation. The Advanced Clean Trucks regulation was approved on June 25, 2020 and has two main components, a manufacturers ZEV sales requirement and a one-time reporting requirement for large entities and fleets. The purpose of this regulation is to accelerate the market for on-road zero-emission vehicles and to reduce emissions of oxides of nitrogen (NO_x), fine particulate matter (PM), other criteria pollutants, toxic air contaminants, and GHG from medium-and heavy-duty on-road vehicles. Any manufacturer that certifies on-road vehicles over 8,500 lbs. gross vehicle weight rating for sale in California is subject to this rule. Essentially, manufacturers who certify these vehicles would be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035.

California Renewables Portfolio Standard (RPS). The California Renewables Portfolio Standard was established in 2002 under Senate Bill 1078. The California RPS program requires all utilities in the state to source half of their electricity sales from clean, renewable sources such as wind, solar, geothermal, and biopower, by 2030. In 2018, SB 100 (de León, 2018) was signed into law, which increases the RPS to 60 percent by 2030 and requires all the state's electricity to come from carbon-free resources by 2045. Dairy digesters producing electricity are an RPS eligible technology. In addition, dairy digesters can produce biogas and send it to a natural gas-fired energy generation facility, which can produce RPS eligible electricity.

Title 24. Title 24 of the California Code of Regulations, The Energy Efficiency Standards for Residential and Nonresidential Buildings, contains the energy efficiency standards related to residential and nonresidential buildings. These standards conserve electricity and natural gas and prevent the state from having to build more power plants. The *California Green Building Standards Code* (CALGreen Code)(California Code of Regulations, Title 24, Part 11) is a part of the California Building Standards Code that comprehensively regulates the planning, design, operation, and construction of newly constructed buildings throughout the state. Both mandatory and voluntary measures are included in the CALGreen Code. Mandatory measures for non-residential structures include standards for light pollution reduction, energy efficiency, and water conservation, among others.

Long Term Energy Efficiency Strategic Plan. California's first Long Term Energy Efficiency Strategic Plan presents a single roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive Plan for 2009 to 2020, and beyond, is the state's first

integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holding energy efficiency to its role as the highest priority resource in meeting California's energy needs. The Plan includes goals for the agricultural sector to achieve broader energy efficiency, with an emphasis on reducing the largest energy end users – irrigation pumping, process heat applications, and refrigeration. The highest priority identified is to conduct baseline studies to understand the energy usage patterns in California's agricultural sector, forecast likely changes in the future, determine the energy efficiency potential in the seven sub-energy sectors, and evaluate the cost-effectiveness of measures and programs, best practices, etc. This information will help design a cohesive strategy to pursue all cost-effective energy efficiency in California.

8.1.3 MERCED COUNTY

Merced County Greenhouse Gas Reduction Plans. Merced County does not yet have a Climate Action Plan (CAP) or energy plan. The County is in the process of preparing a Climate Action Plan. While completion of the CAP was previously anticipated some time in 2021, the process has been delayed with no projected completion date.

Merced County Animal Confinement Ordinance. No provisions of the ACO directly address methane emissions, but Chapter 18.64.050 U of the Merced County Code (see Appendix C) requires compliance with requirements of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the reduction of air emissions in general. Because the decomposition of manure is one source of methane emissions, measures to comply with reactive organic gas (ROG/VOC) limitations required by Chapter 18.64.050 OO would also reduce methane emissions.

Merced County General Plan. There are several policies in the General Plan that also seek to reduce GHG emissions, including promoting carbon efficient agricultural practices, and encouraging methane digesters for agricultural operations, among others. The policies that are relevant to the proposed project include:

Policy NR-2.9: Energy Conservation

Encourage and maximize energy conservation and identification of alternative energy sources (e.g., wind or solar).

Policy AQ-1.3: Agricultural Operations Emission Reduction Strategies

Promote greenhouse gas emission reductions by encouraging agricultural operators to use carbon efficient farming methods (e.g., no-till farming, crop rotation, cover cropping); install renewable energy technologies; protect grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to other uses; and develop energy-efficient structures.

Policy AQ-2.2: Development Review Process

Use the development review process to achieve measurable reductions in criteria pollutants, toxic air contaminants, and greenhouse gas emissions.

These goals and policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these goals and policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*, of this EIR.

8.2 ENVIRONMENTAL SETTING

8.2.1 GREENHOUSE GASES AND CLIMATE CHANGE

Global Warming is a public health and environmental concern around the world. As global concentrations of atmospheric greenhouse gases increase, global temperatures increase, weather extremes increase, and increases in air pollutant concentrations. Global warming and climate change have been observed to contribute to poor air quality, rising sea levels, melting glaciers, stronger storms, more intense and longer droughts, more frequent heat waves, increases in the number of wildfires and their intensity, and other threats to human health and safety (IPCC 2013). The years 2013–2021 all rank among the ten warmest years in the 1880–2021 record (142-year record). The global annual temperature has increased at an average rate of 0.08°C (0.14°F) per decade since 1880 and over twice that rate (+0.18°C / +0.32°F) since 1981 (NOAA 2022). Hotter days facilitate the formation of ozone, increases in smog emissions, and increases in public health impacts (e.g., premature deaths, hospital admissions, asthma attacks, and respiratory conditions) (EPA 2017a). Because oceans tend to warm and cool more slowly than land areas, continents have warmed the most. If greenhouse gas emissions continue to increase, climate models predict that the average temperature at the Earth’s surface is likely to increase by over 1.5°C by the year 2100 relative to the period from 1850 to 1900 (IPCC 2013).

THE GREENHOUSE EFFECT (NATURAL AND ANTHROPOGENIC)

The Earth naturally absorbs and reflects incoming solar radiation and emits longer wavelength terrestrial (thermal) radiation back into space. On average, the absorbed solar radiation is balanced by the outgoing terrestrial radiation emitted to space. A portion of this terrestrial radiation, though, is itself absorbed by gases in the atmosphere. The energy from this absorbed terrestrial radiation warms the Earth’s surface and atmosphere, creating what is known as the “natural greenhouse effect.” Without the natural heat-trapping properties of these atmospheric gases, the average surface temperature of the Earth would be below the freezing point of water (IPCC 2007). Although the Earth’s atmosphere consists mainly of oxygen and nitrogen, neither plays a significant role in this greenhouse effect because both are essentially transparent to terrestrial radiation. The greenhouse effect is primarily a function of the concentration of water vapor, carbon dioxide, methane, nitrous oxide, ozone, and other trace gases in the atmosphere that absorb the terrestrial radiation leaving the surface of the Earth (IPCC 2007). Changes in the atmospheric concentrations of these greenhouse gases can alter the balance of energy transfers between the atmosphere, space, land, and the oceans. Radiative forcing is a simple measure for both quantifying and ranking the many different influences on climate change; it provides a limited measure of climate change as it does not attempt to represent the overall climate response (IPCC 2007). Holding everything else constant, increases in greenhouse gas concentrations in the atmosphere will likely contribute to an increase in global average temperature and related climate changes (EPA 2017a).

SCIENTIFIC CONSENSUS REGARDING CLIMATE CHANGE

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined with other countries around the world in signing the United Nations’ Framework Convention on Climate Change (UNFCCC) agreement; the goal of the agreement was to control greenhouse gas emissions, including methane.

The UNFCCC definition of climate change is “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” Given that definition, in its assessment of the science of climate change, the IPCC stated that:

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased (IPCC 2013).

The IPCC went on to report in its scientific assessment that:

Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system (IPCC 2013).

The 2014 IPCC report states that numerous long-term changes in climate have been observed at continental, regional, and ocean basin scales, including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns, and aspects of extreme weather including droughts, heavy precipitation, heat waves, and the intensity of tropical cyclones. Continued greenhouse gas emissions at or above current rates would cause further warming and induce many changes in the global climate system. Further, most aspects of climate change will persist for many centuries even if carbon dioxide emissions are stopped (IPCC 2013; IPCC 2022).

GREENHOUSE GASES, THEIR MAJOR SOURCES, AND ATMOSPHERIC CONCENTRATIONS

Naturally occurring greenhouse gases include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, emitted solely by human activities. There are also several gases that, although they do not have a direct radiative forcing effect, do influence the formation and destruction of ozone, which does have such a terrestrial radiation absorbing effect. These gases, referred to here as ozone precursors, include carbon monoxide (CO), oxides of nitrogen (NO_x), and non-methane volatile organic compounds (NMVOC). Aerosols (extremely small particles or liquid droplets emitted directly or produced as a result of atmospheric reactions) can also affect the absorptive characteristics of the atmosphere.

Carbon is stored in nature within the atmosphere, soil organic matter, oceans, marine sediments and sedimentary rocks, terrestrial plants, and fossil fuel deposits. Carbon is constantly changing form on the planet through a number of processes referred to as the carbon cycle, which includes but is not limited to degradation and burning, photosynthesis and respiration, decay, and dissolution². When the carbon cycle transfers more carbon to the atmosphere this can lead to global warming. Over the last 300 years atmospheric levels of carbon have increased by more than 30 percent, of which approximately 65 percent is attributable to fossil fuel combustions and 35 percent is attributed to deforestation and the conversion of natural ecosystems to agricultural use (Pidwirny 2006). Carbon stored in plants and rocks is referred to as being sequestered. Within the United States, forest

² Dissolution is the process whereby carbon dioxide from the atmosphere dissolves in water.

sequestration of carbon offset approximately 13 percent of the fossil fuel GHG emissions in 2011, and from 10 to 20 percent of U.S. emissions each year (USDA 2012).

In 2019 in the United States, energy and transportation related activities accounted for the majority of human-generated greenhouse gas emissions, mostly in the form of carbon dioxide emissions from burning fossil fuels. The major sources of GHG emissions in the U.S. include electricity production (25 percent), transportation (29 percent), industrial processes (such as the production of cement, steel, and aluminum) (23 percent), commercial and residential (13 percent), and agriculture (10 percent). From 2005 to 2019, net emissions declined 13 percent, reflecting the combined impacts of long-term trends in many factors including population, economic growth, energy markets, technological changes including energy efficiency, and energy fuel choices. The decline in recent years is due to an increasing shift to use of less CO₂-intensive natural gas for generating electricity and a rapid increase in the use of renewable energy in the electric power sector. Between 2018 and 2019, greenhouse gas emissions decreased by almost 2 percent due to multiple factors, including a one percent decrease in total energy use (EPA 2021a³).

In the U.S, agriculture contributed approximately 10 percent of total greenhouse gas emissions in 2019, and emissions from livestock (including emissions from enteric fermentation and manure management) made up approximately 36.6 percent of that total (EPA 2021a). The largest contributor to GHG emissions from agricultural activities is agricultural soil management (approximately 55 percent of total GHG emissions from agriculture). Emissions from grazing lands are also significant (Archibeque, et. al, 2012). From 1990 to 2019, emissions from enteric fermentation have increased by 8.4 percent. While emissions generally follow trends in cattle populations, over the long term there are exceptions as population decreases have been coupled with production increases or minor decreases. The data indicates that while emission factors per head are increasing, emission factors per unit of product are decreasing, mostly related to the increased digestibility of feed. Emissions from dairy cattle in 2019 accounted for 24 percent of methane emissions from enteric fermentation (EPA 2021a).

Specific to the U.S. dairy industry, it is estimated that U.S. dairy GHG emissions from fertilizer production through consumption and disposal of milk packaging were approximately 2 percent of total U.S. emissions based on 2007 to 2008 data (Thoma G. et. al. 2012). Of that 2 percent of total GHG emissions allocated to the U.S. dairy industry, 25 percent was from enteric fermentation, 24 percent was from manure management, 19 percent was from feed rations, 17 percent was from transport, processing, and distribution, 4 percent was from farm energy, 6 percent from retail, and 5 percent from consumption and disposal (Thoma G. et. al. 2012).

A brief description of each greenhouse gas, its sources, and its role in the atmosphere is given below. This chapter focuses on the major greenhouse gases emitted by confined animals or agricultural activities, including carbon dioxide, methane, and nitrous oxide.

Carbon Dioxide (CO₂). In nature, carbon is cycled between various atmospheric, oceanic, land biotic, marine biotic, and mineral reservoirs. The largest fluxes occur between the atmosphere and terrestrial biota, and between the atmosphere and surface water of the oceans. In the atmosphere, carbon predominantly exists in its oxidized form as carbon dioxide (CO₂). Atmospheric carbon

³ As of April 2022, the 1990 to 2019 greenhouse gas emissions inventory is the most recent approved source of data available for the United States. The 1990-2020 Draft Inventory has not yet been approved.

dioxide is part of this global carbon cycle, and therefore its fate is a complex function of geochemical and biological processes. Carbon dioxide concentrations in the atmosphere increased from approximately 280 parts per million (ppm) in pre-industrial⁴ times to 409.8 ppm in 2019, a greater than 46 percent increase (NOAA 2020; IPCC 2007). The annual rate of increase in atmospheric carbon dioxide over the past 60 years is about 100 times faster than previous natural increases, such as those that occurred at the end of the last ice age 11,000-17,000 years ago. Emissions of CO₂ from fossil fuel use and from the effects of plant and soil carbon are the primary sources of increased atmospheric CO₂ (IPCC 2007).

Management of agricultural soils can lead to carbon dioxide emissions. Carbon dioxide flux from changes in non-forest carbon stocks are associated with four categories of land-use/land management activities: (1) liming of soils; (2) activities on organic soils, especially cultivation and conversion of pasture and forest; (3) activities on mineral soils, especially land-use change activities; and (4) changes in agricultural management practices (e.g., tillage, erosion control). Limestone and dolomite are often applied to reduce acidity of soils. When these compounds are added to the soil they dissolve, releasing CO₂ (EPA 2021a).

Activities at animal confinement facilities in general are being developed on existing cultivated land, and would have little direct effect on CO₂ since the greenhouse gas emissions are already directly estimated on existing tilled land. Merced County, however, does not have a grading or other ordinance to guide existing tillage practices or the liming of soils to minimize effects of current practices. Indirectly, the expansion of a dairy operation would lead to more fuel consumption through electricity consumption, farming operations for food and manure disposal, and deliveries and general maintenance. The potential greenhouse gas effects of these activities will be estimated in terms of their equivalent CO₂ impacts.

Methane (CH₄). Methane, an odorless gas, is produced through the anaerobic decomposition of organic matter; it is emitted from a variety of both human-related (anthropogenic) and natural sources. Agricultural processes such as wetland rice cultivation, enteric fermentation in animals, and the decomposition of animal wastes emit methane, as does the decomposition of municipal solid wastes. Methane is also emitted during the production and distribution of natural gas and petroleum, and is released as a by-product of coal mining and incomplete fossil fuel combustion. Natural sources of methane include wetlands, termites, oceans, sediments, volcanoes, and wildfires (EPA 2021b).

While Methane has a Global Warming Potential⁵ of 21 and is a potent climate pollutant, it has a short lifespan of approximately 12 years before it is broken down via oxidation and removed from the atmosphere, while carbon dioxide has a longer-lasting effect (EPA 2021b; Saunio et al. 2020).

In 2019, methane accounted for about 10 percent of all U.S. greenhouse gas emissions from human activities (EPA 2021b). Methane emissions in the United States decreased by 15 percent between 1990 and 2019. During this time period, emissions increased from sources associated with agricultural activities, while emissions decreased from sources associated with landfills, coal mining,

⁴ The pre-industrial period is defined as the time preceding the year 1750 (IPCC 2007).

⁵ Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. The IPCC developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. Carbon dioxide is used as a reference gas for GWP, with a value of 1.

and from natural gas and petroleum systems. It is estimated that 50-65 percent of global methane emissions are related to human-related activities (EPA 2021b).

Methane produced as part of the normal digestive processes of animals and manure management represent approximately 36.6 percent of total methane emissions from human-related activities in the United States in 2019 (EPA 2021a). Of the domestic animal types, emissions from dairy cattle in the United States accounted for approximately 24 percent of the total ruminant livestock methane generated (EPA 2021a). The relative proportion of methane sources may not be strictly applicable to Merced County, but the data provide some perspective. Sources of methane emissions associated with animal confinement facilities are further discussed below.

Animals. Methane is a natural by-product of animal digestion. During digestion, methane is produced through a process referred to as enteric fermentation, in which microbes that reside in animal digestive systems break down feed consumed by the animal. This methane is exhaled or belched by the animal, and accounts for the majority of emissions from ruminants. Ruminants, which include cattle, buffalo, sheep, goats, and camels, have higher methane emissions than other types of animals because of their unique digestive system. Ruminants possess a rumen, or large “fore-stomach,” in which a significant amount of methane-producing fermentation occurs. Non-ruminant domestic animals, such as pigs and horses, have much lower methane emissions than ruminants because much less methane-producing fermentation takes place in their digestive systems. Approximately 200 species and strains of microorganisms are present in the digestive system of ruminant animals, although only a small portion, about 10 to 20 species, are believed to play an important role in ruminant digestion. The microbial fermentation that occurs in the rumen enables ruminant animals to digest coarse plant material that monogastric animals⁶ cannot digest.

The amount of methane produced by domesticated animals depends primarily on the type of animal (i.e., ruminant or non-ruminant), the age and weight of the animal, and the quantity and quality of the feed consumed. The quality of the feed depends on the physical and chemical characteristics of the feed, and whether feed additives have been added to promote production efficiency. Other factors that influence methane emissions are the feeding schedule, and the activity level and health of the animal.

Manure Decomposition. Manure decomposition is a process in which microorganisms derive energy and material for cellular growth by metabolizing organic material in manure. When decomposition occurs without oxygen (i.e., anaerobic decomposition), methane is an end product of the process (EPA 2021b).

In general, livestock manure is highly conducive to methane generation due to its high organic content and large bacterial populations. In addition, the specific methane-producing capacity of livestock manure depends on the specific composition of the manure, which in turn depends on the composition and digestibility of the animal diet. The greater the energy content and digestibility of the feed, the greater the methane-producing capacity of the resulting manure. For example, feedlot cattle eating a high-energy grain diet produce highly biodegradable manure with a high methane-producing capacity. Range cattle eating a low energy forage diet produce a less biodegradable

⁶ Monogastric animals have a mouth, esophagus, stomach, small intestines, large intestines, pancreas, and liver. Examples of monogastric animals include swine, dogs, monkeys, and humans.

manure with only half the methane-producing capacity of feedlot cattle manure⁷ (EPA 2021a). While a higher quality feed results in lower methane emissions from enteric fermentation and higher methane emissions from manure decomposition, enteric fermentation is a larger source of greenhouse gas emissions, and increasing the quality of feed generally results in a net reduction in greenhouse gas emissions on a dairy (EPA 2021a).

The principal factor affecting the methane actually produced from manure decomposition is manure management and climate. Methane production will only occur under anaerobic conditions, such as anaerobic lagoons. Manure that is managed in liquid form under warm conditions for an extended period of time promotes increased methane formation. Manure managed as dry material (aerobic conditions) in a cold climate does not readily produce methane.

From 1990-2019, methane emissions from manure management have increased by 68 percent in the United States. Swine and dairy cow manure account for the majority of this increase with an increasing trend of using liquid systems for manure management, which tends to produce greater methane emissions. The increase in liquid systems is the combined result of a shift to larger facilities, all of which tend to use liquid systems. Also, new regulations limiting the application of manure nutrients have shifted manure management practices at smaller dairies from daily spread to manure managed and stored on site (EPA 2021a).

Nitrous Oxide (N₂O). Anthropogenic sources of N₂O emissions include agricultural soils (*especially the use of synthetic and manure fertilizers*); fossil fuel combustion (*especially from mobile sources*); adipic (nylon) and nitric acid production; wastewater treatment and waste combustion; and biomass burning. The atmospheric concentration of N₂O in 2018 was about 331 ppb, which represents about 123 percent of pre-industrial levels (WMO 2019). The majority of this increase has occurred after the pre-industrial period and is most likely due to human activities. Nitrous oxide is removed from the atmosphere primarily by the photolytic action of sunlight in the stratosphere. N₂O has an atmospheric lifetime of more than 100 years, and over a 100-year period, each molecule of N₂O has a direct global warming potential 265-298 times that of a single molecule of CO₂ (EPA 2021a).

Sources of N₂O emissions associated with animal confinement facilities are discussed below.

Manure Decomposition. Manure decomposition is a process in which microorganisms derive energy and material for cellular growth by metabolizing organic material in manure. When decomposition occurs without oxygen (i.e., anaerobic decomposition), methane is an end product of the process (EPA 2021a). N₂O is also produced during the manure decomposition process. Production of N₂O during the storage and treatment of animal wastes occurs by combined nitrification - denitrification⁸ of nitrogen contained in ammonia (NH₃) that is present in the wastes. The quantity of N₂O produced during manure decomposition depends on the manure and urine composition, the type of bacteria involved in the decomposition process, and the amount of oxygen and liquid present in the manure management system. The amount of N₂O ultimately released depends on the management

⁷ While a higher quality feed results in lower methane emissions from enteric fermentation and higher methane emissions from manure decomposition, enteric fermentation is a larger source of greenhouse gas emissions, and increasing the quality of feed generally results in a net reduction in greenhouse gas emissions on a dairy (EPA 2018).

⁸ Denitrification is the process by which nitrates or nitrites are reduced by bacteria, which results in the release of nitrogen into the air. Nitrification is the process by which bacteria and other microorganisms oxidize ammonium salts to nitrites, and further oxidize nitrites to nitrates.

system and the duration of waste management. Indirect N₂O emissions are produced when N is lost from the system through volatilization (as NH₃ or NO_x) or through runoff and leaching (EPA 2021a).

Agricultural Soil Management. The management of agricultural soils produces the majority of N₂O emissions in the United States. A number of agricultural activities add nitrogen to soils, thereby increasing the amount of nitrogen available for nitrification and denitrification, and ultimately the amount of N₂O emitted. These activities may add nitrogen to soils either directly or indirectly. Direct additions occur through various cropping practices (i.e., application of synthetic and organic fertilizers, daily spread of animal wastes, production of nitrogen-fixing crops, and incorporation of crop residues), and through animal grazing (i.e., direct deposition of animal wastes on pastures, range, and paddocks by grazing animals). Indirect additions occur through two mechanisms: (1) volatilization of applied nitrogen (i.e., fertilizer and animal waste) and subsequent indirect emissions of that nitrogen as NH₃ and NO_x; and (2) surface runoff and leaching of applied nitrogen into surface water and groundwater (EPA 2021a).

A number of conditions can affect nitrification rates in soils, including water content, which regulates oxygen supply; temperature, which controls rates of microbial activity; nitrate or ammonium concentrations, which regulate reaction rates; available organic carbon, which is required for microbial activity; and soil pH, which is a controller of both nitrification and denitrification rates and the ratio of N₂O / N₂ from denitrification. These conditions vary greatly by soil type, climate, cropping system, and soil management regime. (EPA 2021a)

Activities at animal confinement facilities would have little effect on N₂O emissions from agricultural fields since all new and expanding facilities are assumed to be developed on existing cultivated land, animal wastes used as fertilizer would replace all or a portion of existing synthetic fertilizers used, and no feature of general best practices in the San Joaquin Valley would require the application of greater amounts of fertilizer than those currently used.

Black Carbon. Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Diesel particulate matter emissions are a major source of black carbon, primarily from developing countries.

Carbon Sequestration

Carbon storage (sequestration) occurs in forests and soils primarily through the natural process of photosynthesis. Atmospheric carbon dioxide is taken up through leaves and becomes carbon in the woody biomass of trees and other vegetation. Approximately half of vegetation mass (biomass) is carbon. When vegetation dies and decays, some of this carbon makes its way into soils; however, carbon (in the form of carbon dioxide) can return to the atmosphere when agricultural tillage practices stir up soils or when biomass decays and/or burns. Forests and agricultural soils can both sequester and release carbon dioxide, and the net effect is dependent upon site-specific circumstances.

The term “sinks” is used to refer to forests, croplands, and grazing lands, and their ability to sequester carbon. Agriculture and forestry activities can release CO₂ to the atmosphere. Therefore, a carbon sink occurs when carbon sequestration is greater than carbon releases over some time

period. Carbon sequestration rates vary by tree species, soil type, regional climate, topography, and management practice.

Carbon can be sequestered in forests/woodlands over decades or even centuries, until mature ecosystems reach a stage of carbon saturation; however, as natural decay or other events such as fire or harvesting occur, carbon is released back to the atmosphere as carbon dioxide. Carbon from forests can be stored in wood products like furniture and housing lumber for up to several decades. However, ultimately much of the carbon in wood products eventually decays and can be released back to the atmosphere as carbon dioxide (EPA 2021a). And if carbon sequestration practices in agriculture, such as reduced tillage, are abandoned or interrupted, most or all of the accumulated carbon can be quickly released. When the carbon cycle transfers more carbon to the atmosphere this can lead to global warming. Over the last 300 years atmospheric levels of carbon have increased by more than 30 percent, of which approximately 65 percent is attributable to fossil fuel combustions and 35 percent is attributed to deforestation and the conversion of natural ecosystems to agricultural use (Pidwirny 2006). Globally, forest sequestration of carbon offsets approximately 20 percent of GHG emissions from the agriculture and forestry sector (EPA 2021a).

CALIFORNIA GREENHOUSE GAS EMISSIONS

California carbon dioxide equivalent (CO₂e) emissions were approximately 418.2 million metric tons in 2019⁹, 7.0 million metric tons CO₂e lower than 2018 levels and almost 13 million metric tons CO₂e below the 2020 GHG Limit of 431 million metric tons CO₂e. During the 2000 to 2019 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 14.0 metric tons per person to 10.5 metric tons per person in 2019, a 25 percent decrease. Of GHG emissions from within California, approximately 40 percent is from transportation, 21 percent is from industry, 14 percent from electric power generation, 11 percent residential and commercial uses, 5 percent High GWP (refrigerants), and 2 percent recycling and waste¹⁰. Agriculture, including fuel use by agricultural support activities, comprises 7 percent of the state's GHG emissions (ARB 2021).

Agricultural activities are the dominant source of GHG emissions within Merced County (69 percent of total 2010 emissions in unincorporated Merced County, and 42 percent of total 2010 countywide emissions, including the incorporated cities). Transportation activities are the second leading source of GHG emissions (23 percent in unincorporated Merced County and 39 percent in total Merced County during 2010) (Merced County 2013).

AGRICULTURE AND ADAPTATION

With climate change and the increased potential for more frequent and severe droughts, less water stored in the Sierra snowpack, increased pests and invasive species, heat waves, and other impacts, California agriculture is vulnerable to increasing risks. Agencies, industry leaders, and farmers are exploring adaptation strategies to address the changing climate. In addition, there are opportunities in agriculture for reducing greenhouse gas emissions, including research efforts on N₂O emissions, coordinated regulatory response to siting of dairy digesters, and the development of offset protocols. As discussed in the regulatory setting of this Chapter, mitigation and adaptation plans are being developed to protect agriculture and the food supply. For the purposes of this project-level dairy

⁹ As of April 2022, the 2000-2019 greenhouse gas emissions inventory is the most recent one available for California.

¹⁰ 2019 GHG Emissions by Scoping Plan Category.

expansion EIR, project impacts will focus on GHG emissions from existing and proposed dairy operations.

8.2.2 ELECTRICITY AND ENERGY USE IN CALIFORNIA DAIRIES

There are several major electric energy use categories generally found on California dairies (Southern California Edison 2004), not including feed production. These categories and the approximate distribution of electric energy use on a representative dairy farm in California include:

- Milk Harvest (12%)
- Lighting (13%)
- Waste Handling (24%)
- Compressed Air Systems (4%)
- Milk Cooling (27%)
- Air circulation and Ventilation (10%)
- Water Systems (8%)

Milk cooling and waste handling consume the most energy of all use categories. Washing and water heating is not included in the distribution because fossil fuel is primarily used to heat water (Southern California Edison 2004).

The Energy Utilization Index (EUI) refers to the amount of energy used to accomplish a particular activity or process. EUIs can help to determine overall dairy farm energy efficiency and identify process or equipment changes that would result in a reduction of energy consumption. A typical dairy's EUI can vary greatly depending on the size of the farm, housing and milk harvest methods, use of energy-conserving technology, and the use of electric technologies for lighting, ventilation/air circulation, waste, and material handling. EUIs have been found to range from as low as 300-400 kWh per cow-year to over 1,500 kWh per cow-year. Studies of electricity use on dairies in the San Joaquin Valley show average electrical energy use is about 504 kWh per cow-year (Merced County 2013). Lower EUI values are typically found on large freestall, milking parlor dairies that use: (1) high-efficiency milk cooling systems, (2) variable speed drive vacuum and milk pumps, (3) heat recovery, as this affects milk cooling, (4) high-efficiency lighting, (5) limited application of air circulation equipment, (6) less complicated waste handling systems, (7) efficient water heating (for electric water heating), (8) efficient farmstead layouts, and (9) effective cost control methods. Farms with high EUIs generally indicate: (1) smaller production units, (2) lower production efficiencies, and (3) older, less efficient equipment (Southern California Edison 2004). Incorporation of more energy-efficient systems can be used to effectively manage energy costs and increase profitability.

8.3 ENVIRONMENTAL EFFECTS

8.3.1 SIGNIFICANCE CRITERIA

As set forth in Appendix G to the State CEQA Guidelines, Section VIII, Greenhouse Gas Emissions, and Section VI, Energy, this analysis considers impacts to be significant if implementation of a proposed action would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. (*VIII.a*)
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*VIII.b*)

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. (VI.a)
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (VI.b)

SIGNIFICANCE THRESHOLDS

Merced County has not established significance criteria for GHG emissions. Many adopted GHG emission reduction strategies have few or limited agricultural measures, making compliance with these strategies as a threshold an illogical choice. In an effort to capture both large increases in GHG emissions and large emitters of GHGs, for the purposes of this EIR, the project's contribution to GHG emissions would be considered significant if either of the following apply:

- The increment of increase of the project's GHG emissions would be greater than 10,000 t/yr of CO₂e.
- The increment of increase of the project's GHG emissions would be less than 10,000 t/yr of CO₂e, but the total project facility's GHG emissions (existing plus project increment) would be greater than 25,000 t/yr of CO₂e (or greater than a 3,200-mature-cow dairy herd as based on the EPA's Final Mandatory GHG Reporting Rule).

These numeric thresholds would only be applicable to dairies, and would not apply to industrial, commercial, residential, or other development types (see Appendix F-4 of this EIR for a detailed discussion of GHG emissions thresholds for the project).

State CEQA Guidelines Section 15126.2(b) requires that if analysis of a project's energy use shows that the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary consumption use of energy, or wasteful use of energy resources, then mitigation measures must be included to reduce that impact. CEQA Guidelines Appendix F describes the types of information and analyses related to energy conservation to be included in an EIR. Energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

8.3.2 ENVIRONMENTAL IMPACTS

All project-related construction and operational activities as described in Chapter 3, *Project Description* would generate some level of greenhouse gas emissions and/or energy use, and thus are being assessed as part of this EIR. Naturally occurring greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, and ozone. There are also several gases that, although they do not have a direct radiative forcing effect, do influence the formation and destruction of ozone, which does have such a terrestrial radiation absorbing effect. These gases, referred to as ozone precursors, include reactive organic gases (ROG/VOC) and oxides of nitrogen. These latter two gases are evaluated in Impact AQ-3, found in Chapter 5, *Air Quality and Odors*, of this EIR.

Impact GHG-1: Greenhouse gas emissions from project construction and operation (Criterion VIII.a)

Construction and operation of the Hillcrest Dairy Expansion project would result in greenhouse gas emissions from direct and indirect sources. Because the proposed project would exceed established significance thresholds for GHG emissions, this would be a significant impact.

Construction activities associated with the Hillcrest Dairy Expansion project would result in short-term CO₂ emissions, a greenhouse gas. Construction-related emissions were calculated using CalEEMod Version 2020.4.0 (see Appendix G, *Health Risk Assessment and Ambient Air Quality Analysis* for construction modeling results). GHG emissions from site preparation and facilities construction for the proposed project would result in total emissions of approximately 361 metric tons of CO₂e over two years (see Table 8-1).

Table 8-1 Construction Related Greenhouse Gas Emissions	
Construction Phase and Year	Greenhouse Gas Emissions (metric tons/year of CO₂e)
Phase 1: 2022 Emissions ⁽¹⁾	147.3
Phase 2: 2022 Emissions	106.3
Phase 2: 2023 Emissions	107.4
Total Emissions	361.0

Notes: Calculations completed in March 2022. CO₂e = carbon dioxide equivalents.

1 See CalEEMod calculation assumptions in Appendix A of the Health Risk Assessment and Ambient Air Quality Analysis included as Appendix G of this EIR. Phase 1 would include 63,678 square feet of construction, and Phase 2 would include 132,000 square feet of construction.

Source: Trinity Consultants 2022, Planning Partners 2022.

Greenhouse gases associated with operations of confined animal and agricultural activities include methane, nitrous oxide, ozone, and carbon dioxide. Several sources of these greenhouse gases are associated with animal confinement facilities: animal metabolic activity and animal housing; manure decomposition in waste deposits, treatment and storage areas, and field applied manure; on-field cultivation; fuel consumption; electricity use; and feed cultivation and transport.

Milk production is the commercial dairy operation's single largest source of GHG emissions, at approximately 59 percent of total emissions. On the dairy farm, the most significant source of greenhouse gas emissions is the dairy cow: estimates of 35-80 percent (mean 50 percent) of GHG emissions are due to methane from enteric fermentation. Growing feed, both on dairies and crop farms, is milk's second most GHG-intensive process (Wightman 2008). The primary sources of these emissions include the production of commercial fertilizer, fuel use in machinery, and on-field production of nitrous oxide due to nitrification and denitrification of nitrogen (both chemical and organic) (Innovation Center 2008). Approximately 9-53 percent (mean 30 percent) of GHG emissions are from nitrous oxide emissions (manure management and nitrous fertilizers), and 16 percent of GHG emissions are from carbon dioxide coming from tractors, trucks, and electricity production (IDF 2009).

The digestibility of feed has a strong effect on the GHG emissions per kilogram of milk product; a 10 percent increase in feed digestibility in an intensively managed¹¹ system can reduce GHG emissions by approximately 10 percent (FAO 2010). In practice, however, the quality of the feed is interrelated with milk production and growth, so looking at the combined effect of changes in feed quality, milk production, and growth is more realistic. If an increase in milk production by 10 percent is assumed, parallel to the increased digestibility, the GHG emissions are reduced by 15.4 percent. In the situation where the growth rate is also increased, the GHG emissions are further reduced (FAO 2010). Today, many producers already reduce enteric methane emissions by maximizing feed efficiency and increasing production per cow.

To reduce emissions from manure, anaerobic digesters are becoming a more common solution. There are approximately 261 anaerobic digester systems in operation at commercial dairy farms in the United States, with 77 located in California (database updated November 1, 2021) (EPA 2021c). There are an additional 6 dairy digesters located in California listed under construction with anticipated completion within the year. As set forth in Chapter 13, *Alternatives Analysis*, of this EIR, Alternatives 2 and 3 evaluate the environmental effects of the proposed project as modified to include a digester.

For an evaluation of electricity use and energy efficiency on the proposed Hillcrest Dairy Expansion project, please refer to Impact GHG-2.

Studies have shown that the use of best management practices, rather than the size or location of the dairy farm, makes the biggest difference in reducing GHG emissions (Paustian et. al. 2006). No provisions of the Animal Confinement Ordinance (ACO) or SJVAPCD regulations directly address methane or CO₂ emissions, but Chapter 18.64.050 U of the ACO applies to air emissions in general (see Appendix C). Because the decomposition of manure is one source of methane emissions, measures to comply with ROG limitations required by Chapter 18.64.050 U of the Merced County Code and a SJVAPCD Permit to Operate would also reduce methane emissions.

For this EIR, GHG emissions were estimated using the Dairy Gas Emissions Model, Version 3.3, from the Pasture Systems and Watershed Management Research Unit, Agricultural Research Service, United States Department of Agriculture. The Dairy Gas Emissions Model is a software tool for estimating the greenhouse gas emissions and carbon footprint of dairy production systems (USDA 2016; Denef et. al. 2012). The full production system extends beyond farm boundaries, and is defined to include emissions during the production of all feeds, whether produced on the farm housing the dairy or elsewhere. It also includes emissions that occur during the production of resources used on the farm such as machinery, fuel, electricity, and fertilizer. For a more detailed description of the model and results, including model inputs, see Appendix F-3.

Carbon dioxide emissions include daily values from animal respiration and microbial respiration in manure on the barn floor and during manure storage. Also included is the net annual flux of carbon dioxide in feed production – emissions of CO₂ assimilated in the feed minus that in manure applied to cropland. Carbon dioxide emissions from fuel combustion in farm engines are also included. Methane emissions include those from enteric fermentation, the barn floor, manure storage, and manure deposited in pasture. Nitrous oxide emissions are emitted from crop and pasture land during the production of feeds, with minor emissions from the manure storage and barn floor. Emissions

¹¹ Intensive dairy systems typically involve large numbers of animals raised on limited lands.

include both primary and secondary sources. Total greenhouse gas emission is determined as the sum of the net emissions of the three greenhouse gases where methane and nitrous oxide are converted to carbon dioxide equivalent units (CO₂e).

The net emission is determined through a partial life cycle assessment of the production system, including both primary and secondary sources. Primary emissions are those emitted from the farm or production system during the production process. Secondary emissions are those that occur during the manufacture or production of resources used in the production system. These resources include machinery, fuel, electricity, fertilizer, pesticides, plastic, and any replacement animals not raised on the farm. Secondary emissions from the manufacture of equipment are apportioned to the feed produced or manure handled over their useful life. Electricity use is the total of that used for milking, milk cooling and related milking activities, and that used for barn lighting and ventilation. Table 8-2 shows the total project-generated GHG emissions.

Table 8-2 Greenhouse Gas Emissions for Existing and Proposed Operations – Partial Life Cycle Assessment of the Dairy Production System			
	Source	Total Annual CO₂e ⁽¹⁾ (metric tons) Existing	Total Annual CO₂e (metric tons) Proposed
Total Greenhouse Gas (CO ₂ e)	Animal emissions	23,129	28,078
	Manure emissions	18,468	19,597
	Feed production ⁽²⁾	1,955	2,409
	Net Biogenic CO ₂ ⁽³⁾	-28,381	-36,980
	Fuel combustion	1,072	1,247
	Secondary sources	15,278	18,756
	Not allocated to milk ⁽⁴⁾	-12,514	-13,785
	Net emissions	19,008	19,323
GHG Increase from Project (Annual metric tons CO₂e)			314

1. CO₂e – carbon dioxide equivalent emissions, which is the sum of all emissions after multiplying by their global warming potentials. Given values represent the estimated mean emissions over all simulated years.
2. Emissions during the production of all feed crops are included whether those feeds are produced on the same farm with the animals or they are purchased from another farm.
3. Carbon dioxide emissions include daily values from animal respiration and microbial respiration in manure on the barn floor and during manure storage. Also included is the net annual flux of carbon dioxide in feed production: emissions of CO₂ assimilated in the feed minus that in manure applied to cropland. Carbon dioxide emissions from fuel combustion in farm engines are included. Net biogenic carbon dioxide emissions are negative because of the amount of CO₂ assimilated in the feed, which in effect represents a removal of CO₂ via its continued storage in the feed and subsequently the animal consuming the feed.
4. Not allocated to milk – represents emissions attributed to the production of the calves and cull cows sold. Because the model incorporates the entire production system, keeping these emissions would represent an unfair bias against milk production.

Source: Planning Partners, 2022 - see Appendix F-3 of this EIR.

As estimated above in the partial life cycle assessment, the expanded project operations would result in the net emissions of approximately 19,323 metric tons of CO₂ equivalents per year, with an increase of 314 metric tons CO₂e from existing operations.

There are alternate calculation methodologies that consider direct emission sources from dairy operations, rather than the partial life cycle assessment methodology. These methodologies generally result in larger overall GHG emissions since they do not include emission sinks that are used in the partial life cycle assessment methodology. Due to the large number of animals at the proposed dairy, this analysis considers both the selected partial life cycle assessment above, in addition to calculation of direct emission sources on the dairy farm, as described below.

For a calculation of direct emissions from the dairy farm, this analysis considers emissions from on-site operations, including animal and manure management, mobile sources, and secondary emissions from energy use on the farm. Based on the SJVAPCD dairy calculator (dated January 2020), the dairy herd would result in the emissions of approximately 39,179 metric tons of CO₂e/yr from proposed operations, with an increment of increase of 7,203 metric tons from existing operations (see Appendix F). Additional GHG emissions resulting from increased mobile source emissions from truck trips and dairy operational equipment (such as the feed loader) is estimated at 55 metric tons CO₂e (see CalEEMod data in Appendix F). While there would be no direct emissions of GHG from energy use, increased electricity use for operations would result in secondary GHG emissions. Based on monthly energy use provided by the project applicant and emission factors provided by the EPA, secondary GHG emissions from electricity use currently results in approximately 277 metric tons CO₂e per year for existing operations (see Appendix F for GHG emission calculations from electricity use). Assuming the same electricity use per cow, the proposed expansion would result in approximately 335 metric tons CO₂e per year from secondary GHG emissions from electricity use, or an increase of 58 metric tons CO₂e per year. There would be no increase in GHG emissions from field cultivation since there would be no change in acreage or cropping patterns. See Table 8-3 for a summary of increased GHG emissions as a result of the dairy expansion.

Table 8-3 Increment of Increase of Greenhouse Gas Emissions from the Hillcrest Dairy Expansion – Emissions from Animals and Manure Management, Mobile Sources, and Electricity			
Increased GHG from Herd	Increased GHG from Mobile Source	Increased GHG from Electricity	Total Increment of Increased GHG Emissions
7,203 (metric tons CO ₂ e/yr)	55 (metric tons CO ₂ e/yr)	58 (metric tons CO ₂ e/yr)	7,317 (metric tons CO₂e/yr)

Notes: See Appendix F of this EIR for calculations.

- (1) GHG emissions from the herd were estimated using the SJVAPCD dairy emissions calculator dated January 2020.
- (2) GHG emissions from mobile sources were estimated using CalEEMod Version 2020.4.0.
- (3) Electricity use for a representative month was provided by the project applicant, and GHG emissions were calculated using eGRID emission rates for California (<https://www.epa.gov/egrid>).

Source: Planning Partners 2022.

Based on the estimates included in Table 8-3, the dairy expansion would result in an overall increase of 7,317 metric tons CO₂e per year from existing operations, which is less than the 10,000 t/y CO₂e significance threshold. However, the estimated net emissions of 39,179 metric tons CO₂e per year for the herd would qualify as a major source of greenhouse gas emissions as established by the EIR significance threshold of 25,000 t/y CO₂e. The proposed expansion would house a total of 5,750 mature dairy cows, which is above the minimum average annual animal population of 3,200 mature dairy cows (not including calves and heifers) identified by the EPA greenhouse gas mandatory reporting regulation^{12,13}. Since both the existing and proposed dairy herd would exceed 3,200 mature cows as identified by the EPA as a conservative threshold, this would be a significant impact.

At this time, there is no adopted methodology or Best Management Practices for reducing GHG emissions for a dairy operation either locally or through the SJVAPCD. Further, as described in the regulatory setting above, the Legislature has determined that GHG emissions reductions from dairies statewide will remain voluntary through 2023. However, many water quality and soil health BMPs commonly used on a dairy farm are also good GHG emission reduction practices. The existing Hillcrest Dairy operations include the following GHG emission mitigation strategies to reduce GHG emissions from enteric methane, manure, and energy sources as identified by the CARB and other resource papers:

Enteric Methane

- Diet management
- Herd management
- Cow comfort and well-being

Manure

- Renewable fertilizers
- Nutrient and water recovery
- Solid separation

Energy

- Renewable energy from solar source
- LED lighting
- Variable speed pumps
- Milk pre-cooling technology

As set forth by CARB the recent *Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target* (March 2022), while the dairy and livestock sector has made significant progress, it must still achieve considerable methane emissions reductions to meet the 2030 target of 40 percent below 2013 levels. The report identifies two primary methods for reducing manure methane emissions, including installation of an anaerobic digester and alternative manure management practices. However, “the cost to procure biomethane can be about 10 times more expensive than fossil natural gas”, and therefore incentives are needed for California’s dairy sector to adopt these methane reduction strategies (CARB 2022). Alternative manure management practices have also been difficult to move forward, since resultant emissions reductions are inconsistent across the same project types and difficult to quantify. Feed additives are an additional methodology for reducing enteric reductions that has made limited progress in overcoming both technical or market barriers; no feed additives with demonstrated long-term methane mitigation potential have been approved by the U.S. Food and Drug Administration and are commercially available (CARB 2022).

¹² The Rule applies to livestock facilities with manure management systems, but does not require reporting of emissions of methane via enteric fermentation or land application of manure, which are included in proposed project calculations. Based on the SJVAPCD dairy calculator (dated January 2020), the dairy herd would result in the emissions of approximately 39,179 metric tons of CO₂ equivalents per year from operations, with an increase of 7,203 metric tons from existing operations. However, the project cropland acts as a carbon sink and results in a reduction in net emissions.

¹³ While the EPA is currently not implementing subpart JJ, Manure Management of the Mandatory GHG Reporting Rule, and dairies that appear to fall under this rule do not currently need to report, it is recommended that these dairy operators maintain records on their manure management systems in accordance with the Rule should they be requested for data in the future.

Should Best Management Practices for the reduction of GHGs from dairy operations be adopted, the Hillcrest Dairy would likely be required to meet those standards, as adopted by the State, SJVAPCD, or County.

Because the proposed project would exceed 3,200-mature cows and established significance thresholds for GHG emissions even after the implantation of best management practices, this would be a significant impact.

Significance of Impact: Significant.

Mitigation Measure GHG-1a:

Implement Mitigation Measure AQ-3a, which requires implementation of all air quality provisions of the ACO and compliance with SJVAPCD Rules, several of which would also act to reduce methane emissions.

Mitigation Measure GHG-1b:

Prior to the issuance of a building permit, the project sponsor shall implement Alternative 2, Alternative 3, or Alternative 4 in Chapter 13, *Alternatives Analysis*, of this EIR, should they be determined to be feasible. This would include modification of the existing waste management system with construction of a dairy digester on the project site, as described in the Alternatives Chapter.

Potential Environmental Effects of Measures: On-site facilities necessary to comply with the above measures would be constructed within the overall facility footprint of the Hillcrest Dairy site as assessed in Chapters 5-11 of this EIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Even after imposition of the identified mitigation measure, this would be a significant and unavoidable impact for the following reasons: the measures required by the above Mitigation Measure GHG-1a would not be sufficient to reduce project GHG emissions below the threshold of significance; the dairy digester cited in Mitigation Measure GHG-1b may be considered financially infeasible without financial assistance, and even if the project applicant applied for funding assistance, funds may not be awarded. Further, installation of the dairy digester still may not reduce project GHG emissions below the threshold of significance. The ultimate success of implementing Mitigation Measure GHG-1b is contingent on a favorable award of financial incentives to construct the digester; however, Merced County is unable to control the outcome of the financial award and construction of the digester, and hence the effectiveness, of the measure.

Implementation and Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department shall monitor for compliance. Mitigation Measure GHG-1a shall be implemented prior to final inspection or prior to initiation of new operations and throughout ongoing operations. Mitigation Measure GHG-1b shall be implemented prior to issuance of a building permit and throughout ongoing operations.

Impact GHG-2: Wasteful or inefficient consumption of energy (Criterion VI.a)

Construction and operation of the Hillcrest Dairy Expansion project would result in the use of electricity, natural gas, and other fossil fuels. Because the operations at the Hillcrest Dairy would be considered energy efficient from a regional and statewide perspective, and existing energy efficiency measures have been applied to project operations, this would be a less-than-significant impact.

Proposed dairy and agricultural operations at the Hillcrest Dairy Expansion project site require the use of electricity, natural gas, and other fossil fuels associated with agricultural production. Development of the proposed dairy expansion project would entail energy consumption that includes both direct and indirect expenditures of energy. Indirect energy would be consumed by the use of construction materials for the project (e.g., energy resource exploration, power generation, and mining and refining of raw materials into construction materials used, including placement). Direct energy impacts would result from the total fuel consumed in vehicle propulsion (e.g., construction vehicles, and increased use of heavy equipment and other vehicles using the facility). No unusual materials, or those in short supply, are required in the construction of the project.

Dairy operators continue to seek ways to become more efficient, since electricity costs can determine whether the dairy farm can remain competitive. Pacific Gas and Electric Company (PG&E) offers rebates on a range of energy efficient equipment, including irrigation, mechanical controls, ventilation, and lighting. There are several options for dairy farms to improve energy efficiency, depending on the farm operations and overall needs. In the milking process, energy efficiency can be improved for refrigeration and vacuum pumps. Plate coolers, which capture heat from milk and transfer it to cold water, can reduce cooling time by as much as 15 to 30 minutes. The warmed water can be used to preheat water for other uses, such as wash down of cattle and milking parlors. Also, a refrigeration heat exchanger transfers the excess heat from the milk cooler to preheat water for use in the barn. A variable frequency pump/drive adjusts energy use to meet the milking need and can result in energy savings of 50-80 percent. Variable frequency drives can be used for varying loads such as milk pumps, vacuum pumps, and ventilation fans (UMass Extension 2011).

Lighting on the dairy farm is another opportunity for energy and cost savings. Increased lighting can increase milk production and maintain reproductive performance: dairy cows given 16 hours of light continuously each day will increase milk production from 5 to 16 percent, and increase feed intake by about 6 percent compared to cows receiving 13.5 hours or less of light. Changing electric lighting from incandescent lights to fluorescent, high pressure sodium lamps, or Light Emitting Diodes (LED) can provide all the lighting that the animals need, at a reduced cost of operation, and with a large increase in energy conservation. Switching from incandescent to more energy efficient lights can save energy needed for lighting by 75 percent. (USDA 2006)

To reduce electricity use and increase efficiency, conducting energy audits on a dairy and acting on those recommendations have generated significant cost savings and reduced GHG emissions from energy use. The energy efficiency savings identified in a farm energy audit vary greatly, and are not correlated with farm size. However, it is estimated that, as a rough average, farms across the U.S. may be able to achieve 10 percent to 15 percent energy savings through a farm energy audit (Innovation Center 2008).

At the Hillcrest Dairy, an energy audit was completed for the facility around 2019, and several energy efficiency upgrades have been incorporated into existing operations at the active dairy

facilities. The milking system operates with a vacuum pump with a variable speed drive motor, and there is a plate cooler system for milk cooling. During the day, only natural lighting is necessary. Night lighting at the facility includes LED lighting on cow housing and the milking parlor. These features of the Hillcrest Dairy operations and proposed improvements would be considered relatively energy efficient (EnSave 2012). There are a few less energy-efficient aspects of the facility, as there is currently no heat recovery unit, and there are milk cooling compressors that are older than five years.

There is an existing solar system located south of the dairy site on North Hayden Road, which provides electrical power through PG&E to the Hillcrest Dairy. Based on monthly energy use provided by the project applicant, energy use at the milk barn and waste management system as reported by PG&E was estimated to be 1,446,790 kWh for the year 2020, which calculates to 179.73 kWh per cow-year for existing operations. This energy use is considered low, but within the range of normal for this size of operation with equipment upgrades in the San Joaquin Valley. As discussed in Section 8.2.2, the average electricity use on dairies in Merced County is about 504 kWh per cow-year, which is rather efficient compared to the high range of 1,500 kWh per cow-year found on other California dairies. Because the dairy uses less energy per cow-year than the average for the region and the State, and uses renewable energy, the Hillcrest Dairy operations would be considered energy efficient.

Considering the recent energy audit and equipment upgrades, the energy requirements of the dairy farm would be considered efficient. Also, while the proposed dairy expansion would result in an increase in energy use, there could be a small increase in energy efficiency since larger farms generally use machines more efficiently, providing some reduction in the machinery required per unit produced (USDA 2016).

Agricultural operations at the dairy farm provide additional opportunity for energy efficiency, though modifications would not be required since the existing operations would be considered energy efficient. The irrigation/tailwater pumps are 5-10 years old and do not have variable speed motors. Regular testing of the irrigation pumps for pumping efficiency is a good way to help determine if it is time for a pump upgrade. Based on the model year of the existing tractor fleet, at least two of the four loaders and tractors have Tier 3 or Tier 4 engines. Newer tractors and trucks with Tier 3 or Tier 4 engines drastically reduce smoke and smog (particulate matter (PM) and Nitrogen Oxides (NO_x)). Even with older equipment, regular maintenance and other practices will help tractors perform more efficiently and reduce fuel use. These practices include: replacing air and fuel filters regularly; checking tire pressures frequently, and replacing worn tires; using proper ballast for each operation; not idling diesel engines over 10 minutes; cleaning dirty fuel injectors; keeping ground-engaging tools sharp; using the right tractor for the job (match the horsepower to the load); combining trips whenever possible, and by modifying equipment if necessary (Cornell 2012; EnSave 2012).

Because the operations at the Hillcrest Dairy would be considered energy efficient from a regional and statewide perspective, and existing energy efficiency measures have been incorporated into project operations, the dairy operations at the Hillcrest Dairy would be considered energy efficient. Further, the dairy facility uses renewable energy for electricity. This would be a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure GHG-2: None required.

Impact GHG-3: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency (Criteria VIII.b and VI.b)

Implementation of the Hillcrest Dairy Expansion project would not be inconsistent with the California Air Resources Board's Climate Change Scoping Plan or California's Long Term Energy Efficiency Strategic Plan since standards and required actions for the reduction of greenhouse gas emissions and energy efficiency in the agricultural sector have not currently been adopted. Therefore, the proposed dairy expansion would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions or promoting renewable energy or energy efficiency, and this would be a less-than-significant impact.

The ARB's Climate Change Scoping Plan represents the primary plan to reduce GHG emissions throughout California. This Plan is designed to reduce California's statewide 2020 GHG emissions by 29 percent as compared to the 2020 Business As Usual scenario and a 2030 GHG emissions reduction target of 40 percent below 1990 levels (ARB 2017a). Due to limited research, and the wide variety of farm sizes, animals, and crops produced, there are few emission reduction or carbon sequestration strategies that can be generally applied to the agricultural sector. Therefore, the key recommended actions in the Scoping Plan for the agriculture sector primarily consist of developing more detailed recommendations and standards to be implemented in the near- and long-term future. Reasonably foreseeable compliance responses associated with the agriculture sector recommendations consist of nitrogen management, manure management, soil management practices, water and fuel technologies, and land use planning to enhance, protect, and conserve lands in California. Senate Bill 1383: Short-lived Climate Pollutants (2016) includes regulations to reduce methane emissions from livestock manure and dairy manure management operations by up to 40 percent below the dairy sector's and livestock sector's 2013 levels by 2030, including establishing energy infrastructure development and procurement policies needed to encourage dairy biomethane projects. The regulations will remain voluntary until they take effect on or after January 1, 2024 (ARB 2017).

The Long Term Energy Efficiency Strategic Plan identifies energy reduction goals for the agricultural sector, with emphasis on reducing energy from agricultural pumping. At this time, the highest priority identified in the Strategic Plan is to conduct baseline studies to understand the energy usage patterns in California's agricultural sector in order to design a cohesive strategy to pursue all cost-effective energy efficiency measures. The GHG gas reduction plans and supporting regulations cited above and in the regulatory setting of this chapter contain strategies that would also result in increased energy efficiency or support renewable energy on dairy farms. For example, SB 1383 requires the establishment of energy infrastructure development and procurement policies needed to encourage dairy biomethane projects to reduce methane emissions from livestock and dairy manure management operations by up to 40 percent below the sector's 2013 levels by 2030. The Scoping Plan, the Long Term Energy Efficiency Strategic Plan, SB 1383, and other GHG emissions reduction, renewable energy, and energy efficiency plans and regulatory measures do not include regulatory requirements immediately applicable to the agricultural sector; rather, as a result of these plans, agencies may establish rules in the future that could apply to the proposed dairy expansion project. Any future dairy expansion project would have to go through the local permitting process, and would have to adhere with the rules in place at that time.

Currently, there are no state, regional, or local policies or requirements in place that are specifically applicable to the project that would result in the reduction of greenhouse gas emissions or the promotion of renewable energy or energy efficiency. Because standards for the reduction of greenhouse gas emissions or increase in energy efficiency in the agricultural sector are not currently in place, the proposed project would not conflict with any plans or regulations adopted for the purpose of reducing the emissions of greenhouse gases or promoting renewable energy or energy efficiency.

Significance of Impact: Less than significant.

Mitigation Measure GHG-3: None required.

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9 NUISANCE CONDITIONS FROM INSECTS

This chapter provides an evaluation of the generation and dispersal of nuisance insects at the proposed Hillcrest Dairy Expansion project. As established in the Initial Study for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), operation of the Hillcrest Dairy Expansion project may result in the potential for nuisance conditions related to insects. Additional potential health hazard assessment criteria have been previously evaluated in the Initial Study/Notice of Preparation (IS/NOP) and will not be evaluated further in this chapter (these less-than-significant impacts are briefly summarized in Section 9.3.1 below).

The following evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the 2030 Merced County General Plan EIR in addition to the EIR for Revisions to the Animal Confinement Ordinance (ACO) and its approval of the ACO.

9.1 REGULATORY FRAMEWORK

9.1.1 MERCED COUNTY MOSQUITO ABATEMENT DISTRICT

The Merced County Mosquito Abatement District is responsible for implementing and enforcing mosquito control measures countywide. Mosquito Abatement Districts are established in accordance with the provisions of California Health and Safety Code Section 2000 et seq. The mission of the Mosquito Abatement District is to provide area-wide mosquito control, prevent mosquito-borne disease, and reduce economic loss and discomfort from mosquitoes.

The Merced County Mosquito Abatement District provides the following guidelines for the construction and management of dairy wastewater systems to prevent significant mosquito production (Bakken, *pers. comm.* 2021):

- Wastewater holding ponds should not exceed 100 feet in width;
- All dairy wastewater holding and solids separator ponds should be surrounded by an access road at least 14 feet in width. The road must be accessible at all times to provide for the use of vehicle-mounted mosquito control equipment;
- All fencing around wastewater and solids ponds should be placed on the outside of the 14-foot lanes with gates to provide easy access.
- All four interior banks of holding and separation ponds should be graded 1:1 or steeper for the first ten feet, soil type permitting, but no greater than 2:1.
- Two or more separator ponds should be used. These ponds should not be more than 60 feet in width.
- No drainage lines should by-pass the separator ponds, except those that provide for normal corral run-off. All such drain inlets must be sufficiently grated to prevent the accumulation of solids in the holding ponds.
- Floatage of any solid substance that could provide harborage for immature mosquito stages should be kept out of all wastewater holding ponds. Mechanical agitators may be very helpful in this regard.

- Prevent vegetative growth from all areas of the wastewater and solids separation ponds. This includes access lanes, interior pond embankments, and any weed growth that might become established on pond surfaces.
- Dairy wastewater used for cropland irrigation purposes shall be managed so that it does not stand for more than three days. Discharges that stand for more than three days could cause severe mosquito emergence.

9.1.2 MERCED COUNTY

The Merced County Division of Environmental Health (DEH) is responsible for implementing and enforcing fly abatement measures countywide. The County's primary fly abatement tool for animal confinement facilities is the ACO.

MERCED COUNTY ANIMAL CONFINEMENT ORDINANCE

The ACO includes regulation of potential health hazards, including numerous requirements for vector control management. These provisions include design and management guidelines for the construction of retention ponds and settling basins to prevent excessive fly or mosquito breeding, and to reduce the potential impact of insects to adjacent residents. In addition, the EIR prepared for the ACO contains mitigation measures to address potential impacts from nuisance flies to be implemented during environmental review of animal confinement facility projects such as the Hillcrest Dairy Expansion project. Mitigation measures adopted in the EIR for the ACO include:

- Measures to be applied on a site-specific basis by the DEH, including Best Management Practices and sanitation practices;
- Measures to control fly populations if nuisance conditions are reported to the DEH, including biological and chemical pest control; and,
- Measures to ensure the remedy of nuisance conditions within a specified period of time.

These mitigation measures as contained in the EIR for the ACO are incorporated as study protocols for this EIR, and serve as the basis for mitigation measures identified in this document.

9.2 ENVIRONMENTAL SETTING

9.2.1 PROJECT SETTING

The existing Hillcrest Dairy is located in unincorporated Merced County, west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area (for additional project area information, see Chapter 3, *Project Description*). The dairy currently has approximately 8,050 animals, including 4,000 milk cows, 750 dry cows, 1,400 bred heifers (15-24 months), 500 heifers (7-14 months), and 1,400 calves (4-6 months). The facility is comprised of a milking parlor, freestall corrals with flush lanes, open corrals with shade structures, silage and commodities storage areas, a solids separation area with four manure separators, three wastewater storage ponds and two settling basins, and a manure stacking pad.

Adjacent existing land uses include several off-site single-family residences associated with other agricultural operations located on parcels to the north, south, east, and west of the project site. Scattered rural residences are located in the general area of the project; most are associated with

agricultural operations. There is one off-site residence located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility) (see Figure 3-4). The closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road, and there are farm labor housing facilities within 0.40 miles and 0.52 miles of the existing dairy (see Figure 3-7 in Chapter 3, *Project Description*). The community of Planada is approximately 0.73 miles south of the Hillcrest Dairy Facility.

NUISANCE FLIES

Nuisance flies are commonly associated with confined animal agriculture facilities such as dairies because they breed in the manure, animal feed, and other organic materials found on these facilities. Nuisance flies are known to cause significant economic losses in the form of reduced milk yields, increased hide damage, and higher production costs due to the nuisance and discomfort they cause to both animals and facility employees. Furthermore, nuisance flies have been shown to carry a large number of disease-causing pathogens such as *Salmonella* bacteria and *Trachoma* virus (bovine pink eye), and may be responsible for infecting animals or people with these pathogens (Gerry 2008).

Some nuisance flies are blood feeders and can inflict a painful bite while feeding on animals or humans. Blood feeding (or biting) flies include the stable fly and horn fly. Other flies do not bite (non-biting flies), instead feeding on body secretions or liquefied organic matter. Non-biting flies include the housefly, face fly, and garbage fly. Common nuisance flies and their characteristics are listed in Table 9-1.

Table 9-1 Common Nuisance Flies			
Species	Primary Breeding Location(s)	Larval Habitat	Primary Season
Housefly (<i>Musca domestica</i>)	Animal confinement facility, residential	Garbage, fresh manure, dry manure, silage	Warm seasons
Face Fly (<i>Musca autumnalis</i>)	Animal confinement facility	Fresh, undisturbed manure	Spring/fall; tend to invade homes in fall
Little Housefly (<i>Fannia canicularis</i>)	Poultry operations	Fresh poultry manure	Spring/fall
Stablefly (<i>Stomoxys calcitrans</i>)	Stables	Wet manure with vegetation (e.g., horse manure)	Mid to late spring
Garbage Flies (<i>Phaenicia</i> , <i>Calliphora</i> , <i>Phormia</i> , and <i>Ophyra</i> spp.)	Residential	Garbage	Warm seasons

Source: Merced County, Revised DEIR for the Animal Confinement Ordinance, 2002.

Different species of nuisance flies are most predominant during different seasons of the year. The length of time required to complete the development from egg to adult is temperature-dependent, and may be as short as seven days during the summer months. Nuisance flies have a life cycle comprised of the following stages: egg, three larval, pupal, and adult. Eggs are laid on wet substrates, especially dung pats and manure or wet/rotting feed, hay, and bedding straw, where the larvae can feed on food particles found on the substrate. A single female can lay hundreds of eggs during her life.

It is important to note that fly larvae are not capable of developing in truly aqueous habitats – they need wet but not overly wet substrates. The third and final (largest) larval stage is called the “wandering stage.” During the wandering stage, fly larvae will leave the wet developmental substrate

to find a dry area where they can pupate (develop into the pupal stage). The pupal case will vary in color from light brown to red to black depending upon the age of the pupa, and superficially will look like a rodent dropping except that it is segmented and well-rounded on both ends. Within the confines of the pupal case, the developing fly will undergo further changes to become a winged adult fly that will eventually emerge from the pupal case and disperse from the site.

Adult flies are generally active during daylight hours and inactive at night. During the day, flies may be noted resting on vertical surfaces such as walls and support structures. Flies will preferentially rest on white (or light colored) surfaces that are in direct sunlight on cold days or in shade on hot days. Most nuisance flies are known to disperse from their development sites into surrounding areas. However, the distance and direction of dispersal are not well understood and are likely determined by many environmental and geographical conditions. Non-biting nuisance fly species are likely to disperse further from the dairy site than those fly species that require animal blood meals. The habitat surrounding a dairy site will likely also play a role in the distance of nuisance fly dispersal. Nuisance flies will likely disperse further in open habitats typical of rangeland and low agricultural crops than they will in urban or forested areas that contain substantially more vertical structure on which flies may rest (Gerry 2008).

At an animal confinement facility, proper design and manure management can significantly decrease fly populations. Because all nuisance flies require wet manure or organic matter (feed, straw, etc.) for development, the number of flies that successfully develop into adults can be reduced by ensuring that these substrates remain dry, or dry very quickly. Fly control at animal confinement facilities includes both housekeeping and pest control measures. Housekeeping measures include manure management, and management of feed and commodity areas. Such management often includes cleanup of spilled feeds and manure at corral edges. Biological controls can include predators of eggs and instars, parasites, and competitors. Operators should avoid the application of pesticides directly to manure because beneficial insects are probably more susceptible than flies, and their loss could result in a fly population explosion. Chemical control can be part of an Integrated Pest Management Program, but should be supplemental to sanitation practices and be used only to control fly outbreaks (Gerry 2008). Several strategies for dairy facility management to decrease breeding success of nuisance flies are contained in Appendix E, *Management of Nuisance Flies: Dairy Design and Operational Considerations*.

MOSQUITOES

Mosquitoes may be associated with animal confinement facilities, especially those that flush manure into wastewater storage lagoons. In addition to transmitting various severe diseases, mosquitoes cause great annoyance and economic loss. Nuisance mosquitoes affect human comfort and efficiency, cause weight loss and death of domestic animals, and reduce milk production (Lawler, S. P. and Lanzaro, G.C 2005).

Mosquitoes are best known for the biting habit of females, which must have a blood meal for egg production. The beak of the male mosquito is dull and unable to penetrate the skin of humans or animals. Their main diet consists of fruit and plant juices.

The five dominant genera of mosquitoes in California are *Aedes*, *Ochlerotatus*, *Anopheles*, *Culex* and *Culiseta*. The *Aedes* and *Ochlerotatus* mosquitoes are also called the “floodwater mosquitoes,” since they usually occur in areas that are subject to intermittent flooding. These areas include irrigated pastures

and orchards, riverbanks, dry lakes, and containers with fluctuating water levels. The first mosquitoes to appear in the early spring are *Culiseta* or “winter mosquitoes.” They are usually found from September through May. The most common genus in the project area is *Culex*. Their larvae occur in almost any water source but prefer foul water, including septic tanks, dairy ponds, industrial wastes, catch basins, street gutters, artificial containers, stagnant pools, and even flower pots (CDPH 2012).

Mosquitoes are insects that have a complete metamorphosis and therefore go through four basic stages to develop to an adult. These stages are: egg; larval; pupal; and adult. The larvae and pupae are the aquatic forms of the mosquitoes. They do not need a lot of water to develop, but cannot breed in areas that are merely damp.

The type of egg varies according to the mosquito genera. *Aedes* and *Ochlerotatus* are so-called floodwater mosquitoes that occur in areas that have a dry and wet period, such as irrigated pastures. They lay their eggs on damp ground that will be flooded later. Therefore, those eggs have to withstand the dry period. The other three genera lay their eggs on the surface of stagnant water, where they hatch within 1-2 days. *Culex* and *Culiseta* mosquitoes lay them in clumps of about 100-200 eggs, the so-called egg rafts, which float on the water. *Anopheles* on the other hand, lay single eggs, which have individual floating devices on the sides of each egg.

The larvae develop in four stages, which are called “instars.” They are active free-swimming forms, which feed on tiny pieces of organic matter. All species except *Anopheles* have breathing tubes to breathe air at the water surface. *Anopheles* mosquitoes have to lay parallel to the water surface to breathe. They usually complete this cycle within 2-5 days, but some species (like *Culiseta* spec.) can overwinter in this stage.

The pupae are also known as “tumblers.” Some people mistake them for tadpoles, since they have a big round head and a tail. As in most insects, the pupae don’t feed at all. They have two air tubes at the top of their head to breathe. The adult mosquito develops inside the pupal case.

After one to two days, the adult mosquito is ready to exit the pupal case. It breaks through the top of the pupae by pumping air into its body and stretching out. Then it sits on the water surface until it’s dry and flies off. Usually, the male mosquitoes are the first ones to hatch. After mating, the female mosquito is ready to take her first blood meal in order to obtain protein for her eggs’ development. The males die shortly after mating, but the females can reproduce several times and live four to eight weeks. Some species overwinter as pregnant females and are able to live for several months at reduced metabolism.

Although some mosquitoes need only five to seven days in hot summer months to complete their life cycle, they are seldom a problem around deep, well-managed wastewater lagoons. To eliminate places where mosquitoes and flies can lay eggs, a holding pond should have weed-free sides and minimal floating solids (CDPH 2012).

Mosquito-borne Diseases

Mosquitoes are very important vectors of serious diseases. Global efforts to reduce the numbers of mosquitoes usually are due to the deadly diseases they can transmit, and not because of the nuisance.

Mosquito-borne diseases under surveillance in California include the endemic arboviral¹ diseases caused by West Nile virus, St. Louis encephalitis virus, and western equine encephalitis virus, as well as travel-associated diseases caused by *Plasmodium* spp. (malaria), dengue, chikungunya, and Zika viruses. The California Department of Public Health, Vector-Borne Disease Section monitors and consults with local agencies regarding invasive mosquito species including *Aedes aegypti* (yellow fever mosquito) and *Aedes albopictus* (Asian tiger mosquito) (CDPH 2022)

The virus that causes encephalitis is normally contained in birds, but horses and humans can become “accidental hosts” if they get bitten by an infected mosquito. Encephalitis is an inflammation of the brain, which results in high fever, irritability, and disorientation, with the most serious cases terminated by coma and death. Most people that are bitten by an infected mosquito never show any symptoms of the disease. In 2020, St. Louis encephalitis virus was detected in mosquitoes in nine California counties, and there were six human cases, including one fatality (CDPH 2020).

The first mosquito carrying West Nile Virus in Merced County was identified in June 2006, with the first human diagnosed with the disease reported in August 2006. Most humans infected with this disease have mild or no obvious symptoms, but 20 percent develop fever and muscular weakness. Less than one percent develops the very serious neuron-invasive form, which causes long term or permanent damage. This disease causes a high mortality among horses and over 225 species of wild birds, and is considered an endemic disease for humans, domestic animals, and wildlife in California (DPH 2012). In 2020, West Nile virus activity was similar to 2019, with 235 human cases reported from 26 California counties, including 11 fatalities. There were 12 reported cases for Merced County (CDPH 2020).

Two genera of mosquitoes are probable transmitters of the West Nile Virus. They are the *Culex* and *Aedes* mosquitoes. One of the *Culex* species, *C. quinquefasciatus*, prefers to breed in waste lagoons such as those commonly found on dairies. For this reason, mosquito control around dairy lagoons is necessary.

Malaria is a widespread disease that still kills hundreds of thousands of people per year – in 2020, an estimated 627,000 people died from malaria, most of them children in Africa. The *Anopheles* mosquito, the vector for malaria, occurs almost everywhere; the reason that there are very few outbreaks of malaria in California is that the Plasmodium parasite is generally not present in the state. In most malaria cases, mosquitoes here transmit the disease by biting someone who was infected by malaria elsewhere in the world. (CDC 2022)

Other forms of mosquito-borne encephalitis that infect birds, livestock, and humans also occur infrequently within the Central Valley region of California.

Two invasive (non-native) mosquito species have recently been found in several California cities and counties, and there is a potential for them to spread into other areas of California. They are *Aedes aegypti* (the yellow fever mosquito) and *Aedes albopictus* (the Asian tiger mosquito). The *Aedes aegypti* has been found in Merced County. Unlike most native mosquito species, *Aedes aegypti* and *Aedes albopictus* bite during the day. Both species are small black mosquitoes with white stripes on their

¹ “Endemic Arboviral disease” is a term used to describe infections regularly found among particular people or in a certain area caused by a group of viruses spread to people by the bite of infected insects (arthropods) such as mosquitoes and ticks.

back and on their legs. They can lay eggs in any small artificial or natural container that holds water. (CDPH 2022)

Aedes aegypti and *Aedes albopictus* have the potential to transmit several viruses, including Zika, dengue, chikungunya, and yellow fever. None of these viruses are currently known to be transmitted within California, but thousands of people are infected with these viruses in other parts of the world. In 2019, there were 41 travel-associated Zika virus infections in California. Reported travel by five infected individuals was to Zika-endemic or outbreak areas including the Caribbean (1), Central America (1), North America (Mexico, 1), and India (1). The exposure region was not available for one infected person. (CDPH 2020)

9.3 ENVIRONMENTAL EFFECTS

9.3.1 SIGNIFICANCE CRITERIA

This analysis evaluates the potential generation and dispersal of nuisance insects at the proposed Hillcrest Dairy Expansion project site. The following significance criterion established by the ACO and its EIR was used to evaluate these impacts:

- Would the project create significant nuisance conditions to the public or the environment through the generation of insects due to project operations?

As set forth in Appendix G to the State CEQA Guidelines, Section IX, *Hazards and Hazardous Materials*, the additional health hazard assessment criteria previously evaluated in the project IS/NOP include whether the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (IX.a)
- 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. (IX.b)
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or wastes within one-quarter mile of an existing or proposed school. (IX.c)
- 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 create a significant hazard to the public or the environment. (IX.d)
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area. (IX.e)
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (IX.f)
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. (IX.g)

These impacts were found to be less than significant in the IS/NOP (see Appendix A). In addition, potential impacts from the release of hazardous substances into the environment during on-site project operations related to routine transport and use of hazardous materials, including pesticides,

diesel fuels, supplements in cattle feed, genetically modified crops, Recombinant Bovine Growth Hormone, and antibiotics were evaluated in the IS/NOP and found to be less than significant. Therefore, these impacts will not be evaluated further in this chapter. For a discussion of impacts to water quality as a result of increased export of dry manure and associated pathogens and residual contaminants, see Chapter 10, *Hydrology and Water Quality*.

9.3.2 ENVIRONMENTAL IMPACTS

Impact HAZ-1: Increased fly production and related nuisance effects (ACO)

Implementation of the proposed Hillcrest Dairy Expansion project could result in the generation of flies that can adversely affect animal and human health, and become a nuisance for other adjacent land uses. While there have been no nuisance fly complaints for the existing dairy facility, because there is a farm labor housing facility within one-half mile of active dairy facilities, there is an increased potential for nuisance conditions, and this would be a potentially significant impact.

Merced County has sought to prevent agricultural nuisances by the use of setbacks between potential sources of nuisance insects and adjoining sensitive land uses. Under existing regulations, Merced County enforces a setback of 1,000 feet between animal confinement facilities (such as ponds, corrals, barns) and rural residences. As discussed in Chapter 11, *Land Use Compatibility*, there are no off-site residences within 1,000 feet of existing dairy facilities; the closest off-site residence is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road. Because the proposed dairy modification would be constructed within the existing dairy footprint, distances to this residence would not be reduced (see Figure 3-7 in Chapter 3, *Project Description*). Also, the proposed expansion would not reduce the distance to less than 1,000 feet for any off-site residence currently greater than 1,000 feet from existing active dairy facilities.

The ACO prohibits new dairies within one-half mile of urban areas, areas zoned for residential uses, or concentrations of rural residences (Merced County Code Chapter 18.64.040 (B)(1)(a)). According to Merced County Code Chapter 18.64.040 (B)(2), if the dairy facility is located within the minimum setback distance, the modification or expansion of an existing facility must not decrease the existing separation distance from these areas. The Hillcrest Dairy facility is situated approximately 0.73 miles north of the urban community of Planada, which would meet ACO setback requirements. There are two farm labor housing facilities located in the vicinity of the Hillcrest Dairy along North Plainsburg Road, which would qualify as a concentration of rural residences. The nearest farm labor housing facility is located approximately 0.40 mile west of active dairy facilities; another farm labor housing facility is located approximately 0.52 miles southwest of active dairy facilities. While some of the residences in the farm labor housing facility are located less than the one-half mile setback specified by the ACO, because the proposed dairy modification would be constructed within the existing dairy footprint, the proposed dairy expansion project would not decrease the distance of active dairy facilities to these residences.

The dairy facility is surrounded by tall field crops (primarily corn double cropped with wheat and sorghum sudan crops), in addition to tree crops (pistachios) located north, east, and south of active dairy facilities. The dairy also has a variety of trees located adjacent to the milk parlor and separating two free stall barns. Trees along Hayden Road are interspersed between the dairy and the pistachio tree crops to the west.

Where trees, tall crops, or man-made structures (e.g., homes) surround an animal facility, the dispersal distance will be short. When low-growing crops or native vegetation surround an animal facility, dispersal distance is typically longer as flies fail to find nearby vertical resting structures or feeding sites to halt the dispersal behavior. The presence of numerous trees in or adjacent to the Hillcrest Dairy, as well as the presence of a tall corn crop during summer, greatly mitigates movement of nuisance flies from the dairy. Flies that begin to disperse are quickly “captured” by the vertical resting structure provided by the corn and trees; from there, the flies are likely to return to the dairy proper rather than dispersing off of the dairy. The presence of pistachio orchards directly north of Planada, and tall field crops to the west between the dairy facility and farm worker housing would continue to minimize the dispersal of flies to these communities.

The operators of the Hillcrest Dairy use a larvicide as a feed additive for fly control at the dairy, in addition to housekeeping measures to address potential fly problems, and would continue to do so with approval of the dairy expansion. According to the dairy operator, the larvicide as a feed additive has been more effective at fly control than traditional pesticide applications that have been used in the past.

The DEH has responsibility for the maintenance of public health in the county. As required by the DEH, the methods for insect control must be described in a Vector Control Plan as outlined in Chapter 18.64.060 C.8.c of the ACO (see Appendix C). A Vector Control Plan has been prepared for the proposed Hillcrest Dairy operations and provided to the County. The Vector Control Plan includes Best Management Practices for Vector Control, specific to field application areas and the dairy production area. The dairy operator would continue to implement the following Best Management Practices to address potential fly problems:

- a. Daily inspection of manure flushing systems to ensure that manure is being effectively removed from flushed areas, with particular attention paid to corners and isolated areas;
- b. Daily inspections of water supply and circulation systems to ensure that any leaks are promptly repaired. These inspections shall include all watering troughs to ensure that mechanisms for controlling water level are operating effectively and are protected from damage;
- c. Regular blading of feeding lanes in freestall barns and corrals to ensure that spilled feed is promptly removed and disposed;
- d. Daily removal of manure and spilled feed from stalls in freestall barns;
- e. Scraping of corrals at least twice a year to minimize the potential for development of fly populations on manure;
- f. Daily inspection of silage storage areas to ensure proper covering, drainage, and removal of any spoiled silage;
- g. Weekly inspection of fence lines of corrals and other “edge” areas, and removal of any accumulated manure;
- h. All exterior doors and windows in milk rooms shall have screens that are inspected monthly to determine if they are working properly, and to identify rips in the screening. Ripped or otherwise damaged screens shall be repaired or replaced immediately.

The following sanitation practices would also continue to be implemented to control fly populations:

- a. Dead animals will be stored in a secured area at the dairy facility, and off-site rendering plant operators will be notified for pickup of carcasses. Carcasses will be removed within 24 hours;
- b. Residual feed will be removed from infrequently used feeding areas;
- c. All garbage will be disposed of in closed dumpsters that are regularly emptied by a contracted waste management service for off-site disposal;
- d. Grass and other landscape clippings will be removed from the site for off-site disposal or reuse (as feed or soil amendment).

Design features of the Hillcrest Dairy that reduce fly development include freestall barns with flush lanes, appropriate grades for drylot pens and the commodities holding area, and placement of watering stations onto concrete aprons adjacent to drainage systems to catch leaks and overflows. The use of manure separators at this facility also results in lower fly numbers as the resulting manure solids are removed and stockpiled in windrows within a few days.

DEH enforces the operational measures of each Vector Control Plan through periodic random inspections, and by requiring the annual submittal of compliance reports. The DEH also responds to complaints from neighbors of such facilities as described above. No current or active fly complaints have been reported and submitted to DEH at the Hillcrest Dairy (Merced County 2022); however, comments submitted on the Notice of Preparation for the project indicated a concern for increased nuisance insects at the Hillcrest Dairy.

As required by the ACO, DEH must implement the following procedures if nuisance insect conditions are reported at, or adjacent to, the animal confinement facility:

- A. If fly nuisance conditions are reported to the Division of Environmental Health, the Division shall take the following actions:

Within 72 hours of receiving a complaint, the Division of Environmental Health shall determine the species and population density of a fly population during an inspection of the location of the complaint, and identify potential sources of flies in the vicinity. At the location of the nuisance complaint, the County will seek to identify access points, identify attractants, and locate breeding sites. If an animal confinement facility is identified as a potential source of the fly nuisance, the County will evaluate the affected herd, identify sources of the fly population, and evaluate weather conditions. In general, an infestation would be indicated by insect pests found on over 25 percent of the animals sampled during monitoring, or by the presence of substantial breeding areas. In the event of infestation causing a nuisance, the County will impose additional control measures on a site-specific basis. Measures that may be required by DEH include both biological and/or chemical pest control methods.

- B. If fly nuisance conditions are confirmed, and are attributable to operations at an animal confinement facility, the Division of Environmental Health shall require the owner/operator to remedy the nuisance condition within a specified period of time. The Division shall notify the parties reporting the nuisance of its findings, and shall provide follow-up inspections to ensure that the nuisance condition is cured. Should the condition persist, the Division shall initiate an enforcement action against the offending operator.

While there is no recent history of nuisance fly complaints at the existing dairy, because some existing residences in the farm labor housing are within the one-half mile setback, there is an increased potential for nuisance conditions, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure HAZ-1:

The applicant has prepared a Vector Control Plan to meet the requirements of the Animal Confinement Ordinance Chapter 18.64.060(C)(8), which has been submitted to the Merced County Division of Environmental Health. The applicant shall continue to implement all measures within the approved Vector Control Plan throughout the active life of the dairy.

Potential Environmental Effects of Measures: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Implementation of the foregoing measures would reduce the magnitude of this potential effect by requiring the continued implementation of housekeeping and management measures. Because the proposed project would not reduce the setback distances specified by the ACO, with implementation of the above mitigation measures, the potential impact from nuisance flies would be reduced to less than significant.

Implementation/Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and Division of Environmental Health shall monitor for compliance. Mitigation Measure HAZ-1 shall be implemented throughout ongoing operations.

Impact HAZ-2: Create significant nuisance conditions due to increased mosquito production (ACO)

Implementation of the proposed Hillcrest Dairy Expansion project would not create significant nuisance conditions related to increased mosquito production since the proposed dairy expansion would not modify existing active dairy facilities that provide potential mosquito habitat. This would be a less-than-significant impact.

Potential habitat for mosquitoes at the Hillcrest Dairy includes the existing on-site waste management system, which consists of two settling basins, three wastewater storage ponds, and sand trap with four mechanical separators. Undesirable numbers of mosquitoes could occur if the new facilities are improperly constructed or managed so that weeds build up along the sides of ponds, mats of solids float within lagoons, or if water levels of “beach areas” of lagoons are not fluctuated to alternately flood or dry out areas where insects lay eggs. Lagoons that become mosquito breeding grounds are those with less than two feet of free bank space (freeboard) from surface to top of levee, that have “dead” corners where little wind action can occur, or where floating solids are not mechanically corralled to one end of the lagoon and removed.

In addition to the Vector Control Plan, which has been completed by the project applicant, Sections 18.64.050 B, H, and X and Sections 18.64.070 B, C, J, K, and S of the ACO contain provisions

related to mosquitoes (see Appendix C). The Merced County Mosquito Abatement District provides guidelines for the construction and management of dairy wastewater systems to prevent significant mosquito production (outlined in Regulatory Framework, above). The proposed project facilities are in compliance with all but one of the provisions of the Mosquito Abatement District and the ACO related to site design to control mosquitoes. One existing settling basin (SSB#1) and the three existing wastewater storage ponds exceed the dimensions outlined in the ACO (Chapter 18.64.070 J) and those recommended by the Mosquito Abatement District. These guidelines state that wastewater holding ponds should not exceed 100 feet in width and settling basins should not exceed 60 feet in width. While the existing wastewater pond and proposed settling basin are located greater than 1,000 feet from any surrounding off-site residence, reducing the potential for nuisance conditions due to mosquitoes from the ponds, the oversized settling basin and storage ponds may incur increased treatment costs for the District.

Substantial compliance with the guidelines of the Merced County Mosquito Abatement District and correct management of the dairy wastewater containment systems are required to comply with the Merced County ACO, and would prevent significant mosquito production. The project Vector Control Plan as required by the ACO contains operational measures for the wastewater ponds and settling basin to further reduce mosquitoes. There have been no recorded complaints regarding mosquitoes from the Hillcrest Dairy. Based on these reasons, the proposed dairy expansion would not increase the potential for mosquito nuisance intensity or frequency. This would be a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure HAZ-2: None required.

10 HYDROLOGY AND WATER QUALITY

This chapter evaluates the potential hydrology and water quality impacts associated with the proposed dairy expansion project, and includes a discussion of the mitigation measures necessary to reduce these impacts to a less-than-significant level, where possible. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), the construction and operation of the Hillcrest Dairy Expansion project may result in degradation of groundwater resources, potential adverse effects to surface water quality, impacts to groundwater levels, alteration of drainage patterns on the site, or conflict with a sustainable groundwater management plan.

This water resources evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the 2030 Merced County General Plan EIR in addition to the EIR for Revisions to the Animal Confinement Ordinance (ACO) and its approval of the ACO.

INTRODUCTION AND METHODOLOGY

Dairies pose a number of potential risks to water quality, primarily related to the amount of manure and wastewater that they generate. Manure and wastewater from animal confinement facilities can contribute pollutants such as nutrients (nitrogen), ammonia, phosphorus, organic matter, sediments, pathogens, hormones, antibiotics, and total dissolved solids (salts). These pollutants, if uncontrolled, can cause several types of water quality impacts, including contamination of drinking water, interference with irrigation systems, and impairment of surface water and groundwater quality.

To determine background characteristics of the groundwater at the project site, information was reviewed from the Merced Groundwater Subbasin Groundwater Sustainability Plan (GSP), California Department of Water Resources (DWR) Sustainable Groundwater Management Act (SGMA) Portal, and water quality data from on-site supply well samples collected as required by the Central Valley Regional Water Quality Regional Water Quality Control Board (CVRWQCB) General Order for Existing Milk Cow Dairies (Order No. R5-2013-0122). Additional information regarding groundwater quality was provided by Consumer Confidence Reports prepared by the Planada Community Services District (PCSD). This hydrogeologic technical evaluation provides an assessment of existing surface water and groundwater conditions, and the potential future impacts associated with operation of the proposed dairy expansion.

10.1 REGULATORY FRAMEWORK

10.1.1 FEDERAL LAWS AND REGULATIONS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Federal, state, and local regulations have been implemented to protect the quality of surface water and groundwater resources. The primary federal laws for protection of water quality are the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA). Federal and state regulations based on this underlying legislation range from establishing maximum contaminant levels to setting anti-degradation policies.

The primary regulatory program for implementing water quality standards is the federal National Pollutant Discharge Elimination System (NPDES) Program. The United States Environmental Protection Agency (EPA) has delegated NPDES enforcement and administration to the State of California. Under the Federal Concentrated Animal Feeding Operations (CAFO) program, owners and operators (“dischargers”) of dairies are required to apply for and receive an NPDES permit if the dairy is a Large CAFO¹ **and** the operator discharges, or proposes to discharge, pollutants to the waters of the United States.

The CVRWQCB administers the federal NPDES program in the Central Valley. The CVRWQCB adopted the General Waste Discharge Requirements and General NPDES Permit for Existing Milk Cow Dairy Concentrated Animal Feeding Operations within the Central Valley Region, Revised Order No. R5-2011-0091, in December 2011. The CAFO Order was written to follow the format of the 2007 General Order for Existing Milk Cow Dairies and Individual Waste Discharge Requirements (discussed under California Laws and Regulations, NPDES Program and the General Order for Existing Milk Cow Dairies and Individual Waste Discharge Requirements below), as closely as possible, while incorporating requirements of the Federal CAFO rule. The CAFO Order serves as a NPDES permit for those existing milk cow dairies that are classified as CAFOs **and** discharge pollutants to water of the United States.

FEDERAL EMERGENCY MANAGEMENT AGENCY

The Federal Emergency Management Agency (FEMA) is the federal agency that oversees floodplains and manages the National Flood Insurance Program (NFIP), adopted under the National Flood Insurance Act of 1968. FEMA’s regulations establish requirements for floodplain management. FEMA prepares Flood Insurance Rate Maps denoting the regulatory floodplain to assist communities such as Merced County with land use and floodplain management decisions in order to meet the requirements of the NFIP.

10.1.2 CALIFORNIA LAWS AND REGULATIONS

California’s primary water law is the Porter-Cologne Water Quality Control Act (Porter Cologne). The regulations that implement Porter Cologne are contained in the California Code of Regulations (CCR). The water quality control programs, plans, and policies that affect the operations of animal confinement facilities include the NPDES program, regional water quality control plans, storm water protection plans, and the Total Maximum Daily Load (TMDL) program.

REGIONAL WATER QUALITY CONTROL PLAN

Individual RWQCBs regulate animal confinement facilities, including dairies and other types of facilities, by developing and enforcing a Basin Plan that identifies beneficial uses of waters in the region, and establishes policies to protect those uses. Agriculture and dairies are designated as beneficial uses of water resources in the Basin Plan.

¹ A large CAFO is defined as having 700 or more mature dairy cattle. Medium and small CAFOs that propose to discharge must also apply for and receive a permit under the NPDES program.

The RWQCB regulates dairies under the provisions of Title 27 of the California Code of Regulations² and the Porter Cologne Water Quality Control Act. The Basin Plan for the Sacramento-San Joaquin Valley (Basin Plan) developed by the CVRWQCB generally regulates agriculture practices.

NPDES PROGRAM AND THE GENERAL ORDER FOR EXISTING MILK COW DAIRIES AND INDIVIDUAL WASTE DISCHARGE REQUIREMENTS

In general, the Waste Discharge Requirements (WDR) Program regulates point discharges that are exempt pursuant to Title 27 of the California Code of Regulations³ and not subject to the Federal Water Pollution Control Act. In California, the permitting authorities for WDRs are the Regional Water Quality Control Boards (RWQCB). The CVRWQCB has jurisdiction over the project site. In May 2007, the CVRWQCB adopted Waste Discharge Requirements General Order R5-2007-0035 for Existing Milk Cow Dairies (2007 General Order). In October 2013, the CVRWQCB adopted changes to the Order through the Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies R5-2013-0122 (General Order), which rescinded and replaced the 2007 General Order. The General Order implements the State laws and regulations relevant to confined animal facilities. The General Order is not a NPDES Permit, and does not authorize discharges of pollutants to surface water that are subject to NPDES permit requirements of the Clean Water Act. The General Order serves as general WDRs for discharges of waste from existing milk cow dairies, and is intended to be compatible with the EPA's regulations for CAFOs discussed above. Under the General Order Waste Discharge Permit Program, Animal Feeding Operations are prohibited from discharging waste into surface water or into groundwater that is directly connected to surface water.

The General Order only applies to owners and operators of existing milk cow dairies (dischargers) in the Central Valley Region. For the purposes of the General Order, existing milk cow dairies are those that were operating as of October 17, 2005 for which a Report of Waste Discharge (ROWD) was filed with the CVRWQCB. Dairies that did not file a 2005 ROWD, new dairies, and existing dairies expanding the mature cow number established under the 2005 ROWD by greater than 15 percent are not covered under the General Order, and are required to obtain coverage under Individual WDRs. All dairies covered under the General Order are required to:

- Comply with all provisions of the General Order,
- Submit a Waste Management Plan (WMP) for the production area,
- Develop and implement a Nutrient Management Plan (NMP) for all land application areas,
- Monitor wastewater, soil, crops, manure, surface water discharges, and storm water discharges,
- Monitor surface water and groundwater,
- Keep records for the production and land application areas, and
- Submit annual monitoring reports.

The NMP and WMP describe the regulatory requirements for the facility, and together they serve as the primary tool to prevent groundwater contamination and poor operations. The General Order establishes a schedule for dischargers to develop and implement their WMP and NMP, and requires them to make facility modifications as necessary to protect surface water, improve storage capacity,

² Article 1, Subchapter 2, Chapter 7, Division 2, Title 27 of the California Code of Regulations.

³ Subsection 20090 of Article 1, Subchapter 2, Chapter 7, Division 2, Title 27 of the California Code of Regulations.

and improve the facility's nitrogen balance before all infrastructure changes are completed. In addition, Best Management Practices (BMP) intended to minimize surface water discharges and subsurface discharges at dairies are required. The General Order also requires each dairy to have fully implemented a WMP and an NMP. In compliance with the requirements of the CVRWQCB, the proponents of the Hillcrest Dairy have completed the required components of the WMP and NMP of the General Order.

The 2007 General Order included a provision that required compliance with Monitoring and Reporting Program No. R5-2007-0035. The Reissued Dairy General Order requires compliance with the Monitoring and Reporting Program (MRP) R5-2013-0122. Under the revised MRP, and based on an evaluation of the threat to water quality at each dairy, the CVRWQCB may require the installation of monitoring wells to comply with the General Order MRP. The 2013 Monitoring and Reporting Program requires:

- Periodic inspections of the production area and land application areas,
- Monitoring of manure, process wastewater, crops, and soil,
- Recording of operation and maintenance activities,
- Groundwater monitoring,
- Storm water monitoring,
- Monitoring of surface water and discharges to surface water,
- Annual reporting,
- Annual reporting of groundwater monitoring,
- Annual storm water reporting,
- Noncompliance reporting, and
- Discharge reporting.

The General Order and Individual WDRs also established the ability for individual dairies to participate in a Groundwater Representative Monitoring Program (RMP) as an alternative to an individual requirement for groundwater monitoring. Each dairy must notify the CVRWQCB about its decision to join an RMP. Dairies that do not notify the CVRWQCB or do not intend to join a RMP will be held to individual monitoring requirements set forth in the regulations. While the Hillcrest Dairy has previously used individual groundwater monitoring wells, because three of the six monitoring wells have insufficient water for sampling, the Hillcrest Dairy joined the Central Valley Dairy Representative Monitoring Program (CVDRMP) in 2019.

The RMP establishes a regional monitoring network for the member dairies of the CVDRMP. The RMP has been developed in accordance with General Order requirements and with review by the CVRWQCB. The regional monitoring network is established by installing individual monitoring well networks at dairies with hydrogeologic and land use characteristics typical of the area. Groundwater monitoring results for these dairies are then extrapolated to other member dairies of the RMP, theoretically precluding the need to install monitoring well networks on an individual basis.

There are over 1,100 dairy members of the CVDRMP. Monitoring data are being collected at 42 representative dairies, using 443 monitoring wells. The findings from 2012 through 2019⁴ confirm that first encountered groundwater has been affected by historic and current dairy farming practices, and indicate that crop fields are the primary source of nutrient emissions to groundwater⁵. (CVDRMP 2019)

Based on current knowledge collected to date, the RMP findings indicate that most dairies will not be able to meet CVRWQCB standards for being protective of groundwater. The CVDRMP recommends several specific changes to the Dairy General Order, including replacing the current annual reporting method with a more consistent approach focused on achieving whole-farm balance. CVDRMP also recommends new methods for sampling liquid and solid manure and harvested crops, use of flowmeters for measuring applications of liquid manure, use of enhanced Irrigation and Nitrogen Management Plans (INMP), new lagoon liner standards and a requirement for dairy operator education in the area of improving nitrogen use efficiency (NUE). CVDRMP also recommends continued groundwater monitoring to watch trends over time, but at reduced frequency. (CVDRMP 2019)

In accordance with Provision 29 of the General Order, all dairies must be in compliance with Title 27. As explained in the General Order Information Sheet, the Title 27 design standards for ponds have been determined to not be protective of groundwater quality, and there are technologies available that can provide greater groundwater protection. Because Section 13360 of the California Water Code requires that WDRs not specify the design, location, type of construction, or particular manner in which compliance may be had with the requirements, the General Order cannot specify any particular pond design. However, the General Order establishes performance standards for new wastewater ponds that are more stringent than Title 27 in order to provide increased groundwater protection.

The Hillcrest Dairy is regulated under the Reissued Dairy General Order (R5-2013-0122). As established by the ROWD submitted for the existing dairy to the CVRWQCB in October 2005, the State-permitted herd size for the dairy is 4,750 milk and dry cows combined⁶, with regulatory review required for expansions of greater than 15 percent above this value (5,463 milk and dry cows combined). Since the proposed expansion would increase the mature cow number established under the WDR by greater than 15 percent, the proposed expansion would require a new individual WDR. Significant operational and reporting requirements will be required as part of the individual WDR process, including the following nutrient management practices:

- Discharge reporting,
- Groundwater monitoring,
- Wastewater sampling and application monitoring,

⁴ Program updates accessed on March 7, 2022, available at: http://www.waterboards.ca.gov/centralvalley/water_issues/confined_animal_facilities/groundwater_monitoring/index.shtml

⁵ The RMP examines conditions in first encountered groundwater (i.e., groundwater near the water table directly beneath dairy facilities). Therefore, the design of the dedicated monitoring wells is fundamentally different from that of drinking water wells, and data from the monitoring wells are not indicative of actual impacts to drinking water sources. The RMP was not designed for, and does not address, monitoring and assessment of drinking water sources.

⁶ The CVRWQCB regulates only mature cows (milk and dry) and does not establish any limits on calves, heifers, and other support stock.

- Irrigation application monitoring,
- Facility and land application visual inspections,
- Crop nitrogen/phosphorus uptake monitoring, and
- Field specific nutrient budgeting.

Planning documents related to these requirements include a Nutrient Management Plan and Waste Management Plan (see Appendix H, *Dairy Facility Nutrient Management Plan Report and Waste Management Plan Report for the Hillcrest Dairy*).

Nutrient Management Plan and Waste Management Plan

The NMP/WMP planning process is used to implement BMPs for dairies. The NMP/WMP are planning documents used to describe facility operations, develop wastewater disposal options, and outline mitigation measures for each dairy. These documents are required to be revised as appropriate for the operation. Specific elements related to the number and type of animals dictate the size of a facility, fresh/flush water needs, and wastewater generation. Nitrogen and salt balance calculations based on the herd description, housing requirements (i.e., flush freestalls or dry lots), acreage available for land application, and crop nutrient removal rates are made to determine the nitrogen and salt uptake for the proposed cropping pattern. On-site wastewater plans, storage elements, and storm water planning may be modified based on the calculations contained in the NMP/WMP.

As mandated by the ACO, an NMP/WMP in place of a Comprehensive Nutrient Management Plan (CNMP)⁷ for the Hillcrest Dairy Expansion facility has been prepared pursuant to the requirements of the CVRWQCB (see Appendix H). The NMP and WMP for the proposed dairy expansion, both dated August 2020, have been used for the evaluation in this DEIR. To establish a baseline, the NMP and WMP (both dated October 2019) were used to represent existing conditions.

CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING PROGRAM AND SUSTAINABLE GROUNDWATER MANAGEMENT ACT

Since 2009, the California Statewide Groundwater Elevation Monitoring Program (CASGEM) has tracked seasonal and long-term groundwater elevation trends in groundwater basins statewide. The CASGEM is a voluntary program run by DWR wherein local monitoring entities collect groundwater elevation data and provide it to DWR. In June 2014, the DWR announced its CASGEM Basin Prioritization results. The Basin Prioritization determined groundwater use, groundwater supply, groundwater overdraft, and other factors for each basin to assign priority for action. Medium and high priority basins are those identified with medium or high risk for overdraft or adverse groundwater impacts. These at-risk groundwater basins would be first to receive state funds for drought management and other groundwater funding programs.

The Sustainable Groundwater Management Act (SGMA) of 2014 (as amended) allows GSPs to be prepared by groundwater sustainability agencies (GSA) to manage groundwater resources while being sensitive to local economic and environmental needs. SGMA requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability

⁷ Since adoption of the ACO, the CVRWQCB has required the preparation of a NMP and WMP, which serve in place of the CNMP as allowed by Merced County Code Chapter 18.64.060 K.

within 20 years of implementing their sustainability plans. For critically over-drafted basins, the target year will be 2040. For the remaining high and medium priority basins, 2042 is the deadline.

The Merced Groundwater Subbasin (the area of the Hillcrest Dairy) has been designated as critically overdrafted; it is identified as a high priority groundwater basin. Water management and land management agencies in the Merced Subbasin have formed three GSAs: the Merced Irrigation-Urban Groundwater Sustainability Agency (MIUGSA), the Merced Subbasin Groundwater Sustainability Agency, and the Turner Island Water District Groundwater Sustainability Agency. The Hillcrest Dairy location is included in the jurisdiction of both the MIUGSA and the Merced Subbasin GSA, both of which were formed in 2017. These GSAs worked to develop a joint Merced Groundwater Subbasin Groundwater Sustainability Plan, which was adopted in November 2019. The GSP was submitted to the California Department of Water Resources by the January 31, 2020 deadline. However, the DWR found that the Merced Subbasin GSP does not satisfy the objectives of the SGMA nor substantially comply with the GSP Regulations. The Subbasin's GSAs have 180 days, the maximum allowed by GSP Regulations, to address the identified deficiencies, or no later than July 27, 2022. If the revisions address the identified deficiencies, the DWR will determine that the GSP is approved. After adoption of the GSP, an annual report to DWR is required by each April 1 to provide information on groundwater conditions and an update on implementation efforts for the prior year.

Until the GSP is approved and implemented, the Merced County Groundwater Ordinance regulates water management in the county.

IRRIGATED LANDS REGULATORY PROGRAM

A range of pollutants such as pesticides, fertilizers, salts, pathogens, and sediment can be found in runoff from irrigated lands. The Irrigated Lands Regulatory Program (ILRP) of the CVRWQCB regulates discharges from irrigated agricultural lands throughout the Central Valley. Its purpose is to prevent agricultural discharges from impairing the surface waters that receive the discharges. To protect these waters, RWQCBs have issued conditional waivers of WDRs to growers that contain conditions requiring water quality monitoring of receiving waters, and corrective actions when impairments are found. The Long-term Irrigated Lands Regulatory Program General Orders adopted by the RWQCB protect both surface water and groundwater throughout the Central Valley. (CVRWQCB 2022)

In implementing the ILRP, the CVRWQCB has allowed growers to combine resources by forming water quality coalitions. The coalition groups work directly with their member growers to assist in complying with CVRWQCB requirements by conducting surface water monitoring, and by preparing regional plans to address water quality problems. All Central Valley growers must comply with the ILRP. If growers do not obtain regulatory coverage with payment of a membership fee for their waste discharges as a part of a Coalition Group, they must file a ROWD and filing fee with the CVRWQCB to obtain a grower-specific permit. The Conditional Waiver requires that coalition groups comply with General Order WDRs, implement Monitoring and Reporting Program plans, and submit periodic monitoring reports and monitoring data. When there have been two or more exceedances of the same pollutant at the same site within a three-year period, Management Plans must be prepared and implemented.

There is significant overlap between the ILRP and the Dairy Programs with regard to regulatory requirements, monitoring, and best management practices. Because onsite application of nutrient rich wastewater at a dairy is regulated by the CVRWQCB through the Dairy General Order, the Hillcrest Dairy is not anticipated or likely to be regulated under the ILRP program. If site conditions change (i.e., the Dairy Program regulations no longer apply, or if project area cropland is not included in the dairy's NMP) and a regulatory assessment warrants action under the ILRP, the Hillcrest Dairy could potentially participate in the East San Joaquin Water Quality Coalition by paying a membership fee. This Coalition represents all member dischargers as the monitoring and reporting entity for the Coalition-specific Waste Discharge Requirements / Monitoring and Reporting Program.

CENTRAL VALLEY SALINITY ALTERNATIVES FOR LONG TERM SUSTAINABILITY AND NITRATE CONTROL PROGRAM

Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) is a collaborative stakeholder driven and management effort to develop sustainable salinity and nitrate management planning. The long-term solutions for managing salt in the Central Valley will be developed and implemented through a phased Salt Control Program. The three phases of the Salt Control Program include: (1) Complete a comprehensive study and analysis to define long-term salt management actions, to begin in 2021 over 10 to 15 years; (2) Complete design and permitting of projects identified in Phase 1; and (3) Construct projects to manage salts. The CVDRMP is paying the fee for participation in the CV-SALTS Salt Control Program on behalf of its members.

Nitrate Control Plan (NCP) collaboratives were developed in Merced County within the 2020 Priority 1 subbasins (Turlock and Chowchilla). The collaboratives were charged with developing and implementing action plans to provide safe drinking water, reducing nitrate impacts, and restoring groundwater quality. The Merced Subbasin, the area of the Hillcrest Dairy, will be required to comply with the Nitrate Control Program regulations between late 2022 and late 2024.

FEED SUPPLEMENTATION

As evaluated in the EIR for the Merced County ACO (Merced County 2002), approximately 90 to 95 percent of dairies in Merced County use feed additives for selenium (and other trace metals) because feed in Merced County is lacking in selenium. The form of selenium added to the feed is sodium selenate, at concentrations of up to 0.3 parts per million (as a daily dose not to exceed, the maximum allowed by the U.S. Food and Drug Administration). Confined animal waste (i.e., manure and urine) is stored on site and then may be used as fertilizer. Selenium present in dairy waste may enter the environment through the following routes (exposure pathways): direct application to soil, storage in ponds/retention basins, leaching from soil and/or pond sediment to groundwater and subsequent transport to surface water, dust generation, and limited surface water runoff (surface water is required to be contained on-site, but may run off during extreme storm events). Leaching from soil and/or pond sediment to groundwater and subsequent transport to surface water, direct discharge of tailwater, and discharges from tile drains to surface water would also be complete exposure pathways. For additional discussion of selenium, see the ACO RDEIR, pages 5-141 through 5-145. For information on how to access the ACO RDEIR, see Chapter 1, *Introduction*, of this EIR.

TOTAL MAXIMUM DAILY LOAD PROGRAM – IMPAIRED WATERWAYS

Under Section 303(d) of the CWA, states are required to identify and list water bodies that do not meet applicable water quality standards. Such water bodies receive a ranking for the establishment of Total Maximum Daily Load⁸ for all listed water contaminants that do not meet water quality standards. States are required to establish a TMDL for these identified water bodies that will lead to achieving the applicable water quality standards, and to allocate the TMDL among all contributing sources. The assessment of sources may indicate that a water body is impaired because of nutrient or pathogen problems attributable to animal manure or wastewater, or because a watershed has more manure generated than there is land available for application. The TMDLs will be implemented through NPDES permits, nonpoint source control programs, and other local and state requirements.

The CVRWQCB maintains and periodically updates the impaired water bodies list for Central Valley. There are two streams in the project vicinity listed as impaired under §303(d). Bear Creek is located approximately one mile north of the dairy. The affected 75-mile segment runs from Bear Valley in Mariposa County to the San Joaquin River. Identified pollutants of concern include indicator bacteria and toxicity. A second stream in the project vicinity, Miles Creek, is located 0.9 miles southeast of active areas of the Hillcrest Dairy. The affected length of this stream is 13 miles. Identified pollutants of concern in Miles Creek include indicator bacteria, dissolved oxygen, and toxicity. The project site is located near the Bear Creek and Miles Creek impaired water bodies; however, as described in the NMP and WMP, land application field discharges are closely monitored to address potential impacts.

CONSTRUCTION GENERAL PERMIT

Construction activities disturbing one or more acres are required by the State Water Resources Control Board (SWRCB) to obtain a Construction General Permit (Order 2009-0009-DWQ). This Construction General Permit provides a risk-based approach to managing storm water discharge. The Construction General Permit has three risk level categories based on sedimentation risk and receiving water risk. Each risk category has specific BMPs that must be implemented with specific monitoring, sampling, and reporting requirements. The Construction General Permit also sets specific numeric action levels (NAL) for pH and turbidity.

The Construction General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) and a Rain Event Action Plan (REAP) to be developed by the discharger, who must implement these plans – and also comply with specific requirements of the Construction General Permit. The SWPPP must list any BMPs that the discharger will use to protect storm water runoff, and define the placement of identified BMPs. Additionally, the SWPPP must contain: a visual monitoring program; a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan.

⁸ A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

10.1.3 MERCED COUNTY

MERCED COUNTY GENERAL PLAN

The Water Element of the Merced County General Plan contains goals and policies pertaining to protection of water resources in Merced County. Those policies that are relevant to the project site are presented below:

Policy W-2.4: Agricultural and Urban Practices to Minimize Water Contamination

Encourage agriculture and urban practices to comply with the requirements of the Regional Water Quality Control Board for irrigated lands and confined animal facilities, which mandate agricultural practices that minimize erosion and the generation of contaminated runoff to ground or surface waters by providing assistance and incentives.

Policy W-2.5: Septic Tank Regulation

Enforce septic tank and onsite system regulations of the Regional Water Quality Control Board to protect the water quality of surface water bodies and groundwater quality.

Policy W-2.6: Wellhead Protection Program

Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.

Policy W-3.13: Agricultural Water Reuse

Promote and facilitate using reclaimed wastewater for agricultural irrigation, in accordance with Title 22 and guidelines published by the State Department of Public Health.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these goals and policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

ANIMAL CONFINEMENT ORDINANCE

The Merced County Animal Confinement Ordinance regulates the design, construction, and operation of animal confinement facilities within the county. Because the ACO is regulatory rather than permissive, all existing and proposed animal confinement facilities within the county are required to comply with the terms of the ACO, including the proposed Hillcrest Dairy Expansion project. The Merced County ACO is included as a section of Title 18, Zoning, of the Merced County Code.

Merced County regulations under the ACO maintain water quality standards that are consistent with the CVRWQCB Basin Plan. The Merced County ACO addresses potential impacts to water quality primarily through preparation and implementation of a CNMP. If a site-specific CNMP is followed and if best management practices are used, nitrogen loading and salt loading to groundwater will be minimized. Since adoption of the ACO, the CVRWQCB has required the preparation of a NMP and WMP as described above, which would serve in place of the CNMP as allowed by County Code Chapter 18.64.060 K.

The Merced County ACO contains additional provisions to protect water quality. For example, Chapters 18.64.050 E and I of the ACO require that all wastewater or storm water that has come into contact with manure be maintained on the project site, or applied to other sites only upon

written approval of the landowner. Chapter 18.64.050 J requires that off-site property owners accepting wastewater (liquid manure) complete written agreements to accept responsibility for proper land application. Chapter 18.64.050 G requires notification of Merced County Division of Environmental Health (DEH) for any off-site discharge of wastewater. Chapter 18.64.050 BB requires application of manure at agronomic rates. For the permanent closure of an animal confinement facility, Chapter 18.64.050 R requires DEH to review and approve specific collection of soil samples from underneath existing ponds to be abandoned after liquid and solids have been removed. Chapter 18.64.070 contains guidelines for new or modified retention ponds and settling basins. Permits must be obtained from DEH prior to construction and an inspection must be performed prior to use of a newly constructed pond or basin. Portions of the ACO that specifically apply to protection of water quality include: Chapters 18.64.050 D, E, F, G, H, J, K, M, N, O, P, Q, R, T, V, Z, AA, BB, CC, DD, EE, II, JJ, KK, LL, MM, NN, QQ; 18.64.060 A, B, C, D, E, F, H, K; and 18.64.070 A, D, E, G, H, I, K, L, M, P, Q, S, and T (see Appendix C for the full text of the ACO). To ensure compliance with the provisions of the ACO, the Ordinance requires routine inspections of animal confinement facilities by Merced County DEH.

To address potential impacts to water resources, the EIR prepared for the ACO contains mitigation measures to be implemented during environmental review of animal confinement facility projects such as the proposed project. Mitigation measures adopted as policy in the EIR for the ACO include:

- Measures to reduce groundwater contamination; and,
- Measures to reduce the risk of contamination of surface waters during flood events.

These mitigation measures as contained in the EIR for the ACO are incorporated as study protocols for this EIR and serve as the basis for mitigation measures identified in this document.

FLOOD ORDINANCE

Merced County is responsible for implementing FEMA floodplain management regulations. Zoning Code Section 18.26.050, *Provisions for Flood Hazard Reduction* (Flood Ordinance) contains specific requirements limiting and discouraging development in various flood zones, as designated on Flood Insurance Rate Maps. The County's Flood Ordinance defines areas of special flood hazard as Zones A, AO, AE, or AH. For areas in a special flood hazard zone, no development may occur on the site until all of the relevant requirements of the Flood Ordinance have been satisfied. These Flood Ordinance requirements include construction standards for both occupied and non-occupied structures, utilities, mobile homes, and for non-residential structures. These standards include anchoring structures to prevent flotation, collapse or movement, raising structures above the base flood elevation or otherwise flood-proofing them, constructing adequate drainage paths around structures to guide floodwaters around and away from proposed structures, providing a determination of the base flood elevation as determined by a licensed engineer, and drafting all subdivision plans so that they identify the flood hazard area and elevation of the base flood, and provide the elevation of proposed structures and pads.

MERCED COUNTY WELL ORDINANCE

The Merced County Code Chapter 9.28, *Wells* contains Water Well Standards (Chapter 9.28.060) that would minimize the potential for contaminated water to enter a well and contaminate groundwater. The standards include well setback distances from potential sources of contamination and pollution, and standards for construction.

MERCED COUNTY GROUNDWATER ORDINANCE

With the adoption of the Sustainable Groundwater Management Act of 2014, Merced County adopted groundwater ordinance No. 1930 (adding Chapter 9.27 to the Merced County Code), that prohibits the unsustainable extraction of groundwater or conveyance of groundwater outside of a subbasin. This ordinance is a transition document until documents required by the SGMA are published and implemented. Two prohibitions were set in place as part of the ordinance. The first prohibits the construction of new wells within unincorporated areas of the county showing excess extraction patterns from 1995 through 2013. The second prohibits the export of groundwater from Merced County to areas outside of the groundwater basin where it originated. Multiple exemptions are in place to allow water districts and water agencies to continue to operate.

On February 8, 2022, the Board of Supervisors adopted amendments to the Groundwater Ordinance that would transition the determination of sustainability of proposed groundwater wells from the County to the GSAs. Under the revised Ordinance, the following criteria must be met for any proposed wells to be approved:

- (1) The proposed well must be located in an area covered by an adopted and implemented GSP;
- (2) The proposed well is not located in a probationary basin as designated by the State Resources Water Control Board;
- (3) The proposed construction and use of the proposed well are consistent with the applicable GSP;
- (4) The GSA provides documentation of its determination that all of the above conditions are met to the Merced County DEH.

The GSP consistency determination must be provided with the well application to the County, and provided all conditions are met, a well construction permit could be issued ministerially. These amendments become effective May 1, 2022, and any well applications received after that date would be subject to GSA consideration.

ONSITE WASTEWATER TREATMENT SYSTEMS

In June 2012, the SWRCB adopted a Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS). The policy establishes a set of comprehensive regulations for all aspects of siting, construction, and operating OWTS. The Merced County DEH enforces design standards for the operation and maintenance of on-site sewage disposal systems to minimize potential pollution of groundwater and surface water features (Merced County Code Chapter 9.54, *Regulation of Onsite Wastewater Treatment Systems*).

REGULATORY COMPLIANCE AUDIT

The Merced County Community and Economic Development Department requests regulatory compliance audits of expanding dairies from the Division of Environmental Health as part of the Conditional Use Permit (CUP) evaluation process prior to project approval.

The DEH staff performed an inspection and audit of the Hillcrest Dairy on April 23, 2021. The dairy inspection evaluated the facility for compliance with the Merced County Animal Confinement Ordinance (ACO) (Merced County Code Chapter 18.64). The DEH staff reviewed and approved the proposed WMP and NMP, revisions completed and signed on August 4, 2020. The DEH found the facility in compliance with the ACO as referenced in their letter of May 25, 2021.

MERCED COUNTY REGULATION OF STORM WATER DISCHARGE DURING CONSTRUCTION

Merced County Code regulates storm water discharges related to construction activities through Chapter 9.53 of the County Code. As defined by the Code, construction means “Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.” Standards required by the County include:

Prior to disturbing any soil, operators of a construction activity project shall prepare and submit a Sediment Control Plan (SCP) to the Department of Public Works for review and approval. The SCP shall be incorporated as separate sheets of the Civil portion of the plans prepared for the project and shall indicate BMPs to be used during project construction and post construction. The SCP shall be prepared by a certified Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer.

The operator of a construction activity project shall submit evidence that all applicable permits (i.e. State Water Board's Construction General Permit, State Water Board 401 Water Quality Certification, U.S. Army Corps 404 permit, and the California Department of Fish & Wildlife 1600 Agreement) directly associated with the soil disturbing activities have been obtained.

If a SWPPP is required to be developed for the construction activity project pursuant to the State Water Board's Construction General Permit, the SWPPP may substitute for the required SCP. In this case, the operator of the construction activity project shall submit a copy of the SWPPP to the County for review and approval.

10.2 ENVIRONMENTAL SETTING

10.2.1 PROJECT SETTING AND PHYSICAL GEOGRAPHY

The project site is located in the San Joaquin Valley in an active agricultural district of eastern Merced County. The topography of the site is nearly flat with surface elevations ranging from 120 to 130 feet above mean sea level at the dairy facility and application areas. Bear Creek, a tributary to the San Joaquin River, is located approximately one mile north of project site active dairy facilities. Bear Creek enters the San Joaquin River after flowing several miles west through the City of Merced. Miles Creek is located approximately one mile south of active dairy facilities and just east of Planada.

The on-site waste management system consists of two settling basins, three wastewater storage ponds, and a sand trap with four mechanical separators. Irrigation water for the project farming operations is supplied by surface water sources from Merced Irrigation District (MID) canals, MID groundwater wells, and seven (7) irrigation wells. Three domestic groundwater wells are used for residential and dairy purposes. Flood irrigation methods are used to distribute fresh irrigation water and wastewater (manure) mix to cropped fields. Land application fields receiving manure wastewater have been graded and developed with tailwater return systems, and collected tailwater is recycled and returned to the top of field, returned to a tailwater pond for reuse, or drained through an adjacent field to the tailwater pond. For a depiction of the dairy facility with existing and proposed structures and the application area irrigation wells, see Figures 3-5, 3-6a, and 3-6b, in Chapter 3, *Project Description*, of this EIR.

10.2.2 GEOLOGY

REGIONAL GEOLOGY

The Central Valley is composed primarily of alluvial deposits from erosion of the Sierra Nevada located to the east and the Coastal Ranges located to the west. In addition to the alluvial deposits that comprise the majority of the geology within the Central Valley, lacustrine⁹ and marsh deposits also exist. Lacustrine deposits are composed of fine-grained material (clay and silt interbedded with sands and conglomerates) and were formed during a time when lakes and marshes existed within the Valley. Geologic units located east of the San Joaquin River (the location of the Hillcrest Dairy Expansion project) consist of high amounts of silica-rich intermixed clay, silt, sand and gravel deposits derived from the granitic Sierra Nevada Mountains.

As set forth in the Merced Groundwater Subbasin GSP, land subsidence is not a significant issue in the area of the project site.

SITE SPECIFIC SOILS AND GEOLOGY

Predominant soils in the area of the proposed Hillcrest Dairy Expansion as classified by the Natural Resources Conservation Service (NRCS) consist of loams and clays. Predominant soils are Porterville clay, Raynor cobbly clay, and Yokohl loam. Near surface geology at the project site consists of Quaternary alluvium of the Riverbank Formation.

The on-site monitoring well log data¹⁰ indicate that surface geologic materials consist of interbedded silt, sand, and clay layers with minor gravel lenses of the Riverbank Formation. Sand layers range in thickness from approximately 4 to 45 feet. Silt and clay layers range in thickness from less than 5 to 30 feet. Major clay layers greater than 20 feet in thickness appear, but are relatively shallow (within 50 feet of the surface) and are not continuous. These clays are associated with the Corcoran Clay unit in the area.

10.2.3 HYDROGEOLOGY

REGIONAL HYDROGEOLOGY

Regional groundwater in Merced County is composed of four subbasins of the San Joaquin Hydrologic Region: the Turlock, the Merced, the Chowchilla, and the Delta-Mendota. The project site lies within the Merced Subbasin, bounded on the north and south by the Turlock and the Chowchilla subbasins. Each of the subbasins is split into the following three different water bodies depending upon depth and geology: an unconfined aquifer, a semi-confined aquifer, and a confined aquifer. Differentiation between the unconfined, semi-confined, and confined aquifers is due to existence of Corcoran Clay within the Tulare Formation. Groundwater is unconfined or perched above the Corcoran Clay and semi-confined to confined below the Corcoran Clay. The project site is east of the primary extent of the Corcoran Clay, or may be underlain by it at a depth less than 50 feet (DWR 1981).

⁹ Lacustrine means “of a lake” or “relating to a lake.”

¹⁰ Environmental Assessment Services July 30, 2002 Monitoring Well Installation Report.

Data from the GSP indicates that from the monitoring period 1995-2015, groundwater elevations in the subbasin have declined over time (GSP 2019). Depressed groundwater levels and area dewatering have resulted in groundwater flow direction changes and water wells going dry throughout the subbasin.

SITE SPECIFIC HYDROGEOLOGY

The Hillcrest Dairy project site lies near the eastern edge of the Merced subbasin. Groundwater flow in the Merced Subbasin within the project vicinity is generally to the west and southwest, towards the San Joaquin River. In general, groundwater depths are shallowest near the San Joaquin River, and increase away from the river as surface elevation increases.

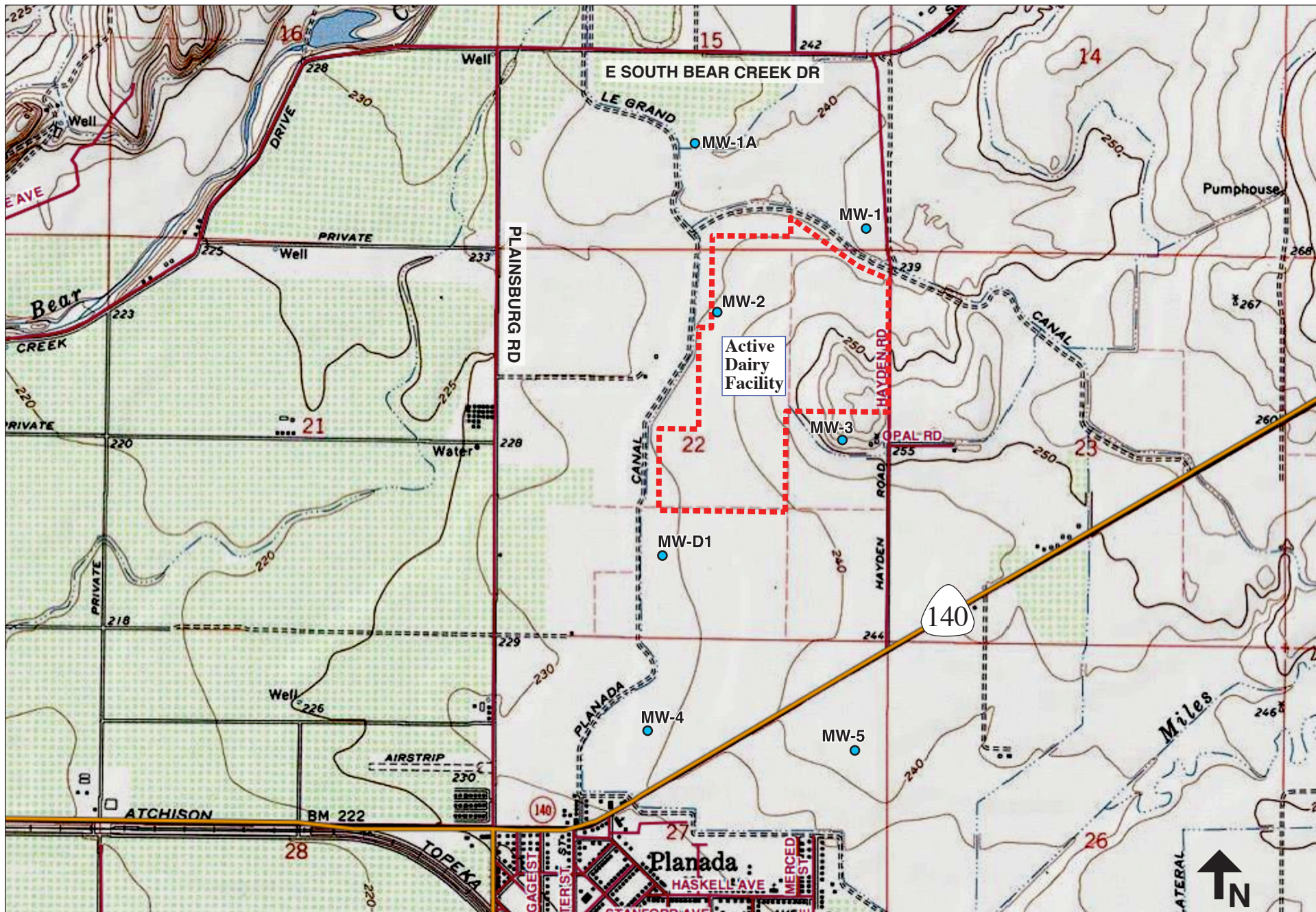
Based on the GSP, data from 25 wells in the greater area of the project site indicated that the average groundwater level decline was 1.2 feet/year from 1996-2015, though it is possible some portion of additional decline during the 2012-2015 drought is missing from this data (GSP 2019). DWR 20-year groundwater level trends for several wells southwest of Planada for groundwater measurements from 2004-2021 indicate an even larger decreasing trend of 2.5 feet/year (DWR 2021).

Six monitoring wells (MW) were established on and around the Hillcrest Dairy site in May of 2002 (ESA 2002) (see Figure 10-1 for monitoring well locations). At the time, the observed groundwater was between 12 and 44 feet below ground surface (bgs), with groundwater elevations ranging from 212 to 235 feet above mean sea level. Groundwater monitoring data from 2005 to 2007 indicated groundwater flow direction at the site to be generally to the southwest with a component flowing from northwest to southeast. As noted in the GSP, this general area of the aquifer region appears to have localized highs and depressions without a dominant lateral gradient, possibly due to pumping or stream influences (GSP 2019).

Local groundwater trends over the 2016-2018 monitoring period demonstrate generally consistent upward trends, though groundwater levels within a few individual wells experienced a range of up to 20 feet of variation. During the 2018 sampling period, the observed groundwater from on-site monitoring wells was between approximately 18 and 48 feet bgs, with groundwater elevations ranging from approximately 200 to 231 above mean sea level. Figure 10-2 indicates that four monitoring wells (MW-1, MW-1A, MW-4, and MW-5) showed gradual upward trends in groundwater levels from 2016 to 2018¹¹. The upward trend in four (4) of the six (6) wells coincides with the upward trend in rainfall and snowpack in the San Joaquin Valley and Sierra Nevada, respectively, during the 2016-2018 time frame (Sousa Engineering 2018).

Project area groundwater beneficial use is for domestic and irrigation purposes. Land use in the surrounding area is mainly agriculture, with the nearby urban community of Planada. Three domestic wells and seven irrigation wells exist on-site and are used presently for dairy operations and irrigation of surrounding cropland. Similar to existing conditions, the proposed project would continue to use both surface water from the Merced Irrigation District canals and groundwater for irrigation at the dairy.

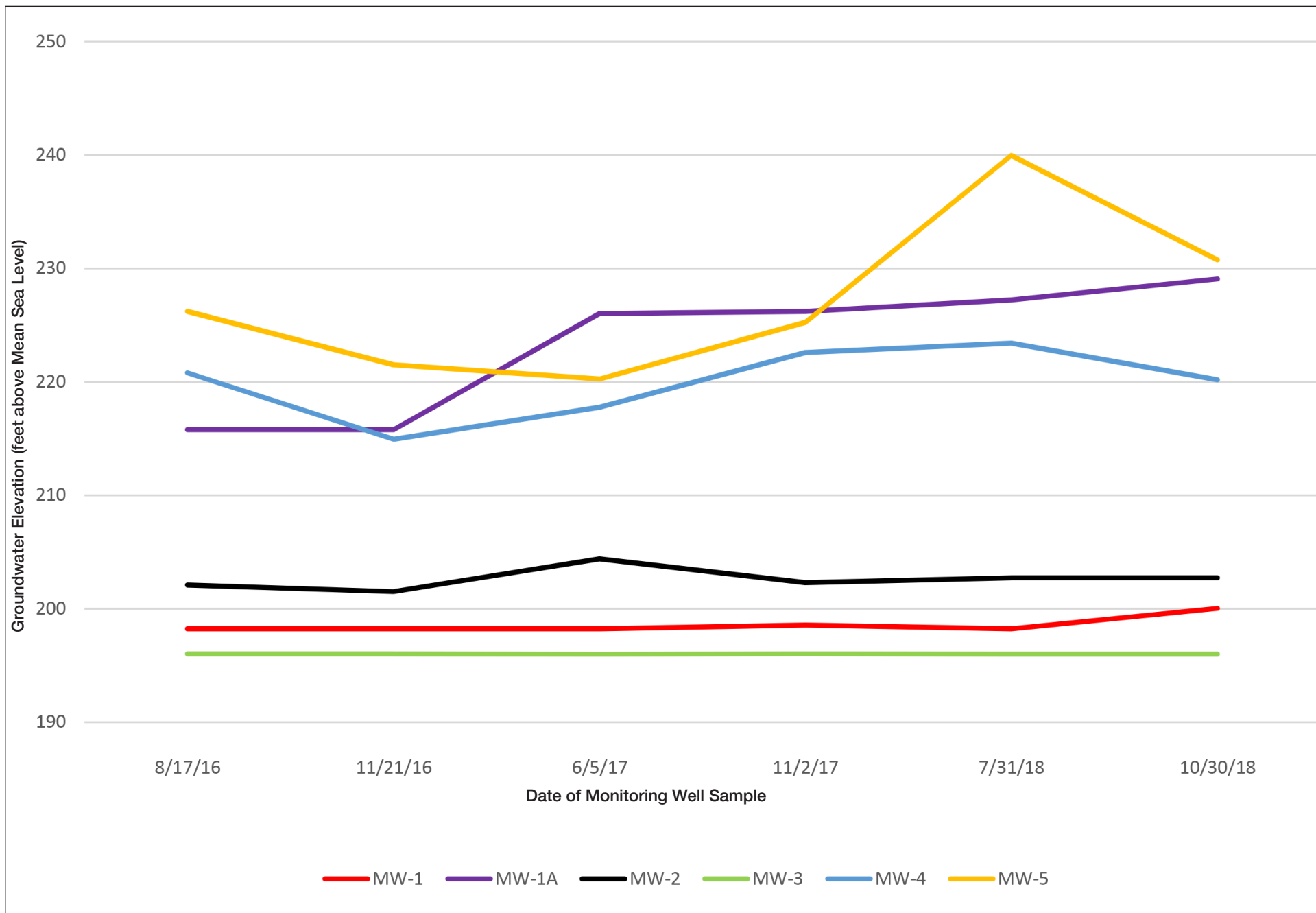
¹¹ Levels in wells MW-2, and MW-3 have been low or undetectable and have had insufficient water for analysis.



SOURCE: Planning Partners 2021

Hillcrest Dairy Expansion Project CUP20-013

Figure 10-1
Monitoring Well Location Map



SOURCE: Sousa Engineering 2018

Hillcrest Dairy Expansion Project CUP20-013

Figure 10-2
Hillcrest Dairy Historical Groundwater Levels

10.2.4 EXISTING WATER QUALITY

The Merced Groundwater Subbasin GSP describes groundwater in the subbasin as characterized by calcium-magnesium bicarbonate type water in the interior of the subbasin, sodium bicarbonate to the west, and calcium-sodium bicarbonate to the south. Sodium chloride and calcium-sodium chloride type waters exist in small areas in the southwest area of the subbasin. Total dissolved solids (TDS) values range from 100 to 3,600 milligrams per liter (mg/L) across the subbasin with typical values ranging from 200 to 400 mg/L. Localized areas of high hardness, iron, nitrate, and chloride are found in this subbasin. Dibromochloropropane (DBCP)¹² and Hard Water¹³ are parameters of interest in the Planada area. (GSP 2019)

Water quality data from the PCSD, which provides both water and sewage services to the community of Planada and a few outlying areas, is available for 2018-2020. The PCSD includes the urban community of Planada (located approximately 0.73 miles south of the project site) and two farm labor housing facilities located approximately 0.40 mile west and 0.52 miles southwest of active dairy facilities (see Figure 10-3). Table 10-1 shows that from 2018-2020, there have been no detections in PCSD wells of human and animal fecal waste, or drinking water quality exceedances for nitrates or Electrical Conductance (EC)¹⁴.

Table 10-1 Drinking Water Quality Results for the Planada Community Services District Groundwater Supply Wells					
Sampling Results Showing the detection of Coliform Bacteria					
Microbiological Contaminants	Highest No. of Detections	No. of Months in Violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria (State Total Coliform Rule)			See Note 1	0	Naturally Present in the environment
	(in a mo.)				
2018	0	0			
2019	0	0			
2020	0	0			
Fecal Coliform Bacteria or <i>E. coli</i> (State Total Coliform Rule)			See Note 2	None	Human and animal fecal waste
	(in a year)				
2018	0	0			
2019	0	0			
2020	0	0			
<i>E. Coli</i> (Federal Revised Total Coliform Rule)			See Note 3	0	Human and animal fecal waste
	(in a year)				
2018	0	0			
2019	0	0			
2020	0	0			

¹² DBCP is a soil fumigant, the use of which was banned in 1977.

¹³ Hard Water = Total hardness > 150 mg/L (mg/L = milligrams per liter = parts per million).

¹⁴ The reason that the conductivity of water is important is because it can be used to describe the amount of dissolved substances, chemicals, and minerals that are present in the water.

Table 10-1 Drinking Water Quality Results for the Planada Community Services District Groundwater Supply Wells

Detection of Contaminants with a Primary Drinking Water Standard					
Sample Date	Average Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Nitrate as Nitrogen (ppm)					Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
2018	5	3 – 7	10	10	
2019	5	3 – 7	10	10	
2020	3	2 – 5	10	10	
Detection of Contaminants with a Secondary Drinking Water Standard					
Electrical Conductivity (EC) (mmhos /cm)					Substances that form ions when in water; seawater influence
2016-2018	0.435	0.250-0.608	0.9 - 1.6	N/A	
2017-2019	0.428	0.317-0.550	0.9 - 1.6	N/A	
2019-2020	0.340	0.290-0.520	0.9 - 1.6	N/A	

Notes: MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; PHG = Public Health Goal

1. More than 1 sample in a month with a detection; two or more positive samples is a violation of the MCL
2. A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or E. coli
3. Routine and repeat samples are total coliform-positive or system fails to take repeat samples following E. coli-positive routine sample or routine sample or system fails to analyze total coliform-positive repeat sample for E. coli.

Source: California State Water Resources Control Board, 2022. *CA Drinking Water Watch. Planada Community Services District Consumer Confidence Reports for 2018, 2019, 2020.*

Water quality data collected as required by the General Order for Existing Milk Cow Dairies was available from July 2020 for the two of the project site domestic wells and seven irrigation wells, is summarized in Table 10-2. From the 2020 sample, concentration of nitrate as nitrogen ranged from <0.140 to 10.9 mg/L, with one well detection reported slightly above the California Title 22 Primary Maximum Contaminant Limit (MCL) of 10 mg/L. Electrical Conductance (EC) ranged from 0.330 to 1.79 mmhos/com, with one detection above the Title 22 Secondary MCL of 0.9 to 1.6 mmhos/com. Similarly, there was one detection above the Soluble Salts Title 22 Secondary MCL of 500 to 1,000 mg/L, with a range of 211 to 1,150 mg/L (see Table 10-2).



Hillcrest Dairy Expansion Project CUP20-013

Planada Community Services District Sphere of Influence and Service Area Boundaries

Table 10-2 Well Water Quality at the Hillcrest Dairy

Sample Name	Electrical Conductivity (EC) (mmhos /cm)	Nitrate as Nitrogen (mg/L)	Soluble Salts (mg/L)
Water Quality Standard*	0.9 - 1.6	10	500 – 1,000
10990 S. Bear Creek (Well)	0.371	3.14	237
10090 S. Bear Creek (Well)	0.330	<0.140	211
D135 (Irrigation)	0.387	<0.140	248
F117 (Irrigation)	1.79	2.21	1,150
F134 (Irrigation)	0.457	4.81	292
F104 (Irrigation)	0.510	10.9	326
F108 (Irrigation)	0.702	0.790	449
F118 (Irrigation)	0.437	2.51	280
F116 (Irrigation)	0.352	1.32	225

Notes: Data collected July 7, 2020. **Bold: MCL exceedance**
 ND - not detect. MCL - Maximum Contaminant Limit. mmhos /cm = mili-mhos/centimeter. mg/L = miligrams/liter. ppm = parts per million.
 * Nitrate as NO₃ is a California Title 22 Primary Maximum Contaminant Limit, which address health concerns.
 EC and Soluble Salts is a California Title 22 Secondary Maximum Contaminant Level goal. EPA Secondary MCLs are specific water quality aesthetics, taste, and odor.

Source: *Compliance Analysis Report, Hillcrest Dairy. Denele Analytical, Inc. 2020.*

10.2.5 SURFACE WATER FEATURES

Natural drainage for the project site and vicinity is to the northwest, towards Bear Creek, but the topography of the dairy facilities and agricultural fields has been modified to benefit water supply delivery and drainage/circulation.

The Planada Canal and Le Grand Canal cross the site generally along the perimeter of the dairy facilities and are part of the Merced Irrigation District (MID) conveyance system (see Figure 10-1). MID also operates and maintains the Hayden Lateral “A” south and east of the site and the Planada Lateral (A) northwest of the site. Irrigation water for the project site is obtained from on-site groundwater wells and the MID canals. A ditch system is used to distribute fresh irrigation water and irrigation water mixed with wastewater to cropped fields and orchards. Receiving fields have been graded and developed with tailwater return systems that recirculate tailwater to irrigated fields.

10.2.6 FLOODING

The Flood Insurance Rate Maps from FEMA show that the dairy site and application fields are located within Zone X. Areas within the FEMA designation Zone X are defined as an area outside the FEMA designated 100-year and 500-year floodplains.

10.2.7 PATHOGENS, ANTIBIOTICS, PESTICIDES, AND HORMONES IN MANURE

The potential for pathogens, antibiotics, pesticides, and hormone transport in manure was evaluated in the ACO EIR. The discussion below provides a summary and update of the analysis contained in the ACO EIR.

PATHOGENS

Animal agriculture, such as dairies, results in the production of copious amounts of manure. On a per weight basis, livestock animals produce from 13 to 25 times more manure than humans. This manure is ultimately used as fertilizer for crops, either through the application of dairy wastewater or the incorporation of solid manure onto cropland (either on site or by trucking dry manure off site). Animal wastes contain zoonotic pathogens, which are viruses, bacteria, and parasites of animal origin that can cause disease in humans. Diseases that can be caused by zoonotic pathogens include Salmonellosis, Tuberculosis, Leptospirosis, infantile diarrheal disease, Q-Fever, Trichinosis, Cryptosporidiosis, and Giardiasis. Health effects generally include mild diarrhea, fever, headaches, vomiting, and muscle cramps. In more severe cases, however, these diseases may cause meningitis, hepatitis, reactive arthritis, mental retardation, miscarriages, and even death, particularly in the immunocompromised. (EPA 2005)

Human infection from zoonotic pathogens occurs through various routes, including contaminated air, contact with livestock animals or their waste, swimming in water impacted by animal feces, exposure to potential vectors (such as flies, mosquitoes, water fowl, and rodents), or consumption of food or water contaminated by animal wastes. Regulatory limits on the concentrations of pathogens in the environment protective of human health have not been established. Based on epidemiological evidence, the fecal indicator bacteria *E. coli* and enterococci provide the basis for local, state, and federal water quality regulations. (EPA 2005; LPE Learning Center 2019)

In general, agricultural soils tend to create relatively effective barriers by filtering pathogens/parasites from percolating water, thereby minimizing groundwater contamination. Important exceptions are sandy or rocky soils, which generally allow for greater infiltration of organisms through the soil profile than heavier soils. Movement of bacteria and viruses increases in saturated soils, and percolating water can provide a mechanism for downward movement. Additionally, plant roots tend to increase the movement of bacteria through soil (USDA 2000). Finally, improper installation of wells can allow for direct contamination of groundwater via the leaching of organisms along the well casing.

The survival of pathogens in manure varies by pathogen, environment, and temperature. It has been reported that *Cryptosporidium* oocysts¹⁵ can survive up to two weeks in surface water. Other research reports have shown that *E. coli* can survive 84 days in manure. Generally speaking, microbial survival is lowest during times when the temperatures are high, sunlight is present, and the environment is dry. There may be higher proliferation of pathogens in manure slurry than dry manure (EPA 2005). Further, organisms are known to survive longer in the anaerobic state than in aeration. This is most likely because the generation of heat from bacterial breakdown of organic material in aerated material is sufficient to shorten bacterial life spans. (USDA 2000)

¹⁵ *Cryptosporidium* is a protozoan parasite that causes a parasitic disease that affects the intestines. The parasite is transported in an oocyst, an environmentally hardy microbial cyst.

Several options are available for treatment of manure transferred from animal operations to minimize the presence of pathogens. These options include aerobic lagoons, anaerobic lagoons, controlled anaerobic digestion for methane, composting, and constructed wetlands. Pathogens can also be managed by cleaning pens regularly and keeping them dry (Augustin et al 2011). Therefore, good pathogen practice, such as cleaning clothing after working or visiting a dairy facility, tracking visitor activity, and cleaning, adequately drying, and disinfecting manure handling equipment can greatly reduce hazards related to pathogen outbreaks (Augustin et al 2011).

ANTIBIOTICS

Antibiotics are used in animal feeding operations and may appear in animal wastes. The practice of feeding antibiotics to poultry, swine, and cattle evolved from the 1949 discovery that the application of very low levels of antibiotics usually improved animal growth and development. The primary mechanisms of the elimination of antibiotics in animals are in the discharge of urine and bile. Essentially all of an antibiotic administered is eventually excreted, whether unchanged or in metabolite form. Little information is available regarding the concentrations of antibiotics in animal wastes, or on their fate and transport in the environment (EPA 2013; EPA 2018).

The industrialization of livestock production and the widespread use of non-therapeutic antibiotics has intensified the risk for the emergence of new, more virulent, or more resistant microorganisms. These have reduced the effectiveness of several classes of antibiotics for treating infections in both humans and livestock. A report issued by the U.S. Centers for Disease Control and Prevention states that more than 2.8 million antibiotic-resistant infections occur in the U.S. each year, and more than 35,000 people die as a result. Resistant germs can spread between animals and people through food or contact with animals (CDC 2020). However, microbial risk assessment is an evolving discipline. Methods have not been developed for estimating risks associated with more than one antibiotic and one bacterium at a time (Gilchrist et. al. 2007).

The Food and Drug Administration (FDA) issued guidance in April 2012 that sought to stop farmers and ranchers from feeding antibiotics to cattle, pigs, chickens and other animals simply to help the animals grow larger. Under a voluntary initiative, farmers and ranchers needed a prescription from a veterinarian before using antibiotics in farm animals. As of January 2017, the use of medically important antibiotics for growth promotion is no longer permitted by the FDA (USFDA 2021).

Dairies administer significantly less antibiotics proportionally per animal than other animal confinement facilities since most antibiotics are prohibited for use with lactating cows (Watanabe, et. al. 2010). Antibiotics are often only used to treat sick animals and are not routinely administered, though some dairies may administer antibiotics to calves, heifers, and dry cows. Animals being treated with antibiotics are removed from the milking herd and isolated until treatment is completed. Waste milk from animals treated with antibiotics is commonly fed to calves. Additionally, waste from animals being treated with antibiotics is typically managed within the normal waste stream of a dairy. Therefore, environmental pathways that may allow antibiotics to be transported into groundwater include leakage from wastewater lagoons, leaching of manure applied to fields, and leaching from animal housing areas (Watanabe, et. al. 2010; Pollard and Morra 2017).

A study completed by University of California, Davis researchers investigated the use and occurrence of antibiotics in dairy confined animal feeding operations and their potential transport

into first-encountered groundwater. The July 2010 study found that antibiotics were detected ubiquitously at the surface and in the waste stream of the dairy, but generally degraded in the top layers of soils. Even after decades of use, the study indicated that antibiotics are not generally transported in groundwater beyond the boundaries of the farms. Overall, the detection of several antibiotics in soil samples indicates that different antibiotic types move differently through the subsurface environment, and therefore all production areas of dairies could be considered a potential source of antibiotics in shallow groundwater. The study also suggested that proper dilution of lagoon water with irrigation water and controlling the loading rate of wastewater to cropped fields could promote degradation and sorption¹⁶, and thereby attenuate the movement of certain types of antibiotics in the environment. The results of the study suggests that intensive sampling campaigns are necessary to properly evaluate animal farms as sources of antibiotics, and further studies would be required to determine specific best management practices for improved antibiotic attenuation. (Watanabe, et. al. 2010; Pollard and Morra 2017)

PESTICIDES AND HORMONES

Pesticides and hormones are compounds that are used in animal feeding operations and can be expected to appear in animal wastes. Both of these types of pollutants have been linked with endocrine (hormonal) disruption in humans and animals. Pesticides are applied to livestock to suppress houseflies and other pests, and are often used in the production of livestock feed. Little information is available regarding the concentrations of these compounds in animal wastes, or their fate/transport behavior and bioavailability in waste-amended soils (EPA 2018).

Specific hormones are used to increase productivity in the beef and dairy industries. Several studies have shown that hormones are present in animal manures in situations where hormones are fed or applied to animals. Most studies to date have evaluated poultry manure, which has been shown to contain both estrogen and testosterone. Runoff from fields with land-applied manure has been reported to contain estrogens, estradiol, progesterone, and testosterone, as well as their synthetic counterparts.

Recombinant Bovine Growth Hormone (rBGH or also known as Bovine Somatotropin or BST) is a genetically engineered copy of a naturally occurring hormone produced by cows. This hormone is used by some milk producers. The purpose of rBGH is to enable cows to produce more milk than they naturally produce. The hormone is destroyed in the cow's gut. The hormone is approved by the Federal Food and Drug Administration. This hormone is not used at the Hillcrest Dairy operations, nor would it be used with implementation of the dairy expansion project.

TRACE MINERALS

Trace mineral supplements are generally provided in the daily feed for the dairy herd and are essential for common biological processes. As evaluated in the EIR for the Merced County Animal Confinement Ordinance (Merced County 2002), approximately 90 to 95 percent of dairies in Merced County use feed additives for selenium (and other trace metals) because feed in Merced County is lacking in selenium. Trace minerals can improve herd health and efficiency, as research has shown that minerals can improve fertility, decrease infections, prevent lameness, and increase milk production. In most cases, trace elements are only partially absorbed by the cow, and some of the

¹⁶ Sorption is the process by which one substance becomes attached to another.

elements are excreted in the manure or urine. Through the application of wastewater and dry manure to cropland, trace minerals can accumulate in the soil.

Water contamination and plant toxicity are common detriments associated with a high concentration of metals. Most environmental concerns are focused on the over-application of nitrogen and phosphorous. However, other elements, currently not regulated in dairy manure, are routinely overfed, or have low absorption efficiency and may be excreted in large quantities in animal manure (Brock et. al. 2006; Indraratne et. al. 2021). Several studies have identified copper and zinc as a concern since they are frequent minerals used on the dairy herd and could accumulate in manure-amended fields. A reduced yield has been documented for various types of grasses and corn after application of copper to the soil (Flis et. al. 2006).

Possible strategies for minimizing excess minerals in the manure would be reducing the total amount of minerals in the ration or improving the efficiency of animal mineral use (using more bioavailable supplements). The National Research Council (NRC) requirements for dietary minerals have been found to be adequate for dairy cattle health, and any additional increase beyond NRC requirements in the diet is unnecessary (Brock et. al. 2006). The results from several studies suggest that reduction in the concentration of dietary minerals is potentially the most efficient way of reducing overall excretions and whole-farm surpluses of these minerals. Further, minerals in the water may affect excretion of them from the cows, and at some dairies, controlling water contributions when formulating animal diets could reduce the amount of minerals in manure and overall land application (Castillo et. al. 2007).

10.3 ENVIRONMENTAL EFFECTS

10.3.1 SIGNIFICANCE CRITERIA

As set forth in Appendix G to the State CEQA Guidelines, Section X, *Hydrology and Water Quality*, the following criteria have been established to quantify the impact of an adverse effect for evaluation pursuant to CEQA. A project would normally result in a significant impact if the project would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. (X.a)
- Substantially decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin. (X.b)
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - result in substantial erosion or siltation on- or off-site; (X.c.i)
 - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; (X.c.ii)
 - 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; (X.c.iii)
 - or impede or redirect flood flows. (X.c.iv)
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. (X.e)

Additional hydrology and water quality assessment criteria previously evaluated in the project IS/NOP include whether the project would:

- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation. (X.d)

This impact was found to be less than significant in the IS/NOP (see Appendix A), therefore, it will not be evaluated further in this chapter.

10.3.2 ENVIRONMENTAL IMPACTS

PROPOSED PROJECT OPERATIONS AND NMP AND WMP SUMMARY

The project applicant has prepared a proposed NMP/WMP, both dated August 2020, as required by the CVRWQCB General Order for Existing Milk Cow Dairies. A professional engineer registered in the State of California and a Certified Crop Advisor completed the required elements of the NMP/WMP. The NMP and WMP for the existing dairy operations, dated October 2019, were used to establish a baseline of existing conditions.

The existing facility consists of freestall barns and open corrals, milking parlor, commodity barn, feed storage slab, and solid manure stacking area. Animal wastes from freestall and other concrete-surfaced areas are flushed to an on-site waste management system that consists of two settling basins, three wastewater storage ponds, and a sand trap with four mechanical separators. All ponds are earthen-lined. The area of active dairy facilities has been graded to direct corral runoff to the existing waste management system. Stormwater runoff from impervious surfaces and roofed areas is routed to the wastewater pond, except for stormwater from the milking parlor, which is routed to a yard. Recycled water is used to clean the milk parlor floor and is the source of sprinkler pen water.

Corrals are scraped at least two times per year. Solid manure currently is stockpiled in windrows in the manure stacking area. Some of the solid manure is used as bedding, applied on the project site, or hauled off site to fields in the project vicinity. Dry manure is applied to dairy cropland using calibrated spreader trucks with manure incorporated into the soil within 24 hours of application. There is no manure composting onsite. Manure solids are separated from liquids with a sand trap and four mechanical separators combined with two solid separation basins. As reflected in the NMP, approximately 19,998 tons of solid manure is exported and applied to off-site fields not owned by the dairy operator.

Domestic water to the site and dairy barns is provided by three on-site water wells. Irrigation water is supplied by surface water sources from MID canals, MID groundwater wells, and seven (7) irrigation wells. Wastewater is mixed with irrigation water and applied to cropland. For fields receiving wastewater and/or solid manure, collected tailwater is recycled and returned to the top of a field, returned to a tailwater pond for reuse, or drained through an adjacent field to the tailwater pond. The dairy facility uses both surface water and groundwater resources for farm operations.

As shown in Table 3-3 of Chapter 3, *Project Description*, existing herd numbers at the Hillcrest Dairy include 8,050 cows, which would increase to 7,750 cows with the proposed expansion. The proposed project would include the construction of one new freestall barn measuring 50,000 square feet, one maternity barn measuring 13,678 square feet, three dry cow shade barns measuring 44,000 square feet each, and open heifer corrals to house 700 support stock. Modification of the proposed facilities would occur within the existing footprint of the dairy, and there would be no change in cropped acreage associated with the farm.

Stormwater runoff from impervious surfaces and roofed areas would continue to be routed to the wastewater pond, except for stormwater from the milking parlor, which is routed to a yard. Animal wastes from freestall and other concrete-surfaced areas would continue to be flushed to the existing on-site waste management system, except for solid manure within corral areas, which would continue to be scraped. Liquid manure would continue to be directed to the solid settling basins and wastewater storage ponds. Wastewater would continue to be mixed with irrigation water and applied to the fields.

As reported in the NMP, exported solid manure applied to off-site agricultural fields not owned by the project applicant would increase from 19,998 tons of solid manure from the dairy facility to 33,198 tons of solid manure¹⁷ with the proposed expansion (increasing from approximately 70-75 percent under existing conditions to 75-80 percent of previously separated solids under proposed conditions). While the exact location of these off-site cropland parcels may vary throughout operations, the disposal of manure at off-site locations and the acreage necessary to properly dispose of manure liquids and solids are accounted for in the project NMP.

According to the General Order, nitrogen application rates shall not result in total nitrogen applied to the land application areas exceeding 1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop, unless plant tissue sampling identifies a need to increase fertilizer application of a specific crop. The whole farm nitrogen balance is a ratio that reflects the total nitrogen generated by the operation minus losses and exports, divided by the nitrogen removed by crops. The General Order requires that if the whole farm nitrogen balance is greater than 1.65, a review must be made of nitrogen inputs and outputs at the facility to identify how to reduce inputs to meet the standard.

$$\begin{aligned} \text{field nutrient balance ratio (applied to removed)} &= \\ \text{nitrogen applied (from irrigation/fertilizer/manure)} &\div \text{total N removed by crops} \\ \\ \text{whole farm nitrogen balance} &= \\ (\text{N stored} + \text{N imported} + \text{atmospheric N} - \text{N exported}) &\div \text{total N removed by crops} \end{aligned}$$

Under existing conditions as reported in the NMP, total annual gross nitrogen generated by the dairy facility is estimated at 1,742,521 pounds/year. Nitrogen exports currently total 617,438 pounds/year.

¹⁷ The dairy facility has a limited land base. The proposed increase in herd would result in an associated increase in manure and greater increase in exports. With the amount of irrigated land in the area, there is a high demand for dairy manure as an economical fertilizer source for other growers, and the increased manure to be exported would easily be sold to third-party fertilizer companies.

After ammonia losses, existing operations at the dairy facility reflect a whole farm nitrogen balance ratio of 1.65.

With implementation of the proposed expansion as reported by the August 2020 proposed conditions NMP, total annual gross nitrogen generated by the expanded facility would increase to 2,175,870 pounds/year. A total of 1,044,907 pounds/year of nitrogen would be removed through nitrogen exports as solid manure. After ammonia losses, the whole farm balance ratio would be 1.40. The net volume of nitrogen exported would increase as referenced over existing conditions and reduce the whole farm nitrogen value.

Water used at the dairy barn is sourced from the domestic dairy groundwater wells at the milkbarn. There are currently 77,511 gallons per day (approximately 28.29 million gallons per year) of milkbarn process wastewater generated by the existing dairy. The proposed expanded dairy operations would generate approximately 87,021 gallons per day (approximately 31.76 million gallons per year) of milkbarn process wastewater. There would be a 3.47 million gallon per year increase in milkbarn process wastewater generated with the proposed dairy expansion. This increase in milkbarn process water use is related to an increase in milk cows per string, bulk tank wash wastewater, and increased plate cooler volume.

Total process wastewater generated by the existing dairy operations includes 317,797 gallons per day (approximately 116 million gallons per year) sent to the ponds (which includes process water from the milkbarn and manure and bedding, rainfall runoff into ponds, and direct rainfall onto ponds). The proposed expanded dairy operations would generate approximately 335,676 gallons/day (approximately 122.5 million gallons/year) of process wastewater. There would be a 6.5 million gallon per year increase in process wastewater generated with the proposed dairy expansion and sent to the ponds. Process wastewater from the ponds would continue to be mixed with irrigation water and applied to crops.

The irrigation water demand of the existing farming operations is estimated by multiplying the croppable acres by the estimated average irrigation demand per acre. The existing NMP estimates an irrigation demand for fields double-cropped in corn and sorghum sudan, double-cropped in wheat and corn, and pistachio orchards. As reported in the existing conditions NMP, there are approximately 362 acres double-cropped in corn and sorghum sudan, 785 acres double-cropped in wheat and corn, and 464 acres planted with pistachios. For cropped acreage receiving wastewater or solid manure¹⁸, the total irrigation demand is estimated at 5,434 acre-ft/year, or 1.77 billion gallons of water annually. For the proposed expansion, the estimated irrigation demand would remain at 1.77 billion gallons as no change is proposed to the cropped acreage or crop types. The estimated wastewater component of the total irrigation demand for existing operations is estimated at 6.6 percent¹⁹ of total water volume, not accounting for pond evaporation and evapotranspiration. The estimated wastewater component of the total irrigation demand for proposed operations is estimated

¹⁸ Based on information in the NMP, the irrigation demand for the pistachio orchards was estimated to be 1,545 acre-feet/year, or 503 million gallons per year, and would not change with project implementation.

¹⁹ The estimated wastewater component for existing operations was determined by calculating the percentage of total irrigation water demand, 1.77 billion gallons, provided by the wastewater generated per year, in this case 116 million gallons per year.

to be 6.9 percent²⁰ of total water volume, not accounting for pond evaporation and evapotranspiration.

In summary, the proposed NMP/WMP establishes the following required facility improvements for the herd and potential areas of sensitivity under the proposed expansion²¹:

- Proposed nutrient application rates meet required agronomic rates of 1.4 or less for best management farming practice mandated by the CVRWQCB. The applied-to-removed ratio for nitrogen under existing conditions is 1.29, and would increase to 1.34 for proposed conditions. The whole farm nitrogen balance under existing conditions is 1.65, and would decrease to 1.40 with nitrogen exports.
- The recommended amount of salt applied to cropland will be provided in the future versions of the approved NMP for the dairy.
- The 48,343,059 gallons of storage capacity for the three wastewater storage ponds would be sufficient to permit storage of wastewater generated by the facility for a 120-day cycle during normal precipitation periods and 1.5 factor normal precipitation periods. The total wastewater storage capacity required during 1.5 factor normal precipitation periods is 40,740,232 gallons under existing conditions, and 43,342,381 gallons under proposed conditions. Pond freeboard capacity is used to address 100-year storm events. All ponds are earthen-lined.
- A tailwater collection system is used to prevent the movement of water offsite. Collected tailwater is recycled and returned to the top of field, returned to the tailwater pond for reuse, or drained through the adjacent field to the tailwater pond.
- Stormwater runoff from impervious surfaces and roofed areas would continue to be routed to the wastewater pond, except for stormwater from the milking parlor, which is routed to a yard.
- The site is in the Federal Emergency Management Agency (FIRM 2008) Zone X, and as discussed in Section 2.8. Zone X is not subject to inundation by the 100 and 500-year storm events.
- Approximately 1,611 acres of the project site are currently used for the production of crops, including forage crops and pistachios; however, only 1,147 acres of this cropland currently receives manure process water and/or solid manure. Approximately 464 acres of cropland are planted in pistachios, and do not receive solid manure. Future crops could vary from those discussed above as long as nitrogen balance requirements are met. Additional off-site fields not owned by the dairy operator could receive solid manure and wastewater as a purchased soil amendment.

The NMP demonstrates that the proposed dairy facility would, after off-site disposal of solid wastes, comply with the nitrogen loading groundwater protection requirements of the CVRWQCB and the Merced County ACO. The NMP shows the whole farm balance would be reduced from 1.65 at the

²⁰ The estimated wastewater component for proposed operations was determined by calculating the percentage of total irrigation water demand, 1.77 billion gallons, provided by the wastewater generated per year, in this case 122.5 million gallons/year.

²¹ These standards and improvements do not address potential environmental effects from the proposed expansion. For an evaluation of these effects and required additional mitigation, see Impacts HYD-1 through HYD-8 in this chapter.

existing dairy facility, to 1.4 with the proposed expansion, and that the whole farm balance ratio would remain below the regulatory limit of 1.65.

Impact HYD-1: Degradation of water quality due to storm water runoff during project construction (Criteria X.c.i, VII.b)

Construction of the proposed project could result in the erosion of on-site soils or the loss of topsoil, which could cause degradation of water quality in waterways draining the site by reducing the quality of storm water runoff during project construction. This would be a significant impact.

The proposed facilities would be constructed within the existing dairy footprint. Storm water runoff during the construction period could result in the siltation and sedimentation of waterways draining the site, or in the transport of pollutants used during construction.

Construction activities disturbing one or more acres are required by the State Water Resources Control Board (SWRCB) to obtain a Construction General Permit (Order 2009-0009-DWQ). This Construction General Permit provides a risk-based approach to managing stormwater discharge. The Construction General Permit has three risk level categories based on sedimentation risk and receiving water risk. Each risk category has specific Best Management Practices (BMP) that must be implemented with specific monitoring, sampling, and reporting requirements. The Construction General Permit also sets specific numeric action levels (NAL) for pH and turbidity.

The Construction General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) and a Rain Event Action Plan (REAP) to be developed by the discharger, who must implement these plans – and also comply with specific requirements of the Construction General Permit. The SWPPP must list any BMPs that the discharger will use to protect storm water runoff, and define the placement of identified BMPs. Additionally, the SWPPP must contain: a visual monitoring program; a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan.²²

Although compliance with the RWQCB’s Construction General Permit and its requirement that a SWPPP be prepared and implemented would reduce potential effects from storm water runoff, to ensure implementation of storm water regulatory requirements and coordination with standard County building review processes to reduce the potential water quality impacts during construction, the following mitigation measure would be required.

Significance of Impact: Significant.

Mitigation Measure HYD-1:

The project applicant shall submit Permit Registration Documents (PRD) for the Construction General Permit Order 2009-0009-DWQ to the State Water Resources Control Board, and comply with, and implement, all requirements of the permit. A Legally Responsible Person (LRP) shall electronically submit PRDs prior to commencement of construction activities in the Storm Water Multi-Application Report Tracking System. PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the Storm Water Pollution Prevention Plan (SWPPP), a

²² Adherence to the requirements of the State’s Construction General Permit would satisfy Merced County storm water management regulations set forth in Chapter 9.53 of the Merced County Code.

signed certification statement by the LRP, and the first annual fee. Following submittal of a Notice of Intent package and development of a SWPPP in accordance with the Construction General Permit, the applicant will receive a Waste Discharge Identification Number from the SWRCB. All requirements of the site-specific SWPPP, including any revisions, shall be included in construction documents and must be available on site for the duration of the project. Proof of registration shall be submitted to the Merced County Building Department prior to the initiation of construction.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Project compliance with State Water Resources Control Board and Merced County regulations to avoid siltation effects would reduce this impact to less than significant.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Building Department and the SWRCB shall monitor for compliance. Implementation of HYD-1 shall occur prior to and during construction.

Impact HYD-2: Degradation of surface water quality from operation of the Hillcrest Dairy Expansion (Criterion X.a)

The project would not result in the degradation of surface water quality during project operations. Crop fields associated with the existing and proposed expansion of the dairy are developed with an existing tailwater collection system. Wastewater is applied, and would continue to be applied, in accordance with ACO and CVRWQCB requirements. This would be a less-than-significant impact.

As noted on USGS topographic maps, there are MID surface water canals in the project vicinity. Bear Creek is located approximately one mile north of project site active dairy facilities. Miles Creek is located approximately one mile south of active dairy facilities and just east of Planada.

There is an existing irrigation system that consists of a surface flood system coupled with tailwater retention and recycling. For fields receiving wastewater and/or solid manure, collected tailwater is recycled and returned to the top of field, returned to the tailwater pond for reuse, or drained through the adjacent field to the tailwater pond. The tailwater return system is used to prevent the movement of water off site and allow the recycling of applied wastewater²³. The existing, extensive field ditch and berm system has been used to minimize irrigation water use and subsequently minimize the potential for runoff.

As required by the Dairy General Order WDRs, the dairy operator must document compliance with provisions to prevent backflow or direct discharge of wastewater to surface water resources. Locations of cross-connections with wastewater and surface water must be identified, along with

²³ Information on Field 25 and 26 in the NMP has been updated by the project applicant. Field 25 has been improved with a tailwater return system and receives wastewater. There are control valves in place on Field 26 to prevent discharge off field to Miles Creek following manure applications.

how backflow can or does occur at each location, and any current backflow preventive measures. No surface water connections for irrigation are known to exist at the site at this time. According to the project engineer, the potential for backflow has been evaluated and this survey has determined that there are no cross-connections on the site that would allow for direct discharge to surface or groundwater. A self-certification will be completed by the applicant as part of WDR requirements.

With regular inspection and water testing requirements, ongoing maintenance would occur for the wastewater application system and tailwater retention system to ensure the systems are working properly. The continued use of good farming practices and application of wastewater at agronomic rates detailed in the NMP and as required by the ACO and the individual WDRs would minimize potential impacts to surface water. Due to the extensive tailwater retention system, the BMPs for liquid and solid manure application, and backflow prevention compliant with Dairy General Order requirements, no surface water discharge from these manured areas is anticipated, and no adverse impacts to surface water would occur as a result of the proposed dairy expansion. This would be a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure HYD-2: None required.

Impact HYD-3: Groundwater contamination from operation of the Hillcrest Dairy Expansion (Criterion X.a)

Expanded operations at the Hillcrest Dairy could result in degradation of groundwater resources. This would be a significant impact.

The proposed dairy expansion has the potential to impact the underlying groundwater quality with the continued application of nutrients, salts, and other compounds. Based on the existing water quality data collection of irrigation and dairy wells required by the Dairy General Order, one irrigation well showed slightly elevated concentrations of nitrate as N, and one irrigation well showed slightly elevated detections of EC and soluble salts above the Title 22 Secondary MCL (see Table 10-2 for water quality data). Beyond these exceedances, the on-site domestic wells and irrigation wells demonstrated good water quality. While area groundwater quality reported by SGMA resources shows very limited data for interpretation, information obtained and reported by the Planada CSD for water supply wells located south and west of the dairy showed no drinking water quality exceedances for nitrates or EC from 2018-2020 (see Table 10-1).

The Hillcrest Dairy is part of the Central Valley Dairy Representative Monitoring Program (CVDRMP), developed in accordance with Dairy General Order requirements and with review by the CVRWQCB. As stated above, the CVDRMP has found that shallow groundwater has been affected across the Central Valley due to historic or current animal confinement operations, especially underlying cropland. Sources of potential additional contamination from the expanded dairy are discussed below.

Areas of Potential Groundwater Contamination from Waste Storage and Application on the Dairy

The Hillcrest Dairy Expansion project would concentrate animals and their wastes within the feeding areas, and to a lesser degree, within open corrals. Waste from the concrete lined feed lanes would be flushed to the on-site wastewater management system for treatment and storage in ponds as referenced in the existing WMP.

Wastewater Storage and Treatment Ponds. The existing treatment and storage ponds receive wastewater as described in the project NMP/WMP. Pond construction information was not available for review. According to the project applicant, the ponds are earthen embankment structures constructed to the standards in place at that time. Following solids removal from the four mechanical separators and two settling basins, the wastewater with dissolved constituents are stored in the three wastewater storage ponds for later application in irrigation water to crops. All basin structures would continue to be subject to regular maintenance.

The existing dairy wastewater ponds have the potential to impact groundwater because they contain elevated concentrations of inorganic and organic constituents, and because hydraulic pressure and gravity force liquids downward through soils to groundwater. As described above, there would be an increased volume of wastewater sent to the pond under proposed conditions. However, since no changes to the existing pond construction or operation are proposed with the dairy modification, the hydraulic pressure within the existing ponds and overall pond leakage would stay the same. Therefore, there would be no anticipated increase to groundwater quality impacts from the ponds with implementation of the proposed project.

Corrals and Freestall Barns. The dairy expansion would continue to use open-air, concrete-lined feed lanes which are roofed, where animals are fed and watered, and waste is collected. Outside of the feed lanes and covered loafing areas, cows are allowed to roam in uncovered areas where manure is collected two times a year, which meets Dairy General Order standards and minimizes the potential impact. Liquid discharge from corrals is minimal.

Crop Fields. Dry and liquid manure are used to fertilize dairy cropland. A tailwater collection system, composed of berms, piping, and sumps, is used to prevent the movement of water off site and allow the recycling of applied wastewater. The land application area would not be changed from existing conditions with the proposed expansion. The applied-to-removed ratio for nitrogen under existing conditions is 1.29, and would increase to 1.34 for proposed conditions. While there would be a minor increase in nutrients applied, the proposed nutrient application rates meet required agronomic rates of 1.4 or less for best management farming practice mandated by the CVRWQCB. There would be no significant increase in potential for groundwater contamination from crop fields.

Potential Impacts from Wastewater Constituents

The proposed operations must comply with the NMP and WMP as proposed by the CVRWQCB to be issued in the individual WDR as follows:

- With implementation of the proposed operations NMP/WMP, field application of manure using the proposed cropping pattern and land application area would maintain a field by field nutrient balance of 1.4 or less, and a whole farm nitrogen balance ratio of 1.65 or less. In order to maintain the nitrogen balance, a net 1,044,907 lbs/nitrogen would be exported off-

site through solid manure. Approximately 184,855 lbs/nitrogen would be imported to the site from commercial fertilizer.

Field application of phosphorus, potassium, and salts are calculated and managed under the Dairy General Order. Salt tolerance of crops and yield reductions can vary depending on various factors, such as irrigation management, the crop being grown, and the site conditions. While the General Order does not regulate a nutrient balance ratio for phosphorus, potassium, and salts, it does require that if monitoring indicates levels of these elements are causing adverse impacts, then application rates must be adjusted downward to prevent or correct the problem. The intent of regulatory requirements is to implement operational improvements and monitor groundwater quality to assess impacts. Long-term groundwater and soil monitoring would be used to determine the success of the program on a regular basis and determine the need for additional action. The California CV-SALTS control efforts will be used to assess impacts related to Nitrate, EC and other salt indicators in the future.

Despite attempts to apply pond wastewater at agronomic rates, groundwater quality beneath crop fields may be impacted with continued land application of nutrients, salts, and other constituents. As discussed above, the CVDRMP monitoring has found that shallow groundwater has been affected across the Central Valley due to historic or current dairy operations, especially beneath cropland. The NMP allows application of nitrogen at greater rates than the plant crops actually need, with a maximum of 1.4 times crop uptake. Additionally, imprecision and inefficiencies in wastewater application and variations in weather both can influence plant growth, and, thus, the uptake of nitrogen. For these reasons, over-application of nitrogen and other nutrients could occur. Also, applying manure with high organic nitrogen content may not meet a crop's nitrogen need during the most rapid growth stage, while exceeding the crop nitrogen uptake during the remainder of the crop's growing season, when the nitrogen may be subject to leaching (Bradford 2012). The existing on-site monitoring system would be used to assess future changes in water quality and to determine if further degradation occurs.

Chapters 18.64.050 D, E, F, G, H, J, K, M, N, O, P, Q, R, T, V, Z, AA, BB, CC, DD, EE, JJ, KK, LL, MM, NN, QQ; 18.64.060 A, B, C.8.d, D, E, F; and 18.64.070 A, D, E, G, H, I, K, L, M, P, Q, S, and T of the ACO apply to this potential effect (see Appendix C). For a discussion of potential secondary impacts of off-site disposal of solid manure from the project, see Impact HYD-7 below.

The proposed project as planned would be required to implement BMPs, and engineering, and design measures consistent with local and state regulations. The proposed dairy expansion is not anticipated to increase the potential for impacts to groundwater quality. Further, while small exceedances have been observed onsite, nearby water supply wells in the Planada CSD do not show any exceedances. However, because of the elevated nitrate levels from agricultural operations in general in the Central Valley, the following mitigation measures would be required to ensure implementation of regulatory measures. The CVRWQCB shall incorporate the following mitigation measures into the individual WDR permit requirements for the Hillcrest Dairy Expansion project.

Significance of Impact: Significant.

Mitigation Measure HYD-3a:

The following Best Management Practices shall be implemented as applicable:

1. Positive drainage shall be included in project design and construction to ensure that excessive ponding does not occur. The design shall comply with Title 3, Division 2, Chapter 1, Article 22, Section 646.1 of the Food and Agriculture Code for construction and maintenance of dairy or facility surroundings, corrals, and ramps, as described below.
2. Dirt or unpaved corrals, or unpaved lanes, shall not be located closer than 25 feet from the milking barn or closer than 50 feet from the milk house. Corral drainage must be provided.
3. A paved (concrete or equivalent) ramp or corral shall be provided to allow the animals to enter and leave the milking barn. This paved area shall be curbed (minimum of 6 inches high and 6 inches wide) and sloped to a drain. Cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. The perimeter of the area shall be constructed in a manner that will retain the wash water to a paved drained area. Paved access shall be provided to permanent feed racks, mangers, and water troughs. Water troughs shall be provided with: (1) a drain to carry the water from the corrals; and (2) pavement (concrete or equivalent) which is at least 10 feet wide at the drinking area.
4. The cow standing platform at permanent feed racks shall be paved with concrete or equivalent for at least 10 feet back of the stanchion line.
5. As unpaved areas are cleaned, depressions tend to form, allowing ponding and increased infiltration. Regular maintenance shall include filling of depressions. Personnel shall be taught the correct use of manure collection machines (wheel loaders or elevating scrapers).

Mitigation Measure HYD-3b:

The applicant shall comply with requirements of the NMP/WMP, implement CVRWQCB requirements included in the individual WDR for the proposed expansion, and with all Merced County ACO requirements not superseded by the conditions of the individual WDR.

Mitigation Measure HYD-3c:

As set forth in the NMP, proposed application rates of liquid and/or solid manure shall not exceed agronomic rates. Nutrient samples shall be collected prior to and during applications periods to confirm agronomic rates within all portions of cropped areas receiving manure, and to protect water supplies. Soil testing frequency for nitrogen, potassium, phosphorus, and salts are described in the NMP. Modifications to the NMP may be required as outlined in the individual WDR for the proposed expansion to be issued by the CVRWQCB.

Mitigation Measure HYD-3d:

The applicant shall comply with the permit requirements to protect surface waters and groundwater from salts in wastewater, to be issued by the CVRWQCB as set forth in Board Resolution R5-2018-0034. Since the dairy is a member of the Central Valley Dairy Representative Monitoring Program, and the CVDRMP has committed to participate in the Salt Control Program on behalf of its members, the applicant is not required to take further action to comply with the Salt Control Program.

Mitigation Measure HYD-3e:

While the Hillcrest Dairy has previously monitored water quality individual groundwater monitoring wells, the Hillcrest Dairy has become a member of a Groundwater Monitoring Coalition that monitors groundwater quality on a regional basis. As a condition of the individual WDR issued for the facility, the CVRWQCB may require the facility to contribute to a regional representative groundwater monitoring system to confirm water table gradients and water quality variations. Monitoring well requirements and a monitoring schedule shall be included in the WDR issued for the facility. The resulting groundwater monitoring objectives for either the regional program or individual site shall be used to assess and mitigate groundwater impacts.

Mitigation Measure HYD-3f:

Groundwater monitoring of the on-site domestic and irrigation wells as required under the General Order and individual WDR shall be completed by the dairy operator. If appropriate, surrounding properties with domestic water supply wells within 500 feet of the land application property could be considered for sampling for nitrate and E.C. at a minimum. A well monitoring schedule shall be incorporated into the WDR issued for the facility.

Mitigation Measure HYD-3g:

After project implementation and subsequent groundwater monitoring, if the dairy shows increased concentration in groundwater of constituents of concern, additional manure exportation, a reduction in herd size, or additional crop acres may be necessary to accommodate the proposed expansion. A new Report of Waste Discharge (ROWD) may be required by the CVRWQCB. The ROWD shall clearly demonstrate that the herd size will not constitute a threat to groundwater quality. If necessary, the CVRWQCB shall revise the WDR issued to the facility.

Mitigation Measure HYD-3h:

The Department of Community and Economic Development and the Division of Environmental Health shall make a final inspection of the facility prior to the commencement of expanded operations to confirm the dairy meets local and state requirements.

Mitigation Measure HYD-3i:

During construction, all soils that contain manure or process water residue shall be maintained on the project site.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure will be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: As stated above, the proposed dairy facility expansion would not increase the potential for impacts to groundwater quality. Mitigation Measures HYD-2a-i reinforce CVRWQCB requirements to quantify and evaluate water quality and determine necessary measures to remediate water quality conditions as required to meet water quality standards. It includes monitoring of the effectiveness of implemented measures, and modification or addition of measures if water quality problems persist. Compliance with applicable requirements would minimize project impacts to groundwater quality. A less-than-significant impact would result, and no additional mitigation would be necessary.

Implementation/Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Division of Environmental Health, Department of Community and Economic Development, and the CVRWQCB shall monitor for compliance. Implementation of HYD-3a and HYD-3b shall occur prior to issuance of a building permit and throughout ongoing operations. Implementation of HYD-3c, HYD-3e, HYD-3f, and HYD-3g shall occur throughout ongoing operations. Implementation of HYD-3d shall occur prior to final inspection or initiation of new operations, and throughout ongoing operations. Implementation of HYD-3h shall occur prior to final inspection or initiation of new operations. Implementation of HYD-3i shall occur during construction.

Impact HYD-4: Decrease groundwater supplies (Criterion X.b)

Implementation of the proposed project may result in the decrease of groundwater supplies since there would be a small increase in groundwater use with the proposed dairy expansion. However, because the majority of the water would be used for irrigation and would contribute to groundwater recharge, and water use at the Hillcrest Dairy would be considered efficient, this would be a less-than-significant impact.

Based on GSP and DWR water level records for monitoring wells in the vicinity, historical groundwater levels show a decline in groundwater elevations. Local groundwater trends over the 2016-2018 monitoring period demonstrate generally consistent upward trends during wet years, though groundwater levels within a few individual wells experienced a range of up to 20 feet of variation. Historically, the on-site monitoring wells have shown that water levels experience considerable seasonal drops during extraction, but generally recover between irrigation seasons. However, water levels in two of the onsite monitoring wells have been low or undetectable and have had insufficient water for analysis. As noted in the GSP, this general area of the aquifer region appears to have localized highs and depressions without a dominant lateral gradient, possibly due to pumping or stream influences (GSP 2019).

The Hillcrest Dairy Expansion would continue to rely on surface water (from MID canals), groundwater, and wastewater recycling for irrigation. No new irrigation wells are proposed as part of the dairy expansion project. With implementation of the proposed dairy expansion, there would be no change to the cropped acreage or crop types, and water application to the land application areas would remain the same under proposed conditions at approximately 1.77 billion gallons of water annually.

Dairy cows require large amounts of water daily. While 10 to 20 percent of the daily water requirements come from feed, lactating cows require anywhere from 25 to 40 gallons of drinking water per day. Severe water restriction can have a marked impact on productivity and feeding behavior of the herd (Harner, J. et. al. 2013). Therefore, for this analysis, daily drinking water needs of the herd are not considered from an efficiency standpoint. For the Hillcrest Dairy, drinking water for the dairy herd would continue to be derived from groundwater.

There is a significant amount of water used in the milking cycle. Water use in the milk parlor generally includes washing cow udders before milking, using sprinklers to keep cows cool in order to enhance milk production, cleaning holding pens and parlor areas, and washing milk lines and equipment. These actions are repeated with each milking cycle. There are several options for dairy farms to improve water use efficiency and conservation, depending on the farm operations and overall needs. By maintaining clean stalls and alleys and practicing good bedding management, the animals are cleaner and the need for udder rinsing is reduced. Additional best management practices in the milk parlor can include regular inspections of water hoses, scraping manure from the parlor floors before spraying, and using recycled water from the plate coolers or from the pipeline wash in the milk house (Castillo and Burrow 2008; Holmes and Struss 2009).

In a survey of 15 California dairies in the Central Valley in 1998 to 1999, milk parlor water use ranged from 45 to 194 gallons/cow/day (Castillo and Burrow 2008). A review of Arizona dairies estimated approximately 70 gallons/cow/day, not including drinking needs (Holmes and Struss 2009), while Texas data reported a range of 12.3 to 69.2 gallons/cow/day in the milk parlor

(University of Idaho 2016). The high variability of water use without adequate correlation with any particular dairy condition make it difficult to use a standardized value for analytical or regulatory purposes.

The wastewater generated²⁴ at the milkbarn and sent to the ponds at the Hillcrest Dairy is 77,511 gallons per day (approximately 28.29 million gallons per year) under existing conditions. With the proposed expansion, wastewater generated would increase to 87,021 gallons per day (approximately 31.76 million gallons per year). This equates to approximately 9.6 gallons/cow/day for existing conditions, and 8.9 gallons/cow/day for proposed conditions, which is well below the range of milk parlor water use noted above. This increase in milkbarn process water use is related to an increase in milk cows per string, bulk tank wash wastewater, and increased plate cooler volume. Recycled water is the source of sprinkler pen water.

While there would be an increase in wastewater generated, this wastewater would be used to irrigate the existing cropland²⁵. Therefore, the increase in water use at the dairy production area would result in a minor offset in irrigation deliveries at the cropland. In other words, there would be no net change in water required for irrigation, but the total irrigation demand provided from wastewater would increase from 6.6 percent to 6.9 percent of total water volume to with the proposed dairy expansion.

The Merced Groundwater Subbasin is identified by the California Department of Water Resources as critically overdrafted, and is considered a high priority groundwater basin. The Sustainable Groundwater Management Act (SGMA) of 2014 (as amended) allows customized groundwater sustainability plans (GSP) to be designed by groundwater sustainability agencies (GSA) to manage groundwater resources while being sensitive to local economic and environmental needs. The goal of SGMA is to have sustainably managed groundwater within 20 years of the initial GSP submittal and maintain sustainability for a 50-year planning and implementation horizon.

The *Merced Groundwater Subbasin Groundwater Sustainability Plan* was adopted in November 2019 and submitted to the California DWR by the January 31, 2020 deadline. However, the DWR found that the Merced Subbasin GSP does not satisfy the objectives of the SGMA nor substantially comply with the GSP Regulations, and revisions must be completed no later than July 27, 2022. The proposed project would be subject to the requirements of the GSP as adopted and revised in the future.

While the proposed dairy expansion would result in an increase in overall water use, water use at the Hillcrest Dairy would be considered relatively efficient. Further, the increased wastewater would be used for irrigation, which could result in groundwater recharge via irrigation percolation, and it is not anticipated that the dairy expansion project would affect the broader groundwater basin levels or overdraft conditions. In addition, the proposed dairy expansion would be subject to the requirements of the GSP for the region, as adopted and revised in the future, which would further minimize impacts to groundwater supplies. Therefore, impacts from groundwater depletion from this operation would be considered less than significant.

²⁴ This includes milkhous equipment and floor wash.

²⁵ As noted above, the proposed nutrient application rates meet required agronomic rates of 1.4 or less for best management farming practice mandated by the CVRWQCB.

Significance of Impact: Less than significant.

Mitigation Measure HYD-4: None required.

Impact HYD-5: Modification of surface water drainage patterns and an increase in runoff (Criteria X.c.ii, X.c.iii, and X.c.iv)

Implementation of the proposed dairy expansion project would not modify surface water drainage patterns, and would not cause localized off-site migration of runoff, erosion, and/or flooding since the expansion could require minimal grading over a previously disturbed area. Because all storm water generated by the project would be collected and maintained within the project proponent's larger property, this would be a less-than-significant impact.

Construction activities are proposed for the expansion project within the existing dairy facility footprint. The facility includes an existing irrigation and tailwater retention system for the land application areas that minimizes the potential for runoff. Stormwater runoff from impervious surfaces and roofed areas would continue to be routed to the wastewater pond, except for stormwater from the milking parlor, which is routed to a yard. Because stormwater generated by the project would be collected and maintained within the project proponent's larger property, no additional drainage would reach regional waterways as a result of the project. Run-on and runoff water would be prevented from entering or leaving the facility.

The project site is located within Flood Zone X, which is defined as an area with an annual flooding probability of 0.2 percent and is outside of the 100-year flood zone. Implementation of the project at this location would not impede or redirect flood flows since it would not be located within a floodway. Therefore, implementation of the proposed project would not impede or redirect flood flows, and a less-than-significant impact would result. No mitigation would be required.

Chapters 18.64.050 E and I of the ACO require that all wastewater or stormwater that has come into contact with manure be maintained on the project site, or applied to other sites only upon written approval of the landowner. Chapter 18.64.050 G requires notification of Merced County Division of Environmental Health for any off-site discharge of wastewater. Chapter 18.64.050 BB requires application of manure at agronomic rates. Additionally, Chapter 18.64.050 O requires a separation of at least 100 feet between waste application areas and any surface water feature. However, application of manure (liquid or dry) may be closer than 100 feet to a surface water body or irrigation well if adequate protection to the surface water body or irrigation well is provided. Chapter 18.64.070 M requires a separation of at least 50 feet between waste management ponds and settling basins and any public irrigation facilities, with a maintained drainage area between the two facilities. As noted in the DEH inspection, the Hillcrest Dairy is in substantial compliance with ACO requirements.

Under State regulations and according to the WMP, the Hillcrest Dairy has been designed to retain all facility wastewater generated, together with all precipitation on, and drainage through, manured areas during a 100-year, 24-hour storm event, including a 120-day storage period. All precipitation and surface drainage outside of manured areas would be diverted away from manured areas unless it would be fully retained (CCR Title 27, Division 2, Subdivision 1 22562(a)). On-going maintenance

inspections of the storage ponds as outlined in the WMP Operation and Maintenance Plan would ensure compliance with stormwater retention requirements.

The runoff from increased impervious surfaces outside of manured areas may be substantial during intense storm events. However, the annual rainfall for the project area is relatively low, and under normal circumstances, little runoff would be expected. Conformance with the County ACO requirements and individual WDR process would reduce surface drainage impacts associated with runoff from dairy facilities to a less than significant level. Additional regulatory requirements for the proposed dairy expansion may be included in the individual WDR issued by the CVRWQCB for the facility. Because all stormwater generated by the project would be collected and maintained within the project proponent's larger property, no adverse effects due to runoff would occur and no mitigation would be necessary.

Significance of Impact: Less than significant.

Mitigation Measure HYD-5: None required.

Impact HYD-6: Water supply pathways for pollutant migration (Criterion X.a)

Existing water supply wells on site and adjacent to the proposed dairy may represent preferred pathways for pollutant migration to groundwater. The project applicant has documented compliance with setback requirements or adequate well protection for on-site wells. This would be a less-than-significant impact.

Existing irrigation and water supply wells (either active or abandoned) in the site proximity that do not meet current well standards of construction may act as conduits for pollutant migration to the subsurface. If any of the wells were not constructed with effective sanitary seals upon construction, or have been damaged since installation, surface water may seep into the wells and the underlying aquifer, causing water quality degradation.

There are a total of 10 wells serving the Hillcrest Dairy, including three domestic/dairy wells on site and seven irrigation wells (for approximate location of the wells, see Figures 3-5, 3-6a, and 3-6b of Chapter 3, *Project Description*).

The Merced County ACO, together with the Merced County Well Ordinance, recognizes the importance of protecting water quality from the release of animal pathogens. Chapter 18.64.050 of the County Code establishes a minimum setback of 100 feet between any manured areas and water wells. However, application of manure (liquid or dry) may be closer than 100 feet to a surface water body or irrigation well if adequate protection to the surface water body or well is provided. As noted in the DEH inspection, the Hillcrest Dairy is in substantial compliance with ACO requirements.

The ACO requires that all wastewater be maintained on-site and discharged into the manure management system, and that wastewater does not create a nuisance or pollution condition (Chapter 18.64.050 E, K, LL). In the event of groundwater pollution, the project applicant must submit a plan to abate the groundwater impacts to the Merced County Division of Environmental Health (Chapter 18.64.050 T). In addition, the CVRWQCB requires that all process water that comes into contact

with wastewater be collected and stored in the ponds with low permeability liners, reducing the potential release of pathogens to water supplies.

Since all existing wells at the project site meet current Merced County standards for well protection as set forth above, and the Hillcrest Dairy would continue to be subject to ACO and Well Ordinance requirements, there would be no potential conduits for groundwater contamination associated with existing water wells. This would be a less-than-significant impact.

Significance of Impact: Less-than-significant impact.

Mitigation Measure HYD-6: None required.

Impact HYD-7: Impacts to water quality at off-site locations as a result of project operations (Criterion X.a)

Implementation of the proposed Hillcrest Dairy Expansion project would result in increased export of dry manure, associated pathogens, and residual contaminants to off-site locations, potentially causing impacts to water quality at off-site locations. This would be a significant impact.

The proposed dairy facility expansion would increase the number of cows from 8,050 to 9,750. The herd expansion would result in an overall increase in manure and associated pathogens produced at the project site. The manure could also contain residual amounts of contaminants such as hormones, antibiotics, or pesticides. Therefore, manure process water applied to fields may contain these pathogens and contaminants. For the potential impacts from pathogen transport and contamination of groundwater and water supply wells at the project site, see Impacts HYD-3 and HYD-6.

While implementation of the ACO, the General Order, and the Merced County Well Ordinance would minimize potential impacts from pathogen contamination on site, the proposed dairy facility expansion includes the increased export of manure generated from the facility. As reported in the NMP, approximately 19,998 tons of solid manure from the dairy facility is exported and applied to off-site agricultural operations. The total export of manure would increase to 33,198 tons with the proposed dairy expansion.

The Long-term Irrigated Lands Regulatory Program General Orders adopted by the RWQCB (see Regulatory Setting of this section) provide general WDRs to protect ground and/or surface waters for owners and operators of irrigated lands throughout the Central Valley who join an approved third-party group or coalition. The Individual Discharger General Order (Order R5-2013-0100) regulates waste discharges from irrigated lands for individuals that are not enrolled under WDRs administered by a third-party, or who are not covered by the Dairy General Order WDRs. All growers are required to submit farm information to either their coalition or the RWQCB. These include both a farm evaluation and a nitrogen management plan. The Farm Evaluation helps determine what farm practices are currently being implemented and whether any improvements can be made to protect water quality. A significant amount of adsorption²⁶ of nutrients to soil particles

²⁶ Not to be confused with absorption, adsorption is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface. Absorption is the process in which a fluid permeates or is dissolved by a liquid or solid.

and inactivation of pathogenic organisms would be expected to occur in the fields, and potential impacts to water quality at off-site fields receiving exported liquid and dry manure would be reduced. The growers are required to implement BMPs to protect surface water in areas where monitoring has identified problems.

As defined by the adopted Irrigated Lands Program General Orders (described above) and animal confinement facility WDRs, required surface and groundwater water monitoring and corrective actions conducted by water quality coalitions and individuals would reduce this potential impact to water quality at off-site fields. To ensure compliance with regulatory requirements, the following measure would be required.

Significance of Impact: Significant.

Mitigation Measure HYD-7:

Over the course of operations, the project sponsor shall obtain written agreement from the recipients of manure exported off site to require demonstrated compliance with the following:

- The recipient belongs to an approved third-party group or coalition compliant with the Long-term Irrigated Lands Regulatory Program General Orders adopted by the RWQCB, is covered by an Individual Discharger General Order, or is otherwise covered by Confined Animal Facility WDRs as adopted by the RWQCB.
- All manure shall be applied to cropland at rates and times that are reasonable for the crop, soil, climate, special local situations, and management system. Manure applications shall be timed and managed to minimize nitrogen movement below the root zone and to minimize percolation of waste constituents to groundwater.
- All stormwater that is or has been in contact with manure shall be maintained on site. No storm drainage that has been in contact with manure shall be allowed to flow or seep onto adjacent properties or public roads, or into any waterway.
- Where the commingling of water containing manure can take place with irrigation wells and irrigation and/or drainage district facilities, these facilities must be protected from pollution by a backflow device or method that is approved by the Division of Environmental Health and/or the appropriate irrigation/drainage district. It is the obligation of the property owner to install and maintain or cause to be installed and maintained the backflow device or method.
- Manure shall not be applied within 100 feet of any domestic well, irrigation well, or surface water body. Surface water bodies include creeks, streams, lakes and reservoirs, but do not include canals constructed above grade. Adequate protection of surface water bodies or irrigation wells shall prevent discharge or infiltration of manure constituents to the water body or well.
- The project sponsor shall provide the most recent analysis of the liquid or dry manure, in writing, to the manure recipient. The signed agreement between the project sponsor and the recipient of manure exported off site shall be submitted to the Merced County Division of Environmental Health for review.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located outside the project site. The construction of surface water protection, such as berms, or installation of well backflow protection at off-site locations would result in less-than-significant environmental effects.

Significance after Mitigation: Implementation of these measures would reduce the magnitude of this potential effect by requiring compliance with RWQCB requirements to minimize impacts to surface and ground water quality from manure applied to cropland off site. A less-than-significant impact would result, and no additional mitigation would be required.

Implementation/Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and Division of Environmental Health shall monitor for compliance. Mitigation Measure HYD-7 shall be implemented throughout ongoing operations.

Impact HYD-8: Potential selenium and heavy metals effects to on-site biological resources (Criteria IV.a/b)

The use of supplemented feeds at the proposed Hillcrest Dairy Expansion could result in the introduction of heavy metals into the environment by the application of dairy waste to on-site agricultural fields and retention ponds. If concentrations of metals in terrestrial or aquatic media are significantly higher than naturally occurring background levels, adverse effects to terrestrial or aquatic biota within the project area could occur. Compliance with Merced County ACO regulations would reduce this impact to less-than-significant levels.

Based on studies summarized by the Council for Agricultural Science and Technology and others, concentrations of selenium, the heavy metal of most concern in supplemented feeds, are unlikely to be elevated in terrestrial media following application of dairy waste to fields, even under repeated application (Merced County 2002). Therefore, no impacts to wildlife from direct exposure to terrestrial media within the project area are expected. Ullrey (1992) showed that supplementation of feeds with 0.3 parts per million (ppm) selenium (the amount approved by FDA in 1997) would result in less than 0.5 percent of the total input of selenium to the environment from other sources. Additionally, corn grown with and without the use of selenium-supplemented dairy waste as fertilizer showed no significant increase in selenium content.

Selenium could, however, leach from on-site soil and/or retention pond bottom sediments to groundwater. Depending on the amount and form of selenium present in soil or sediment within the project area, selenium could enter groundwater and be transported to surface water. Tailwater or water from tile drains could be directly discharged to surface water. It is assumed that this could result in the introduction of selenium into aquatic ecosystems. For the Hillcrest Dairy, all cropped fields receiving wastewater have tailwater return systems, and collected tailwater is recycled and returned to the top of field, returned to a tailwater pond for reuse, or drained through an adjacent field to the tailwater pond.

The Merced County ACO, together with the Merced County Well Ordinance, recognizes the importance of protecting water quality from the release of animal pathogens and agricultural chemicals or compounds. (The potential effects of contamination due to the export of manure pathogens to off-site agricultural fields as a result of project operations are evaluated in Impact HYD-7, above.) As described in the regulatory setting of this chapter, ACO Chapter 18.64.050, Sections E, K, O, T, LL, MM, and NN include requirements to protect water quality. Sections 18.64.060 D, E, F, and G contain provisions requiring testing of selenium in manure, soils, groundwater, and plant tissue. Section 18.64.050 T requires that operators of confined animal

facilities prevent further degradation if elevated levels of selenium are detected, and requires remediation of existing contamination. Sections 18.64.050 LL and MM require that potential sources of selenium contamination be treated in the facility waste management system or monitored if discharged to surface waters, including irrigation district facilities. Section 18.64.050 MM requires that any discharges to surface waters, including irrigation district facilities, meet the discharge and receiving water standards of the appropriate irrigation district and/or the CVRWQCB. Currently, the total selenium water quality objective for the San Joaquin River is 0.005 mg/l four-day average (CVRWQCB 2018). In summary, these measures include: management practices to prevent degradation; requirements for manure, soils, and groundwater testing; and in the event of contamination, remediation to meet receiving water standards by the RWQCB as set forth in the Basin Plan.

In addition, the CVRWQCB requires that all process water that comes into contact with wastewater be collected and stored in on-site settling basins and retention ponds with low permeability liners, reducing the potential release of pathogens and agricultural compounds in the project area to water supplies. (The text of these ACO provisions can be found in Appendix C.) Additional regulatory requirements for the Hillcrest Dairy Expansion may be included in the Individual WDRs issued by the CVRWQCB.

The regulatory requirements of the CVRWQCB and the ACO would minimize selenium exposure pathways within the project area and require the implementation of an on-site system for the monitoring and remediation of selenium in the environment. Implementation of Mitigation Measures HYD-3 and HYD-7 as set forth in in this chapter would further minimize this impact.

Significance of Impact: Less than significant.

Mitigation Measure HYD-8: None required.

Impact HYD-9: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan (Criterion X.e)

Implementation of the Hillcrest Dairy Expansion project would not conflict with or obstruct implementation of the General Order for Existing Milk Cow Dairies WDRs or the Merced Subbasin Groundwater Sustainability Plan. Therefore, this impact would be less than significant.

As stated above in the regulatory setting, the CVRWQCB Existing Milk Cow Dairies General Order implements the State laws and regulations relevant to confined animal facilities. Under the General Order, animal confinement facility operations are prohibited from discharging waste into surface water, or into groundwater that is directly connected to surface water. In compliance with the requirements of the CVRWQCB, the proponents of the Hillcrest Dairy have completed the required components of the General Order for the existing dairy, and would be required to obtain coverage under Individual WDRs for the proposed dairy expansion.

The Hillcrest Dairy is located in the Merced Groundwater Subbasin. The current Basin Plan for the Sacramento River and San Joaquin River Basins was issued in May 2018. As noted above, the proposed project would be required to implement a SWPPP during construction, and proposed project operations would not result in hazardous wastewater discharges. Therefore, the proposed

project would not include any waste discharges that could conflict with the Basin Plan. Further, agriculture and animal confinement facilities are designated as beneficial uses of water resources in the Basin Plan.

As described, above, the Merced Subbasin Groundwater Sustainability Agency worked with two other GSAs to develop a joint Groundwater Sustainability Plan for the Merced Groundwater Subbasin in order to implement the SGMA requirements and achieve the sustainability goals outlined in SGMA. While the Hillcrest Dairy Expansion would result in an increase in groundwater use, the majority of the water would be used for irrigation and would contribute to groundwater recharge, and the Hillcrest Dairy Expansion would be expected to follow the guidelines within the GSP, as applicable, to manage groundwater depletion.

Therefore, the project would not conflict with or obstruct the water quality control plan or a sustainable groundwater management plan, and the potential impacts would be less than significant. No mitigation would be required.

Significance of Impact: Less than significant.

Mitigation Measure HYD-9: None required.

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11 LAND USE COMPATIBILITY

This land use chapter provides an evaluation of land use compatibility for the proposed Hillcrest Dairy Expansion project. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), due to the proximity of off-site residences and the community of Planada to the project facilities, the proposed dairy expansion could be incompatible with existing land uses in the project vicinity. Additional potential land use effects have been previously evaluated in the project IS and will not be evaluated further in this chapter. (This less-than-significant impact is briefly summarized in Section 11.3 below.)

The following assessment provides a discussion of the relationship of the proposed project to the policies and procedures of the Merced County General Plan, the Merced County Animal Confinement Ordinance (ACO) (a chapter of the Merced County Zoning Code), and other provisions of the Merced County Zoning Code.

11.1 REGULATORY FRAMEWORK

11.1.1 LAND USE REGULATION

Merced County has implemented extensive regulation of land use for areas within its jurisdiction. This regulation generally occurs through the County's General Plan and Zoning Ordinance. Land use within the project area is currently regulated by Merced County through the various plans and ordinances adopted by the County.

MERCED COUNTY GENERAL PLAN AND ZONING ORDINANCE

The 2030 General Plan (Merced County 2013)¹ is a long-range, generalized planning policy document to guide development of the county over the next 20 years. The General Plan consists of a policy document and a series of land use and circulation maps and diagrams. The narrative policy document sets forth the adopted policies of the County regarding issues of public interest and regulation. Merced County's five guiding principles - agriculture, economic development, environmental quality, public facilities and services, and transportation - reflect a general community consensus about the key considerations of the General Plan. Topics addressed in the General Plan include goals, policies, and programs regarding: land use and community character; agriculture; transportation and circulation; housing; public facilities and services; natural resources; recreation and cultural resources; health and safety; air quality; and water resources.

The project site and the areas surrounding the site are designated Agricultural on the Merced County General Plan Land Use Diagram. As set forth in the 2030 Merced County General Plan, the Agricultural land use designation:

... provides for cultivated agricultural practices which rely on good soil quality, adequate water availability, and minimal slopes. This is the largest County land use

¹ The 2030 Merced County General Plan was adopted on December 10, 2013. The document is available at the Merced County Community and Economic Development Department or at: <<https://www.co.merced.ca.us/2018/Adopted-General-Plan>>

designation by area in the County and is typically applied to areas on the valley floor. (Merced County 2013)

The project site and the area surrounding the site are located within an area designated for A-1 (General Agricultural) uses by the Merced County Zoning Code. The purpose of the General Agriculture zone is to provide for areas of intensive farming operations dependent on higher quality soils, water availability, and relatively flat topography; and to host agricultural and/or industrial uses dependent on proximity to agricultural production or requiring a location in sparsely populated areas.

Animal confinement facilities such as dairies may be permitted in all agricultural zones within Merced County subject to approval of an Administrative Permit or Conditional Use Permit (CUP) as determined by the number of off-site dwellings within the windshed, and whether animal confinement facility criteria are met. Animal confinement facilities face greater regulatory scrutiny if greater than five off-site residential dwellings are located within the windshed, defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility, or if the animal confinement facility does not meet other locational criteria as defined by County Code Section 18.64.040 (B). For the Hillcrest Dairy Expansion project, there is one residence located within the windshed of the dairy (see Figure 3-4). Because of the proximity of farm labor housing facilities to the west and southwest, and the Planada community to the south, Merced County is considering the dairy project under its Conditional Use Permit process.

Within Merced County, Conditional Use Permits are discretionary permits that require special review and control to ensure that a use of land is compatible with the neighborhood and surrounding residences. Land uses subject to a CUP are considered more likely to have greater impacts than uses permitted by right, or uses permitted under Administrative Permits (Merced County Code Section 18.116.010 (B)). The proponents of the proposed Hillcrest Dairy Expansion project have made application to the County of Merced for a Conditional Use Permit (CUP20-013) to construct and operate the proposed dairy expansion.

Open Space Action Plan

The 2030 Merced County General Plan contains an Open Space Action Plan (OSAP). The Open Space Development Review System (OSDRS) is one of the primary implementing tools of the County's Open Space Action Plan. Through such a review system, daily planning and permit approval decisions should reflect and implement the adopted policies and development standards of the 2030 General Plan. The system is intended for utilization by developers in the design and building of projects, and by planners and decision makers in their review of projects for conformance with County policy. The system is fundamentally a process for assessing the appropriateness of proposed developments, including their compatibility with surrounding environmental constraints and resources. This system of review is required of all projects for which a building permit or other entitlement is necessary, such as a land division or use permit, as well as during policy and ordinance amendment. For project consistency with the OSDRS, see Table 11-2 in Section 11.3 of this chapter. Potential impacts to biological resources were evaluated in Chapter 6, *Biological Resources*, of this EIR.

Merced County Code and Animal Confinement Ordinance

Merced County's ACO acts to provide a comprehensive set of environmental compliance regulations affecting animal confinement facilities in Merced County. These regulations include several locational criteria to minimize land use conflicts with urban and sensitive land uses, and adjacent rural residences. To address these potential land use impacts, the EIR prepared for the ACO contains mitigation measures that require implementation of applicable chapters of the Merced County Code during environmental review of animal confinement facility projects such as the Hillcrest Dairy Expansion project.

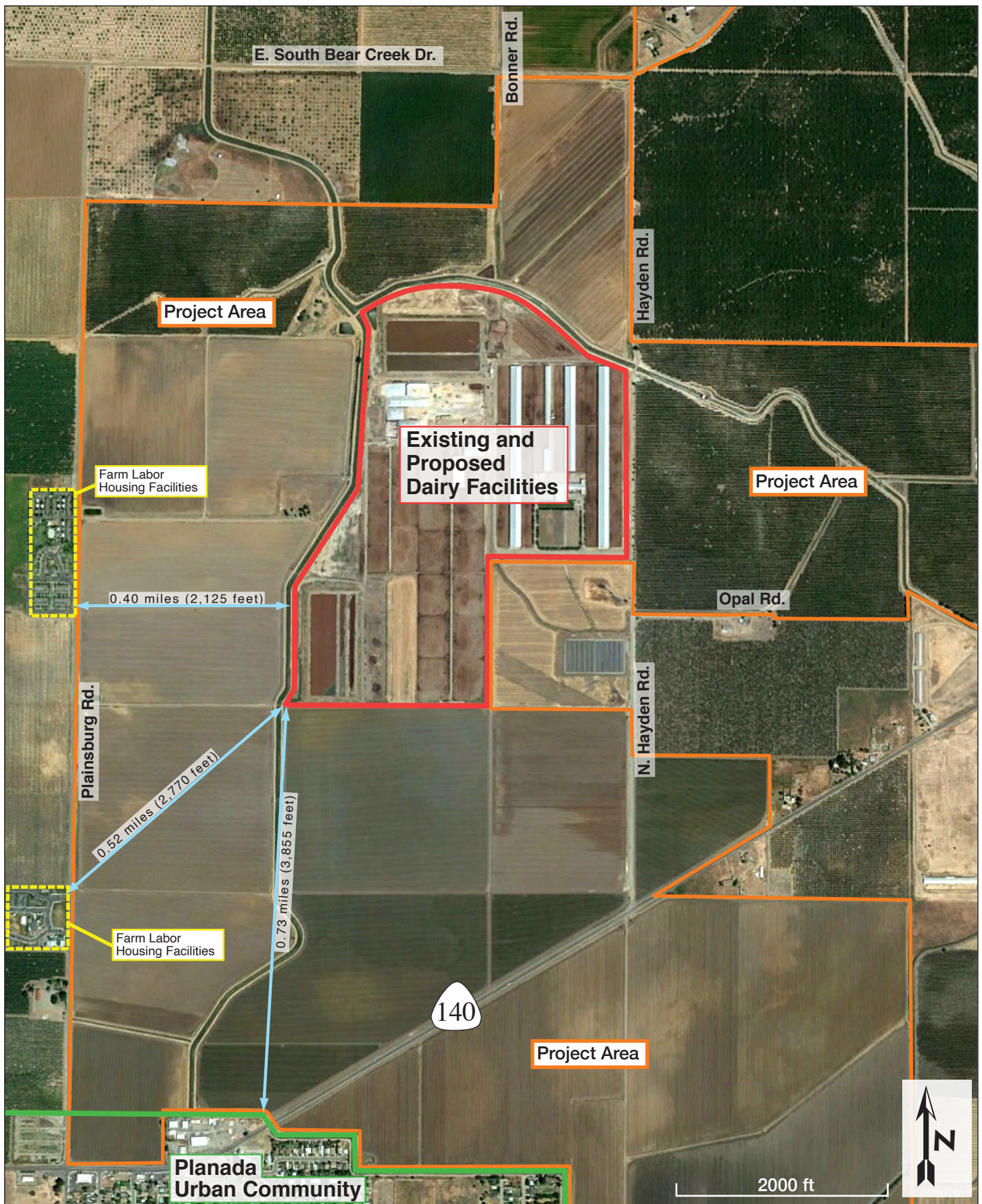
Chapter 18.64.040 (B)(1)(b) of the Merced County Code requires a setback of at least 1,000 feet between new active animal confinement facilities² and any off-site residences. For an existing facility such as the Hillcrest Dairy, if the separation distances are less for the uses or boundaries described in Chapter 18.64.040 (B)(1), modification or expansion of the facility may not decrease the existing separation distance unless the off-site property owner provides written permission (Merced County Code Chapter 18.64.040 (B)(2)). The setback distance is measured from the nearest point of active areas of the animal confinement facility to the nearest point of the residence. For the Hillcrest Dairy, there are no off-site residences within 1,000 feet of existing active dairy facilities.

The ACO prohibits new dairies within one-half mile of urban areas, areas zoned for residential uses, or concentrations of rural residences (Merced County Code Chapter 18.64.040 (B)(1)(a)). The ACO also protects sensitive uses such as schools, hospitals, jails, public parks, or any wildlife refuges from the nuisance effects of dairies by establishing a one-half mile setback from new dairies³. For an existing facility, modification or expansion of the dairy facility must not decrease the existing separation distance if it is less than one-half mile. The Hillcrest Dairy facility is situated approximately 0.73 miles north of the urban community of Planada. There are two farm labor housing facilities located in the vicinity of the Hillcrest Dairy along North Plainsburg Road, one located approximately 0.40 mile west of active dairy facilities and another located approximately 0.54 miles southwest of active dairy facilities (see Figure 11-1).

Table 11-3 in Section 11.3 of this chapter lists locational criteria contained in the ACO, and project compliance with these regulations. (For a complete listing of Merced County Regulations Pertaining to Dairies and Other Animal Confinement Facilities, see Appendix C.)

² According to the ACO, active animal confinement facilities include animal confinement areas and corrals, retention ponds and settling basins, milk barn, freestalls and other animal housing, feed storage, and mechanical separators.

³ 2030 Merced County General Plan Policies LU-4.7 and LU-1.13 prohibit rural commercial and industrial uses, secondary residences, and ancillary agricultural uses within a half-mile of either federal or State wildlife refuges, or managed wetlands within the Grasslands Ecological Area when it is determined by the County that there could be an unmitigated impact to natural resources or habitat. See Table 11-1 for a discussion of project consistency with these policies.



SOURCE: Planning Partners 2022

Hillcrest Dairy Expansion Project CUP20-013

Figure 11-1

Distance of the Planada Urban Community and Concentrations of Rural Residences to Existing and Proposed Active Dairy Facilities

11.2 ENVIRONMENTAL SETTING

11.2.1 PROJECT LOCATION AND SETTING

The existing Hillcrest Dairy is located in unincorporated Merced County, west of Hayden Road, and 0.75 miles north of Highway 140 in the Planada area (for additional project area information, see Chapter 3, *Project Description*). Adjacent existing land uses include several off-site single-family residences associated with other agricultural operations (see Figure 3-2 and Table 3-2). There is one off-site residence located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility) (see Figure 3-4 in Chapter 3, *Project Description*). The closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road, and there are farm labor housing facilities within 0.40 miles and 0.52 miles of the existing dairy (see Figure 11-1). The community of Planada is approximately 0.73 miles south of the Hillcrest Dairy facility. Project area cropland is immediately adjacent to Planada to the south and the farm labor housing facilities to the west.

11.2.2 MERCED COUNTY PERMITTING HISTORY

The dairy facility was originally constructed in 2002 under Merced County Administrative Permit (AA) 166. The AA 166 permit allowed for 2,050 milking cows plus support stock, to total 3,885 animal units⁴. CUP10-005 was issued in 2012 in order to bring the existing dairy facility in compliance with Merced County permit requirements in 2012 with 4,750 mature cows and 8,050 total animals. There is a Williamson Act Contract on file for the dairy site. To allow for the expansion of the dairy, the project sponsor has submitted an application for issuance of a new Conditional Use Permit (CUP20-013) from the County.

11.3 ENVIRONMENTAL EFFECTS

11.3.1 SIGNIFICANCE CRITERIA

As set forth in Appendix G to the State CEQA Guidelines, Section XI, *Land Use and Planning*, the following criteria have been established to quantify the impact of an adverse effect for evaluation pursuant to CEQA. A project would normally result in a significant impact if the project would:

- 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. (XI.b)

An additional land use assessment criterion previously evaluated in the project IS/NOP was whether the project would:

- Physically divide an established community. (XI.a)

This impact was found to be less than significant and will not be evaluated further in this chapter.

⁴ An animal unit is a standardized measure of agricultural animals. A 1,000-pound beef cow is the standard measure of an animal unit.

PROJECT CONSISTENCY WITH ADOPTED MERCED COUNTY PLANS AND POLICIES

The following discussion evaluates the consistency of the proposed Hillcrest Dairy Expansion project with Merced County policies. The policies of the 2030 Merced County General Plan, the consistency of the proposed dairy expansion project with those policies, and the reasoning for the conclusions are set forth in Table 11-1.

Because compliance or noncompliance with adopted plans and policies does not in itself result in a physical impact to the environment, no environmental impacts are identified in this analysis; rather, the evaluation concentrates on the proposed project's compliance with adopted Merced County policy. Where a policy regulates or sets standards for an aspect of the environment, for instance in setting flood proofing standards for areas subject to 100-year frequency floods, the impact is identified and evaluated in the appropriate topical section of this report, so that agency policies as environmental standards are used in evaluating specific environmental impacts.

Policy compliance is often a matter of interpretation. Unless their decision is appealed to the Board of Supervisors, the Merced County Planning Commission is the ultimate arbiter of public policy for this project, and their judgment regarding the project and a specific policy may be different from that set forth in this report. Thus, the following policy evaluation should be viewed as preliminary, with the ultimate decision to be made by the appropriate appointed and elected officials.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies		
Objective or Policy	Consistency	Discussion
Land Use Element		
Policy LU-1.13: Wetland Habitat Area Separation Do not allow rural commercial and industrial uses, secondary residences, and ancillary agricultural uses within a half mile of either State or Federal wildlife refuges, or managed wetlands within the Grasslands Ecological Area when it is determined by the County that there could be an unmitigated impact to natural resources or habitat.	Yes	There are no protected habitat areas, such as wildlife refuges or wildlife management areas, within two miles of the project site. The project site is well beyond the minimum one-half mile setback for these uses. The proposed project consists of an expansion of existing dairy facilities and does not include ancillary uses such as additional farm worker housing as described in Policy LU-2.4 below.
Policy LU-2.3: Land Use Activity Limitations Limit allowed land use within Agricultural and Foothill Pasture areas to agricultural crop production, farm support operations, and grazing and open space uses.	Yes	The existing and proposed dairy facility is an allowed use in the agricultural land use designation subject to approval of an Administrative Permit or Conditional Use Permit.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Policy LU-2.4: Secondary Uses in Agricultural Areas Except as otherwise provided by law, limit ancillary uses in Agricultural and Foothill Pasture areas to include secondary single-family residences, farm worker housing, agricultural tourism related uses, and agricultural support services, provided that such uses do not interfere with historic agricultural practices or result in adverse health risks, or conflict with sensitive habitats or other biological resources.	Yes	The existing uses at the project area include a dairy facility, associated cropland, and secondary single-family residences. The proposed project includes an expansion of the existing dairy within the footprint of the existing dairy facility.
Policy LU-2.7: Rural Energy Production Allow the development of ethanol production, co-generation, solar, and wind facilities in Agricultural and Foothill Pasture areas that produce renewable energy, support agricultural-related industries, and/or use agricultural waste, provided that such uses do not interfere with agricultural practices or conflict with sensitive habitats or other biological resources.	n/a	There is no renewable energy production included with the proposed dairy expansion. There is an existing solar system located south of the dairy site on North Hayden Road, which provides electrical power through PG&E to the Hillcrest Dairy. The proposed dairy expansion would not affect the existing solar facilities.
Policy LU-4.7: Wetland Habitat Area Separation Do not allow rural commercial and industrial uses, secondary residences, and ancillary agricultural uses within a half mile of either State or federal wildlife refuges, or managed wetlands within the Grasslands Ecological Area when it is determined by the County that there could be an unmitigated impact to natural resources or habitat.	Yes	See Policy LU-1.13 above.
Policy LU-10.12: Consultation with State and Federal Agencies, as follows: Continue to consult with applicable State and Federal regulatory agencies during project review and permitting activities.	Yes	The Notice of Preparation of an EIR for the Hillcrest Dairy Expansion project was filed with the Office of Planning and Research (OPR) on September 27, 2021. The NOP and Initial Study were circulated to the public, local and state agencies, and other interested parties to solicit comments on the proposed project. This Draft EIR similarly will be circulated for public review and comment.
Policy LU-10.14: Consultation with Grassland Resources Regional Working Group Consult with the Grasslands Resources Regional Working Group during project review and conservation planning efforts for projects within the boundaries of the Grasslands Focus Area.	n/a	Consultation as required by this policy is not necessary since the project site is located outside of the Grasslands Focus Area and the Grasslands Ecological Area boundary.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Agricultural Element		
Policy AG-3.1: Right-to-Farm Ordinance Continue to implement the Right-to-Farm Ordinance to define and limit instances where agricultural operations may be considered a nuisance to surrounding rural residential, residential or urban development.	Yes	The existing dairy is consistent with agricultural uses in the surrounding area. Mitigation measures have been included in this chapter to ensure land use compatibility of the expanded dairy with existing off-site residential uses.
Policy AG-3.9: New Confined Animal Facility Location Requirements Require new or expanded confined animal facilities to be located, at a minimum: <ol style="list-style-type: none"> One-half mile from any Rural Center or Urban Community boundary; residentially-designated or zoned property; sensitive uses such as schools, hospitals, jails, Federal wildlife areas, State wildlife areas, and public parks; or concentrations of five or more off-site residences. This does not include areas for municipal uses such as wastewater treatment facilities, airports, or solid waste recycling or disposal facilities located outside urban areas; and One thousand feet from any off-site residence, unless there is written permission from the off-site property owner. 	Yes	The proposed project would be compliant with setback provisions for the protection of the specified uses. There are no wildlife areas within the 0.5-mile setback distance. The Planada urban community boundary is located approximately 0.73 miles south of existing active dairy facilities, greater than the 0.5-mile required setback. There are no off-site residences located within 1,000 feet of the existing dairy facility. A farm labor housing facility 0.40 miles west of active dairy facilities would qualify as a concentration of rural residences. While some of the residences in the farm labor housing facility are located less than the one-half mile setback specified by the ACO, the proposed dairy expansion project would not decrease the distance of active dairy facilities to these residences (see Impact LU-1 and LU-2).
Transportation and Circulation Element		
Policy CIR-1.8: Private Roadway Improvements Require private roads and related improvements to be designed and installed to County standards as contained in the Improvement Standards and Specifications Manual (Title 16 of County Code) and Subdivision Code (Title 17), unless it can be demonstrated to the satisfaction of the approval authority that alternative improvements will be provided sufficient to fulfill the goals and objectives of this Chapter and the respective Codes.	n/a	No new private roads are proposed as part of the Hillcrest Dairy Expansion project. No modifications to any existing roadway are proposed either during project construction or operation.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Policy CIR-1.14: Required Structural Improvements Require developers of mining, large commercial, agricultural commercial, and industrial projects to either make appropriate roadway improvements and/or provide a funding mechanism for maintenance of the structural sections of County roadways when such projects could result in appreciable increases to commercial truck traffic and/or compromise the integrity of existing road sections.	Yes	The proposed dairy expansion would result in an increase from approximately 105.1 to 109.7 average daily trips, with an increase of 4.6 heavy truck trips per day. Based on the level of traffic increase, there are no roadway improvements or payments required by the Merced County Department of Public Works.
Policy CIR-1.15: Right-of-Way and Roadway Improvement Requirements Require right-of-way dedication and roadway improvements to offset project-related traffic and roadway impacts on all discretionary land use entitlement approvals.	Yes	See above.
Policy CIR-1.18: Right-of-Way Work Require encroachment permits for work within a right-of-way.	n/a	At this time, the proposed project would not require an Encroachment Permit since there is no work proposed within any public right-of-way.
Public Facilities and Services Element		
Policy PFS-7.10: Adequate Fire Flows for Agricultural Facilities Require all agricultural commercial facilities to have adequate water supply and fire flows to meet the Uniform Fire Code and other State and local ordinances.	Yes	As described in the IS/NOP, the Merced County Fire Department generally imposes requirements for on-site water storage for fire protection. Compliance with measures as set forth by the Fire Department would be required as conditions of approval and would reduce fire risk and hazard to levels found acceptable by the Merced County Fire Department.
Natural Resources Element		
Policy NR-1.7: Agricultural Practices Encourage agricultural, commercial, and industrial uses and other related activities to consult with environmental groups in order to minimize adverse effects to important or sensitive biological resources.	Yes	See response to Policy LU-10.12 above.
Policy NR-1.17: Agency Consultation Consult with private, local, State, and Federal agencies to assist in the protection of biological resources and prevention of degradation, encroachment, or loss of resources managed by these agencies.	Yes	See response to Policy LU-10.12 above.
Policy NR-2.9: Energy Conservation Encourage and maximize energy conservation and identification of alternative energy sources (e.g., wind or solar).	Yes	Operations at the Hillcrest Dairy would be considered energy efficient. Impact GHG-2 describes several energy efficiency upgrades that have been incorporated into existing operations.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Policy NR-3.1: Soil Protection Protect soil resources from erosion, contamination, and other effects that substantially reduce their value or lead to the creation of hazards.	Yes	Merced County's environmental procedures and standard conditions of approval include erosion control measures for both public and private development projects within the county. Additionally, the project will be required to comply with requirements of the General Permit for Discharges of Storm Water Associated with Construction Activity.
Policy NR-3.2: Soil Erosion and Contamination Require minimal disturbance of vegetation during construction to improve soil stability, reduce erosion, and improve stormwater quality.	Yes	See above.
Recreation and Cultural Resources Element		
Policy RCR-1.7: Agricultural Land Use Compatibility Consider agriculture as a compatible land use and appropriate buffer for public and private recreation areas.	n/a	There are no public or private recreation uses immediately adjacent to the project site or area.
Policy RCR-2.5: Human Remains Discovery Require that, in the event of the discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County Coroner and Native American Heritage Commission will be notified.	Yes	Chapter 7, <i>Cultural Resources and Tribal Cultural Resources</i> of this EIR includes mitigation that would require stopping work in the event of human remains discovery until the County coroner and Native American Heritage Commission (NAHC) are notified and appropriate action is taken.
Policy RCR-2.10: Tribal Consultation Consult with Native American tribes regarding proposed development projects and land use policy changes consistent with Planning and Zoning Law at Government Code Section 65351, and the OPR Tribal Consultation Guidelines (2005).	Yes	Chapter 7, <i>Cultural Resources and Tribal Cultural Resources</i> of this EIR, written notification and consultation with Native Americans was conducted during the Draft Program EIR preparation process for the 2030 General Plan Update. There were no responses received, and no sacred lands sites were identified as areas of concern with implementation of the 2030 General Plan. Lead agencies, such as Merced County, must consult with California Native American Tribes who are traditionally and culturally affiliated with the geographic area of the proposed project, and who have requested such notification or consultation in writing. As of the date of this Draft EIR (<i>Guerrero, pers. comm.</i> 2022), no tribes have requested notification or consultation with Merced County.
Health and Safety Element		
Policy HS-5.1: Compliance with Safety Standards Require that hazardous materials are used, stored, transported, and disposed of in a safe manner, in compliance with local, State, and Federal safety standards.	Yes	The on-site storage of any hazardous material over threshold quantities (55 gallons; 200 cu. ft.; or 500 pounds) would require a Hazardous Materials Business Plan (HMBP) to be filed with the Merced County DEH. As reported by DEH, the facility has a current HMBP.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Air Quality Element		
Policy AQ-1.3: Agricultural Operations Emission Reduction Strategies Promote greenhouse gas emission reductions by encouraging agricultural operators to use carbon efficient farming methods (e.g., no-till farming, crop rotation, cover cropping); install renewable energy technologies; protect grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to other uses; and develop energy-efficient structures.	Yes	The proposed dairy expansion includes maintaining the cultivation of cropland for the production of feed for the cows on site. As evaluated in Chapter 8, <i>Greenhouse Gas Emissions and Energy Use</i> , of this EIR, the dairy operations include several GHG emission reduction strategies (see Impact GHG-1). Operations at the Hillcrest Dairy would be considered energy efficient, and several energy efficiency features are used in agricultural operations (see Impact GHG-2).
Policy AQ-2.2: Development Review Process Use the development review process to achieve measurable reductions in criteria pollutant, toxic air contaminants, and greenhouse gas emissions.	Yes	As part of the development review process, this EIR evaluates air quality and greenhouse gas emission impacts of the proposed Hillcrest Dairy Expansion project (see Chapter 5, <i>Air Quality and Odors</i> , and Chapter 8, <i>Greenhouse Gas Emissions and Energy Use</i> , of this EIR) and includes mitigation measures to minimize impacts.
Policy AQ-2.3: Cumulative Impacts 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.	n/a	Potential project impacts due to both project specific and cumulative air quality effects have been determined to be significant and unavoidable. Air quality impacts of the proposed Hillcrest Dairy Expansion project are evaluated in Chapter 5, <i>Air Quality and Odors</i> , of this EIR, and mitigation measures are included to minimize impacts.
Policy AQ-2.4: Mitigation 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.	Yes	See above.
Policy AQ-2.5: Innovative Mitigation Measures Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties.	Yes	See above.
Policy AQ-2.7: Air District Best Performance Standards 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.	Yes	As part of the development review process, this EIR evaluates air quality of the proposed Hillcrest Dairy Expansion project and requires implementation of SJVAPCD Best Performance Standards, including compliance with Regulation VIII, the ATC/PTO permit process, and implementation of Best Available Control Technology to be developed during permit review (see Chapter 5, <i>Air Quality and Odors</i> , of this EIR).

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
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.	Yes	As discussed in Chapter 5, <i>Air Quality and Odors</i> , of this EIR, the project applicant would be required to comply with applicable SJVAPCD Rules and Regulations, including Regulation VIII, which specifies control measures for PM ₁₀ emissions from construction related activities, including demolition.
Policy AQ-6.8: Voluntary Emissions Reduction Agreement Require all project applicants, where project emissions have been evaluated to exceed SJVAPCD significance thresholds, to consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Support the SJVAPCD in its efforts to fund the Emission Reduction Incentive Program.	Yes	Chapter 5, <i>Air Quality and Odors</i> , of this EIR includes mitigation requiring the project applicant to consult with the SJVAPCD regarding a Voluntary Emissions Reduction Agreement (see Mitigation Measure AQ-3).
Water Element		
Policy W-2.4: Agricultural and Urban Practices to Minimize Water Contamination Encourage agriculture and urban practices to comply with the requirements of the Regional Water Quality Control Board for irrigated lands and confined animal facilities, which mandate agricultural practices that minimize erosion and the generation of contaminated runoff to ground or surface waters by providing assistance and incentives.	Yes	As discussed in Chapter 10, <i>Hydrology and Water Quality</i> , the existing dairy is subject to the requirements of the Central Valley Regional Water Quality Control Board General Order for Existing Milk Cow Dairies. The proposed expansion would require obtaining coverage under Individual Waste Discharge Requirements, which will include additional measures to minimize these effects.
Policy W-2.5: Septic Tank Regulation Enforce septic tank and onsite system regulations of the Regional Water Quality Control Board to protect the water quality of surface water bodies and groundwater quality.	Yes	The proposed dairy expansion would not involve the construction of any new septic systems or modification to any existing systems.
Policy W-2.6: Wellhead Protection Program Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.	Yes	As discussed in Impact HYD-7 in Chapter 10, <i>Hydrology and Water Quality</i> , existing wells at the project site meet current Merced County standards for well protection, and no mitigation would be required.

Table 11-1 Consistency of the Proposed Hillcrest Dairy Expansion Project with the 2030 Merced County General Plan Policies

Objective or Policy	Consistency	Discussion
Policy W-3.13: Agricultural Water Reuse Promote and facilitate using reclaimed wastewater for agricultural irrigation, in accordance with Title 22 and guidelines published by the State Department of Public Health.	Yes	Tailwater return used on land application fields are discussed in Chapter 10, <i>Hydrology and Water Quality</i> .

Source: Merced County, 2013; Planning Partners, 2022.

Table 11-2 includes an evaluation of project consistency with the Open Space Development Review System as set forth in the County's General Plan Open Space Action Plan.

Table 11-2 Consistency of the Proposed Hillcrest Dairy Expansion Project with the Merced County General Plan Open Space Development Review System

Question	Response	Discussion
1. Basic Land Use Category, Zone Code Consistency and Community Service Availability Determination	Yes	The proposed project is consistent with the Merced County Agricultural land use designation. The project is consistent with the General Agricultural zoning designation. As evaluated in the IS/NOP, the Hillcrest Dairy Expansion project impact to County services and facilities has been found to be less than significant.
2. Open Space Inventory Map and Data Base Review	Yes	Agriculture is considered an open space use. The proposed dairy expansion project would be a continuation of existing agricultural uses.
3. Demonstration by the permit applicant of consultation with the California Department of Fish and Wildlife, the Central Valley Regional Water Quality Control Board, the State Water Resources Control Board, the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and/or the Army Corps of Engineers, and any water purveyor serving the project area, as appropriate, to evaluate resources that could be affected by the proposed action; and proof of issuance of permits by these agencies, as required	Yes	Through development of the EIR and the CEQA process, consultation with applicable agencies has been conducted on behalf of the project applicant. Where mitigation measures have been suggested by resource agencies, they have been included in the EIR.
4. Environmental Determination	Yes	With issuance of the NOP, an environmental determination was made that the proposed project may have a significant effect on the environment, and an EIR is required. This Draft EIR represents the record of expanding upon the determination.

Table 11-2 Consistency of the Proposed Hillcrest Dairy Expansion Project with the Merced County General Plan Open Space Development Review System

Question	Response	Discussion
5. Land Use and Sensitive Resource Compatibility Determination	To be determined by the Planning Commission	The proposed project is located in an agricultural district in Merced County. Adjacent land uses include similar agricultural uses and crop production areas. The project would be consistent with the requirements of the Merced County Zoning Ordinance with implementation of mitigation measures. Impacts LU-1 and LU-2 of this chapter evaluates compatibility with nearby sensitive resources. These impacts were found to be less than significant, or less-than-significant following mitigation. The Merced County Planning Commission will make the ultimate compatibility finding.

Source: Merced County, 2013; Planning Partners, 2022.

Table 11-3 below lists locational criteria contained in the ACO, and project compliance with these regulations. (For a complete listing of Merced County Regulations Pertaining to Dairies and Other Animal Confinement Facilities, see Appendix C.)

Table 11-3 Consistency of the Proposed Hillcrest Dairy Expansion Project with the Locational Requirements of the Merced County Code

Requirement	Consistency	Discussion
Chapter 18.64.040 Locational Criteria		
B. Other Locational Criteria		
1. New Facilities		
a. The new facility shall be located more than one-half mile from the nearest boundary of the following: specific urban development plan, rural residential center, highway interchange center, or agricultural services center; residentially designated property in the general plan or residentially zoned property; sensitive uses such as schools, hospitals, jails, public or private recreational areas, parks, or all wildlife refuges; or concentrations of five or more off-site residences, provided that to qualify as a “concentration,” residences must be legally established, occupied, located within a contiguous area, and must equal or exceed a density of one dwelling unit per acre. Any of the previously mentioned urban boundaries shall not include areas for municipal uses such as wastewater treatment facilities, airports, or solid waste recycling or disposal facilities located outside urban areas.	n/a	The Hillcrest Dairy Expansion project involves the expansion of an existing dairy facility and not a new facility. See the consistency evaluation under Section 18.64.040 (B)(2) below.

Table 11-3 Consistency of the Proposed Hillcrest Dairy Expansion Project with the Locational Requirements of the Merced County Code

Requirement	Consistency	Discussion
b. The new facility shall be located at least 1,000 feet from any Federal wildlife area, State wildlife area, or off-site residence, except that any new facility may locate closer than 1,000 feet from an off-site residence with written permission from the off-site property owner(s). New goat facilities shall be located at least 500 feet from any off-site residences or Federal or State wildlife areas.	n/a	See above.
c. An application for a new facility or modification of an existing facility which has submitted a complete land use permit application to planning and community development shall be exempt from the setbacks in subparagraph (B)(1)(b) of this section from off-site residences, provided the new off-site single-family residence obtained the building permit after the facility submitted a complete application for a land use permit.	n/a	See above. All adjacent off-site residences are existing and previously permitted residences.
2. Existing Facilities. For an existing facility, if the separation distances are less for the uses or boundaries described in paragraph (B)(1) of this section, modification or expansion of the facility must not decrease the existing separation distance, except that expansion or modification of existing facilities may occur if the separation distance is less than 1,000 feet from an off-site residence and if the off-site property owner(s) provides written permission.	Yes	As described in Table 11-1 above, Policy AG-3.9, there is a farm labor housing facility within one-half mile of active dairy facilities. However, because the dairy modification would occur within the existing dairy footprint, distances to these residences would not be reduced.
3. Offsite Residences. New single-family residences not a part of an existing animal confinement facility are prohibited within 1,000 feet of an existing facility with any of the following exceptions. a. The animal facility owner gives written permission for locating the off-site residence closer than 1,000 feet; b. The existing residence is being remodeled; or c. The existing residence is replaced with another dwelling no closer than the existing separation distance.	n/a	There are no new single-family off-site residences included in the proposed project.

Source: Merced County, 2013; Planning Partners, 2022.

11.3.2 ENVIRONMENTAL IMPACTS

The following discussion examines the potential impact of the proposed project based on the impact thresholds criterion described above.

Impact LU-1: Consistency with Merced County Land Use Plans and policies adopted to protect the environment, including setback standards (Criterion XI.b)

As proposed, the Hillcrest Dairy Expansion project would be consistent with Merced County land use policies, including setback standards for animal confinement facilities. Because the proposed project would comply with land use regulations established by Merced County under the 2030 General Plan, ACO, and Zoning Code provisions, this would be considered a less-than-significant impact.

As indicated in Tables 11-1 and 11-2, the proposed Hillcrest Dairy Expansion project would be consistent with the policies and requirements of the Merced County General Plan and the Open Space Action Plan. Table 11-3 indicates that the proposed project would be consistent with the locational requirements of the Merced County Code (Chapter 18). These locational requirements are described in detail below.

The ACO (Merced County Code Chapter 18.64.040 (B)(1)(a)) and Merced County General Plan Policy AG-3.9 prohibit new dairies within one-half mile of urban areas, areas zoned for residential uses, or concentrations of rural residences. For an existing facility, modification or expansion of the dairy facility must not decrease the existing separation distance if it is less than one-half mile. The Hillcrest Dairy is situated approximately 0.73 miles (3,855 feet) north of the city of Planada, greater than the one-half mile setback (see Figure 11-1). There are two farm labor housing facilities located along North Plainsburg Road, which would qualify as a concentration of rural residences. The nearest farm labor housing facility is located approximately 0.40 mile west of active dairy facilities. While some of the residences in the farm labor housing facility are located less than the one-half mile setback specified by the ACO, the proposed dairy expansion project would not decrease the distance of active dairy facilities to these residences.

The ACO also protects sensitive uses such as schools, hospitals, jails, public or private recreational areas, parks, or all wildlife refuges from the nuisance effects of dairies by establishing a one-half mile setback from new dairies. For an existing facility, modification or expansion of the dairy facility must not decrease the existing separation distance if it is less than one-half mile. There are no protected habitat areas, such as wildlife refuges or wildlife management areas, within one-half mile of the project site.

Chapter 18.64.040 of the Merced County Code and Merced County General Plan Policy AG-3.9 require at least a 1,000-foot setback between animal confinement facilities such as the Hillcrest Dairy and off-site residences. The setback distance is measured from the nearest point of active areas of the animal confinement facility to the nearest point of the residence. For the Hillcrest Dairy, there are no off-site residences within 1,000 feet of existing dairy facilities; the closest off-site residence is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road (see Figure 3-7 in Chapter 3, *Project Description*). Because the proposed dairy modification would be constructed within the existing dairy footprint, distances to surrounding residences would not be reduced.

The ACO also prohibits new dairies within one-half mile of urban areas, areas zoned for residential uses, and concentrations of rural residences (Merced County Code Chapter 18.64.040 (B)(1)(a)). According to Merced County Code Chapter 18.64.040 (B)(2), if the animal confinement facility is located within the minimum setback distance, the modification or expansion of an existing facility must not decrease the existing separation distance from these areas. There are two farm labor housing facilities located in the vicinity of the Hillcrest Dairy along North Plainsburg Road. The nearest farm labor facility is located approximately 0.40 miles west of active dairy facilities; another farm labor housing facility is located approximately 0.52 miles southwest of active dairy facilities. While some of the residences in the farm labor housing facility are located less than the one-half mile setback specified by the ACO, because the proposed dairy modification would be constructed within the existing dairy footprint, the proposed dairy expansion project would not decrease the distance of active dairy facilities to these residences.

Because the proposed dairy expansion would meet Merced County setback requirements, this would be a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure LU-1: None required.

Impact LU-2: Land use compatibility with existing off-site residential uses adjacent to the project area (ACO)

Implementation of the proposed Hillcrest Dairy Expansion project could be incompatible with existing off-site residences due to the siting of active dairy facilities in close proximity to these uses. Because there have been previous nuisance odor complaints for the existing dairy, and because of the proximity of residences to existing and proposed active animal confinement facilities, there is an increased potential for land use conflicts, and this would be a significant impact.

The major land uses adjacent to the dairy facilities are agricultural and open space land uses. For the proposed Hillcrest Dairy, the closest off-site residence to existing active dairy facilities is located approximately 1,240 feet southeast of the active dairy facilities on Opal Road (see Figure 3-7). The nearest farm labor housing facility is located approximately 0.40 miles west of active dairy facilities, which would qualify as a concentration of rural residences. While the existing agricultural character of the vicinity would tend to minimize incompatibility to existing uses in the project vicinity, implementation of the dairy expansion project could introduce an additional source of odors, flies, and other insects in the area of these residences. (These potential adverse odor and nuisance insect effects are evaluated in Chapter 5, *Air Quality and Odors* and Chapter 9, *Nuisance Conditions from Insects* of this EIR.) The combination of these nuisance effects contributes on a cumulative level to determine land use compatibility with existing residents in the area.

Merced County regulates land use through the 2030 General Plan and Zoning Code. The EIR prepared for the Merced County ACO assessed potential land use conflicts with rural residences for new and expanding animal confinement facilities in Merced County. In efforts to minimize these conflicts and protect agricultural uses, the ACO requires a minimum setback between new or expanded animal confinement facilities and individual off-site rural residents to 1,000 feet, and generally prohibits the construction of new off-site dwellings within 1,000 feet of an existing animal

confinement facility, with some exceptions. According to Merced County Code Chapter 18.64.040 (B)(2), the modification or expansion of an existing facility must not decrease the existing separation distance from residentially zoned property, concentrations of five or more off-site residences, or off-site residences to less than 1,000 feet unless the off-site property owner provides written permission. While some of the residences in the farm labor housing facility are located less than the one-half mile setback specified by the ACO, the proposed dairy expansion project would not decrease the distance of active dairy facilities to these residences (see Figure 11-1).

Within unincorporated areas of the County, the regulatory definition of nuisances is the exclusive responsibility of Merced County. In certifying the EIR for the ACO and adopting modifications to the ACO, the Board of Supervisors found that the most appropriate land uses in agriculturally designated and zoned areas of the county were agricultural activities, including animal confinement facilities. The Board also found, given the prominent role of agriculture in the economy of the County, that agricultural uses should be protected from incompatible uses. In seeking to protect agricultural uses, the County has determined that a setback of 1,000 feet from isolated off-site rural residences and one-half mile from urban areas to active areas of an animal confinement facility (corrals, wastewater lagoons, and separation ponds) is sufficient to reduce potential nuisances to such uses to a level deemed acceptable by the County while protecting predominant agricultural uses. These setback requirements seem to be effective at minimizing the number of conflicts. Based on the environmental analyses prepared for dairy expansions in the County over the past ten years, only a small number of nuisance complaints have been recorded with the County regarding a few individual dairies (Personal Communications, DEH, 2012-2022).

In the past five years, DEH received several complaints from 2016 to 2019 regarding odors from the Hillcrest Dairy (Merced County 2022). DEH visited the site in response to odor complaints, but the condition could not be confirmed. Since 2019, there has been one additional odor complaint reported to DEH in May 2022. The odor complaint was not confirmed. The SJVAPCD also received odor complaints on the Hillcrest Dairy from the five-year period between 2017-2021 (SJVAPCD 2022), with the most complaints occurring in 2017 and 2019. In most instances, the complainant simply requested to log the complaint, and no inspection by the SJVAPCD was completed. In addition, comments from a nearby resident submitted on the Notice of Preparation for the project indicated a concern for increased odors generated by the Hillcrest Dairy.

In response to the history of odor complaints, the project applicant has completed an Odor and Vector Control Plan in place to minimize the potential for generation of odors and nuisance insects from proposed operations. These plans include housekeeping and management measures to further reduce flies, and implementation of best management practices to control odors. As described above, the existing dairy is consistent with surrounding agricultural uses and meets Merced County setback conditions for expanding dairies. Occasional odors at a dairy facility and associated farmland would be considered normal as recognized by the County's Right-to-Farm Ordinance, even with implementation of best management practices. However, the Hillcrest Dairy is the only dairy located in the area surrounding Planada, which could result in increased sensitivity of the surrounding community to intermittent odors from these operations.

Because there have been previous nuisance odor complaints for the existing dairy, and because of the proximity of residences to existing and proposed active animal confinement facilities, there is an increased potential for land use conflicts, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure LU-2a:

Implement the odor control measures set forth in Mitigation Measures AQ-7a and AQ-7b.

Mitigation Measure LU-2b:

Implement the nuisance control measures set forth in Mitigation Measure HAZ-1.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5 to 11 of this EIR.

Significance after Mitigation: Implementation of the foregoing measures would reduce the magnitude of this potential effect by requiring housekeeping and management measures to minimize nuisance insect and odor conditions. While there may be a potential for nuisance conditions with the dairy expansion, the proposed expansion would not reduce the setback distances specified by the ACO, and with implementation of the above mitigation measures, the potential impacts related to land use incompatibility with existing off-site residences would be reduced to less than significant.

Implementation/Monitoring: The Merced County Community and Economic Development Department and Division of Environmental Health shall monitor for compliance. Mitigation Measure LU-2a (AQ-7a and AQ-7b) shall be implemented prior to issuance of a building permit, and throughout ongoing operations. Mitigation LU-2b shall be implemented: prior to issuance of a building permit and throughout ongoing operations (MM HAZ-1).

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12 REQUIRED CEQA ANALYSES

12.1 CUMULATIVE IMPACTS

The California Environmental Quality Act (CEQA) Guidelines require that all Environmental Impact Reports (EIR) contain an analysis of cumulative impacts to which the project might contribute. An EIR must discuss the “cumulative impact” of a project when its incremental effect would be cumulatively considerable. State CEQA Guidelines Section 15355 defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact “consists of an impact which is created as a result of the combination of the project evaluated in the EIR, together with other projects causing related impacts” [CEQA Guidelines Section 15130(a)(1)]. The discussion of cumulative impacts “shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone” [CEQA Guidelines Section 15130(b)]. By requiring an evaluation of cumulative impacts, CEQA attempts to minimize the possibility that an EIR will overlook large-scale environmental impacts by only focusing on the effects of a single project.

Further, the CEQA Guidelines state that “[l]ead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used” [Section 15130(b)(3)]. The cumulative impacts analysis “shall examine reasonable, feasible options for mitigating or avoiding the project’s contribution to any significant cumulative effects” [CEQA Guidelines Section 15130(b)(5)]. With some projects, “the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis” [CEQA Guidelines Section 15130(c)].

CEQA Guidelines Section 15130(a)(3) also states that an EIR may determine that a project’s contribution to a significant cumulative impact would be rendered less than cumulatively considerable, and thus not significant, if a project is required to implement or fund its fair share of a mitigation measure(s) designed to alleviate the cumulative impact.

CEQA requires that one of two methods of establishing a future baseline be used:

1. A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or
2. A summary of projections contained in an adopted General Plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency (CEQA Guidelines, Section 15130 (b)(1)).

For the cumulative analysis for the Hillcrest Dairy Expansion project, the projections used were described and evaluated in the Program Environmental Impact Report for the Merced County Animal Confinement Ordinance Revision (ACO EIR), certified by Merced County on October 22, 2002. The ACO EIR evaluated cumulative effects for new and expanding animal confinement facilities in Merced County using a list-based approach in addition to a forecast of the future dairy herd based on the size of the then-existing herd and growth factors at the time of analysis (ACO EIR 2002). The ACO EIR cumulative analysis included an estimated herd for Merced County and

the San Joaquin Valley in 2001, in addition to an expected dairy herd forecast for 2003, 2005, and 2010. While the Hillcrest Dairy Expansion project is obviously well outside of the 2010 herd forecast timeframe, herd growth in Merced County and the San Joaquin Valley has not matched numbers projected in the ACO EIR. Due to feed costs increasing and with milk prices at record low levels in 2008 and 2009, many dairy operators found little to no profit margin and the industry growth stagnated. Table 12-1 includes the ACO EIR 2001 estimated herd and the dairy herd forecast for 2003, 2005, and 2010, in addition to the more recent 2017¹ estimated herd for the San Joaquin Valley (USDA 2017).

Table 12-1 San Joaquin Valley Cumulative Dairy Herd - Number of Head

Year	Total Herd	Milk Cows	Dry Cows	Heifers >2years	Heifers 1-2 years	Calves	Baby Calves
2001 ^{(a)(b)}	3,042,253	1,441,826	216,274	461,384	230,692	576,730	115,346
2003 ^(c)	3,101,445	1,469,879	220,482	470,361	235,181	587,952	117,590
2005 ^(c)	3,392,981	1,608,048	241,207	514,575	257,288	643,219	128,643
2010 ^(c)	4,289,314	2,032,850	304,928	650,512	325,256	813,141	162,628
2017 ^(d)	3,210,682	1,521,650	228,248	486,928	243,464	608,660	121,732

Sources and Notes:

- (a) California Department of Agriculture (CDFA), Division of Marketing Services, Dairy Marketing Branch, 2001, California Dairy Statistics 2000, Table 4. The CDFA provides milk cow numbers for San Joaquin Valley counties in the cumulative herd.
- (b) The total dairy herd is estimated based on the number of mature milking cows. The support stock is extrapolated from mature milking cow numbers.
- (c) Cumulative herd numbers for the years 2003, 2005, and 2010 were estimated in the ACO EIR cumulative analysis. Cumulative dairies forecast includes existing, approved, and pending dairies, including estimates for several counties based on foreseeable growth rates at the time.
- (d) United States Department of Agriculture (USDA), National Agricultural Statistics Service, 2017 Census Volume 1, Chapter 2: County Level Data: California. Table 11.

As shown in Table 12-1 above, the 2017 estimated herd count of 3,210,682 cows in the San Joaquin Valley is somewhere between the ACO EIR 2003 and 2005 herd forecasts of 3,101,445 and 3,392,981 cows, respectively. Since the current estimated herd is well within ACO EIR cumulative herd forecast, the ACO EIR analysis of cumulative effects for new and expanding animal confinement facilities in Merced County is still applicable and relevant. Therefore, the cumulative impact analysis for this EIR will incorporate the analysis contained in the ACO EIR as summarized below and as modified to reflect current environmental conditions in the county.

12.1.1 DEFINITION OF GEOGRAPHIC SCOPE OF CUMULATIVE IMPACTS ANALYSIS

Cumulative analyses included in the ACO EIR are assessed based on an understanding of projected growth or specific projects within a defined geographical area. The extent of the area evaluated varies depending on which environmental issue is being assessed. For example, because hydrologic effects in one watershed would be unrelated to those in another, the cumulative assessment area for surface and groundwater hydrology is defined as the San Joaquin River watershed. In contrast, the area addressed in the air quality evaluation is the San Joaquin Valley Air Basin. The geographic area

¹ The 2017 Census of Agriculture is the most recent year available from the USDA. The 2022 Census of Agriculture will be the next complete count of U.S. farms and ranches, as it is taken only once every five years.

of each cumulative effect is set forth in the summary of potential cumulative effects in Section 12.1.3 below.

12.1.2 TIERING FROM THE CUMULATIVE IMPACTS ANALYSIS OF THE ACO EIR

“Tiering” refers to the relationship between a program-level EIR (where long-range programmatic cumulative impacts are the focus of the environmental analysis) and subsequent environmental analyses such as this subject document, which focus primarily on issues unique to a smaller project within the larger program or plan. Through tiering a subsequent environmental analysis can incorporate, by reference, discussion that summarizes general environmental data found in the program EIR that establishes cumulative impacts and mitigation measures, the planning context, and/or the regulatory background. These broad-based issues need not be reevaluated subsequently, having been previously identified and evaluated at the program stage.

In the case of the Hillcrest Dairy Expansion project, the cumulative analysis for this EIR is tiered from the ACO EIR (Merced County 2002) as discussed in Chapter 1, *Introduction*, of this EIR.

12.1.3 SUMMARY OF THE CUMULATIVE IMPACTS ANALYSIS OF THE ACO EIR

The ACO EIR presents an assessment of the cumulative impacts associated with the construction and operation of animal confinement facilities in Merced County. Because the Hillcrest Dairy Expansion project is within the forecasted herd contained in the ACO EIR, the potential cumulative impacts identified by the ACO EIR for new and expanding animal confinement facilities would apply. Environmental issue areas listed below are assessed for cumulative impacts. Where applicable, ACO EIR mitigation measures adopted to reduce the magnitude of potential cumulative effects that apply to the Hillcrest Dairy Expansion project are listed. For the text of the adopted ACO EIR mitigation measures, see Appendix I, *ACO Final EIR - Summary of Impacts and Mitigation Measures*.

Aesthetics: As identified in the ACO EIR, the geography for cumulative effects to aesthetics is Merced County. The ACO EIR found that the following cumulative significant effect for aesthetics would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Generation of substantial light and glare

Merced County adopted Mitigation Measure AES-2 for this cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project. With adoption of this mitigation measure, the cumulative impacts to aesthetics in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because the aesthetic effects of the Hillcrest Dairy Expansion project would be less than significant as determined in the Initial Study/Notice of Preparation (IS/NOP) (see Appendix A, *Notice of Preparation and Initial Study*) for the project, construction and operation of the proposed dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on aesthetics would be less than significant.

Agricultural Resources: As identified in the ACO EIR, the geography for cumulative effects to agricultural resources is Merced County. No significant cumulative impacts were identified in the ACO EIR; the cumulative impacts to agricultural resources in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county. Because the agricultural resource effects of the Hillcrest Dairy Expansion project would be less than significant as identified in the IS/NOP for the project, construction and operation of the proposed dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on agricultural resources would be less than significant.

Air Quality and Greenhouse Gas Emissions: The geography for cumulative effects to air quality is the San Joaquin Valley Air Basin. The ACO EIR found that the following cumulative impacts to air quality and greenhouse gas emissions would be significant and unavoidable within the San Joaquin Valley Air Basin.

- Fugitive dust emissions from construction activities
- Ozone precursor emissions from dairy operations, farm equipment, and increased traffic
- PM₁₀ emissions from fugitive dust during project operations
- Ammonia and hydrogen sulfide emissions from animal confinement facility operations
- Greenhouse gas emissions from animal confinement facility operations
- Adverse odor from project operations

The ACO EIR found that the following significant cumulative impact to air quality would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Exhaust emissions (ROG, NO_x, CO, and PM₁₀) related to construction activities

Merced County adopted Mitigation Measures AQ-1 through AQ-8 for the foregoing cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts to air quality in the San Joaquin County Air Basin would be considered significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

The project level-impact of implementing the Hillcrest Dairy Expansion project from ozone precursors (VOC and NO_x) would exceed the SJVAPCD significance thresholds. Because of the magnitude of emissions from the project and pollutant concentrations in the San Joaquin Valley Air Basin, and because the Air Basin is in nonattainment for both federal and state ozone standards, the project's contribution to this effect would be cumulatively considerable. Thus, the cumulative impact of the Hillcrest Dairy Expansion on air quality would be significant and unavoidable.

Cumulative impacts due to GHG emissions are discussed in in this EIR under Impact GHG-1 in Chapter 8, *Greenhouse Gas Emissions and Energy Use*. The proposed project would exceed established significance thresholds for GHG emissions, and cumulative impacts due to GHG emissions were determined to be significant and unavoidable.

Mitigation measures identified within the Hillcrest Dairy Expansion project EIR would reduce potential impacts due to odors to a less-than-significant level, and there would be no cumulatively

considerable contribution to cumulative odor effects. Thus, the cumulative impact of the Hillcrest Dairy Expansion due to odors would be less than significant.

Biological Resources: The geography for cumulative effects to biological resources is the San Joaquin Valley. The ACO EIR found that the following cumulative impact to biological resources would be significant and unavoidable within the San Joaquin Valley:

- Loss and/or degradation of riparian habitat

The ACO EIR found that the following significant cumulative impacts to biological resources would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Loss of special status species
- Loss of wildlife habitat
- Loss and/or modification to wetlands
- Interference with the activities of night-active wildlife and/or animal movement/migration patterns
- Potential selenium and heavy metal effects to biological resources

Merced County adopted Mitigation Measures BIO-1 through BIO-7 for the foregoing cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts to riparian habitat in the San Joaquin Valley would be considered significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because mitigation measures identified within the Hillcrest Dairy Expansion project EIR would reduce potential impacts to loss of biological resources to a less-than-significant level, and there is no riparian habitat on the project site, impacts to biological resources were determined to be less than significant, and there would be no cumulatively considerable contribution to cumulative biological resources effects. Thus, the cumulative impact of the Hillcrest Dairy Expansion on biological resources would be less than significant.

Cultural Resources: As identified in the ACO EIR, the geography for cumulative effects to cultural resources is Merced County. The ACO EIR found that the following cumulative significant effect for cultural resources would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Possible disturbance of known and unknown prehistoric and/or historic resources

Merced County adopted Mitigation Measure CUL-1 for this cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project, as applicable. Impacts to cultural resources are isolated incidents that are project-specific, and generally do not contribute to a cumulative condition. Therefore, the cumulative impacts to cultural resources in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because mitigation measures identified within the Hillcrest Dairy Expansion EIR would reduce potential impacts from the loss of unknown cultural resources, including tribal cultural resources, to

a less-than-significant level, impacts to cultural resources were determined to be less than significant, and construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on cultural resources would be less than significant.

Geological Resources: As identified in the ACO EIR, the geography for cumulative effects from geologic hazards is Merced County. The ACO EIR found that the following cumulative significant effects for geological resources would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Construction stormwater quality
- Embankment failure leading to erosion and slope failure
- Seismic damage due to seismic shaking

Merced County adopted Mitigation Measures GEO-1 through GEO-3 for these cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts to geological resources in Merced County would be considered less than significant after mitigation as identified in the ACO EIR and as modified to reflect current environmental conditions in the county. Because the geological resource effects of the Hillcrest Dairy Expansion project would be less than significant as determined in the IS/NOP for the project, construction and operation of the proposed dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on geological resources would be less than significant.

For an evaluation of cumulative effects due to water quality during construction, see the discussion in Hydrology and Water Quality, below.

Hazards: As identified in the ACO EIR, the geography for cumulative effects from hazards is Merced County. The ACO EIR found that the following cumulative significant effects for hazards would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Nuisance mosquitoes
- Nuisance flies
- Manure pathogens
- Residual manure at closed facilities

Merced County adopted Mitigation Measures HAZ-1 through HAZ-4 for these cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts from hazards in Merced County would be considered less than significant after mitigation as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because mitigation measures identified within the Hillcrest Dairy Expansion EIR would reduce potential impacts due to nuisance insects (hazards) to a less-than-significant level, impacts due to hazards were determined to be less than significant, and there would be no cumulatively

considerable contribution to cumulative effects due to hazards. Thus, the cumulative impact of the Hillcrest Dairy Expansion due to hazards would be less than significant.

For an evaluation of cumulative effects from manure pathogens, see Hydrology and Water Quality below.

Hydrology and Water Quality: As identified in the ACO EIR, the geography for cumulative effects to hydrology is the San Joaquin River Watershed. The ACO EIR found that the following cumulative significant effect for hydrology and water quality would be significant and unavoidable within the San Joaquin River Watershed:

- Development in the zone of high sensitivity to groundwater contamination

The ACO EIR also found that the following significant cumulative impact to hydrology and water quality would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Modification of surface water drainage patterns
- Increase in runoff
- Exposure to flood risks
- Water supply well pathways for pollutant migration

Merced County adopted Mitigation Measures WQ-1 through WQ-6 for the foregoing cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project, as applicable. The cumulative effects due to the degradation of groundwater resources in the San Joaquin River Watershed would be considered significant and unavoidable as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

With implementation of water quality mitigation measures, project-level groundwater quality effects of the Hillcrest Dairy Expansion were determined to be less than significant. However, operation of the Hillcrest Dairy Expansion would continue to contribute to the cumulative effects due to the degradation of groundwater resources in the San Joaquin River Watershed, and the proposed project would make a cumulatively considerable contribution to these significant and unavoidable effects. Thus, the cumulative impact of the Hillcrest Dairy Expansion on groundwater quality would be significant and unavoidable.

Land Use: As identified in the ACO EIR, the geography for cumulative effects to land use is Merced County. The ACO EIR found that the following cumulative impact for land use would be significant and unavoidable within Merced County:

- Land use conflicts with rural residences

The ACO EIR found that the following significant cumulative impacts for land use would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Conversion of cultivated land to confined animal facilities
- Land use conflicts with urban and sensitive land uses

Merced County adopted Mitigation Measures LU-2 and LU-3 for the foregoing cumulative impacts as set forth in the ACO EIR, and has applied the measures to the Hillcrest Dairy Expansion project,

as applicable. Adverse effects to existing rural residences adjacent to existing animal confinement facilities were identified as significant and unavoidable as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Adverse effects to existing rural residences adjacent to the Hillcrest Dairy Expansion project were determined to be less than significant following implementation of mitigation measures identified in the Hillcrest Dairy Expansion project EIR. Because the land use effects of the Hillcrest Dairy Expansion project would be less than significant, construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project to land use would be less than significant.

Mineral Resources: As identified in the ACO EIR, the geography for cumulative effects to mineral resources is Merced County. The ACO EIR found that the following cumulative significant effect for mineral resources would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Loss of mineral resources

Merced County adopted Mitigation Measure MIN-1 for the foregoing cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts to mineral resources in Merced County would be considered less than significant with mitigation as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because the mineral resource effects of the Hillcrest Dairy Expansion project would be less than significant as determined in the IS/NOP, construction and operation of the proposed dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on mineral resources would be less than significant.

Noise: As identified in the ACO EIR, the geography for cumulative effects to the noise environment is Merced County. The ACO EIR found that the following cumulative significant effect for noise would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Creation of excessive noise levels

Merced County adopted Mitigation Measure NSE-1 for this cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project, as applicable. The cumulative impacts to the noise environment in Merced County would be considered less than significant with mitigation as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

The cumulative impact to the noise environment in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county. Because the noise effects of the Hillcrest Dairy Expansion project would be less than significant as determined in the IS/NOP for the project, construction and operation of the proposed dairy expansion would not make a cumulatively considerable contribution to this less-

than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on noise would be less than significant.

Population and Housing: As identified in the ACO EIR, the geography for cumulative effects to population and housing is Merced County. No significant cumulative impacts were identified in the ACO EIR; the cumulative impacts to population and housing in Merced County would be considered less than significant as identified in the ACO and as modified to reflect current environmental conditions in the county. Because the population and housing effects of the Hillcrest Dairy Expansion project would be less than significant as identified in the IS/NOP for the project, construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on population and housing would be less than significant.

Public Services: As identified in the ACO EIR, the geography for cumulative effects to public services is Merced County. No significant cumulative impacts were identified in the ACO EIR; the cumulative impacts to public services in Merced County would be considered less than significant as identified in the ACO and as modified to reflect current environmental conditions in the county. Because the public services effects of the Hillcrest Dairy Expansion project would be less than significant as identified in the IS/NOP for the project, construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on public services would be less than significant.

Recreation: As identified in the ACO EIR, the geography for cumulative effects to recreation resources is Merced County. No significant cumulative impacts were identified in the ACO EIR; the cumulative impacts to recreation resources in Merced County would be considered less than significant as identified in the ACO and as modified to reflect current environmental conditions in the county. Because the recreation resources effects of the Hillcrest Dairy Expansion project would be less than significant as identified in the IS/NOP for the project, construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on recreation resources would be less than significant.

Transportation and Circulation: As identified in the ACO EIR, the geography for cumulative effects to transportation and circulation is the San Joaquin Valley. The ACO EIR found that the following cumulative significant effect for transportation and circulation would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Addition of traffic on area roadways and high-weight vehicles on rural roads

Merced County adopted Mitigation Measure TRF-1 for this cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project, as applicable. With adoption of this mitigation measure, the cumulative impacts to traffic and roadways in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because the transportation and circulation effects of the Hillcrest Dairy Expansion project would be less than significant as determined in the IS/NOP for the project, construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this less-than-significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion on transportation and circulation would be less than significant.

Utilities and Service Systems: As identified in the ACO EIR, the geography for cumulative effects to utilities and service systems is Merced County. The ACO EIR found that the following cumulative significant effects for utilities and service systems would be considered less than significant with the implementation of mitigation measures identified in the ACO EIR:

- Interference with irrigation district facilities

Merced County adopted Mitigation Measure PF-2 for this cumulative impact as set forth in the ACO EIR, and has applied the measure to the Hillcrest Dairy Expansion project, as applicable. With adoption of this mitigation measure, the cumulative impacts to utilities and service systems in Merced County would be considered less than significant as identified in the ACO EIR and as modified to reflect current environmental conditions in the county.

Because the utilities and services effects of the Hillcrest Dairy Expansion project would be less than significant as identified in the IS/NOP for the project, the construction and operation of the dairy expansion would not make a cumulatively considerable contribution to this significant cumulative effect. Thus, the cumulative impact of the Hillcrest Dairy Expansion project on utilities and services would be less than significant.

12.2 GROWTH INDUCEMENT AND SECONDARY EFFECTS

CEQA Guidelines Section 15126.2(d) requires that an EIR identify any growth-inducing impacts that may result from a project. The CEQA Guidelines define a growth-inducing impact as:

...the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth... It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Induced growth as defined in this section of CEQA includes the direct employment, population, or housing growth of a project as well as the secondary or indirect growth accompanying direct growth. New employees from commercial development and new population from residential development represent direct growth, and induce additional economic activity in a given area from the increase in aggregate spending generated as purchases of goods and services. New employment also adds to the demand for local housing, although since all employees employed in a given community will not necessarily live in that community, this housing demand increase will tend to be less than the increase in employment. A project can induce growth by lowering or removing infrastructure barriers to growth, improving transportation access to an area, introducing a new use into an area, or by creating an amenity such as tourist-oriented facilities that attract new population or economic activity.

12.2.1 DIRECT GROWTH

Implementation of the Hillcrest Dairy Expansion project would not result in any direct growth inducement. The dairy currently employs a staff of approximately 50 workers, with approximately 30-35 employees on site at any one time. With implementation of the proposed project, the number of employees would remain at 50 workers. No new residences would be constructed on site. The existing workforce within Merced County (116,800 workers, of whom 8.3 percent, or 9,700 people, were unemployed in March 2022) could accommodate additional labor needs for construction or operation of the project without requiring the importation of large numbers of workers (EDD 2022). Similarly, any additional housing demands caused by future project employees could be accommodated by existing and planned housing resources within Merced County.

12.2.2 INFRASTRUCTURE BARRIERS TO GROWTH

A project could be expected to induce growth by removing an infrastructure barrier to growth. Infrastructure barriers can be both physical (e.g., lack of a road for access or sufficient sewage treatment capacity), or they can be institutional (e.g., the lack of some regulatory condition or capacity to allow development to occur).

The proposed Hillcrest Dairy Expansion project is located in an active agricultural district. Because animal confinement facilities do not require additional public facilities beyond those typically provided in agricultural areas, the animal confinement operations themselves would not be expected to increase the demand for public facilities beyond the levels provided and planned for by public utilities. The project is not growth inducing from the perspective of adding new infrastructure because no new infrastructure that could induce growth is proposed or required by the proposed project. The Hillcrest Dairy Expansion is currently served by some services and infrastructure, and would not result in the need for any major new systems or substantial alterations to these utility systems (see Appendix A, *Notice of Preparation and Initial Study*). Thus, implementation of the Hillcrest Dairy Expansion project would not serve to reduce an infrastructure barrier to growth.

12.2.3 INSTITUTIONAL BARRIERS TO GROWTH

The proposed project could also result in induced growth if it removed a policy or political (institutional) barrier to urban growth. The following discussion qualitatively evaluates this impact.

The proposed dairy project is consistent with Merced County land use plans, and does not include any changes in zoning or land use designations that would directly or indirectly increase the potential for growth. Therefore, the Hillcrest Dairy Expansion project would not induce growth beyond that which has been anticipated in Merced County planning documents.

12.3 EFFECTS FOUND NOT TO BE SIGNIFICANT

On the basis of the Notice of Preparation (NOP) for the Hillcrest Dairy Expansion project, in addition to comments received on the NOP, it was determined that the following environmental issues did not need to be evaluated in this EIR:

- Aesthetics;
- Agriculture and Forestry Resources;
- Geology;
- Hazards/Hazardous Materials;
- Mineral Resources;
- Noise;
- Population and Housing;
- Public Services;
- Recreation;
- Transportation/Traffic;
- Utilities and Service Systems;
- Wildfire.

As allowed for by State CEQA Guidelines Section 15128, the reasons for this determination are contained in the Initial Study for the Hillcrest Dairy Expansion project that is included in Appendix A, *Notice of Preparation and Initial Study*, of this document.

The following potentially significant effects were found not to be significant or less than significant after mitigation as evaluated in this EIR:

- Construction-related emissions
- Carbon monoxide emissions from operational equipment and increased traffic
- PM₁₀ and PM_{2.5} emissions from fugitive dust during project operations
- Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations
- Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants
- Adverse odor from project operations
- Conflict with or obstruct implementation of the applicable air quality plan
- Nest disturbance for Swainson's hawk
- Disruption to nesting activities of sensitive and migratory bird species
- Disruption to nesting activities for tricolored blackbird
- Cause a substantial adverse change in the significance of an archaeological resource
- Result in the accidental discovery and disturbance of human remains
- Cause a substantial adverse change in the significance of a tribal cultural resource
- Wasteful or inefficient consumption of energy

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency
- Increased fly production and related nuisance effects
- Create significant nuisance conditions due to increased mosquito production
- Degradation of water quality due to storm water runoff during project construction
- Degradation of surface water quality from operation of the Hillcrest Dairy Expansion
- Groundwater contamination from operation of the Hillcrest Dairy Expansion
- Decrease groundwater supplies
- Modification of surface water drainage patterns and an increase in runoff
- Water supply pathways for pollutant migration
- Impacts to water quality at off-site locations as a result of project operations
- Potential selenium and heavy metals effects to on-site biological resources
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan
- Consistency with Merced County Land Use Plans and policies adopted to protect the environment, including setback standards
- Land use compatibility with existing off-site residential uses adjacent to the project area
- Growth Inducement and Secondary Effects
- Irreversible Commitment of Resources
- Potential Environmental Damage from Accidents

The project's contribution to the following significant cumulative effects was found to be not cumulatively considerable with implementation of mitigation as evaluated in this EIR:

- Cumulative impacts to aesthetics
- Cumulative impacts to agricultural resources
- Cumulative impacts to biological resources
- Cumulative impacts to cultural resources
- Cumulative impacts to geological resources
- Cumulative impacts to hazards
- Cumulative impacts to land use
- Cumulative impacts to mineral resources
- Cumulative noise impacts
- Cumulative impacts to population and housing
- Cumulative impacts to public services
- Cumulative impacts to recreation
- Cumulative transportation and circulation effects
- Cumulative impacts to utilities and service systems

12.4 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL EFFECTS

The significant unavoidable environmental effects of the proposed project are as follows:

- Ozone precursor emissions from dairy operations, farm equipment, and increased traffic
- Cumulative air quality impacts
- Cumulative impacts due to GHG emissions
- Cumulative hydrology and water quality impacts

Merced County is unable to mitigate any of these potentially significant adverse environmental impacts to a less-than-significant level; all of the adverse impacts of the proposed project identified above would remain significant and unavoidable.

12.5 SIGNIFICANT IRREVERSIBLE CHANGES

CEQA Guidelines Section 15126.2 requires the evaluation of significant irreversible environmental changes, stating that “uses of nonrenewable resources during the initial and continued phases of a proposed project may be irreversible since a large commitment of these resources makes removal or nonuse thereafter unlikely.” This section of the EIR evaluates whether the project would result in the irretrievable commitment of resources, or would cause irreversible changes in the environment. Also, this section identifies any irreversible damage that could result from environmental accidents associated with the proposed project.

12.5.1 IRREVERSIBLE COMMITMENT OF RESOURCES

Implementation of the proposed project would result in the expansion of an existing dairy facility; it would also require both direct and indirect expenditures of energy. Indirect energy would be consumed by the use of construction materials for the project (e.g., energy resource exploration, power generation, mining and refining of raw materials into construction materials used, including placement). Direct energy impacts would result from the total fuel consumed in vehicle propulsion (e.g., construction vehicles, heavy equipment, and other vehicles using the facility). Additional energy resource demands would be used for the heating and cooling of buildings, transportation of people and goods, and lighting and other associated energy needs.

Construction and operation of the proposed project would contribute to the incremental depletion of resources, including renewable and non-renewable resources. Resources such as lumber and other forest products are generally considered renewable resources and would be replenished over the lifetime of the project. For example, lumber supplies are increased as seedlings mature into trees. Therefore, the development of the project would not result in the irreversible commitment of renewable resources. Nevertheless, there would be an incremental increase in the demand for these resources over the life of the project.

Non-renewable resources, such as natural gas, petroleum products, asphalt, petrochemical construction materials, steel, copper and other metals, and sand and gravel are considered to be commodities that are available in a finite supply. The processes that created these resources occur over a long period of time. Therefore, the replacement of these resources would not occur over the life of the project. To varying degrees, these materials are all readily available and some materials, such as asphalt or sand and gravel, are abundant. Other commodities, such as metals, natural gas,

and petroleum products, are also readily available, but they are finite in supply given the length of time required by natural processes to create them.

The demand for all such resources is expected to increase regardless of whether or not the project is developed. As discussed in the ACO EIR, the number of dairy facilities in the San Joaquin Valley is expected to increase under the cumulative herd forecast. Therefore, if not consumed by this project, these resources would likely be committed to other projects in the region intended to meet this anticipated growth. The investment of additional resources in the project would be typical of the level of investment normally required for dairies of this scale. Mitigation measures have been included in this EIR to reduce and minimize impacts to renewable and non-renewable resources.

12.5.2 IRREVERSIBLE ENVIRONMENTAL CHANGES

Irreversible long-term environmental changes associated with the proposed project are evaluated in Chapters 5 to 11 of this EIR. These irreversible environmental changes would include an increase in operational air emissions and greenhouse gases, among other impacts. Design features have been incorporated into the proposed project and mitigation measures have been included in this EIR to minimize the effects of the environmental changes associated with the development of the project. The project would result in significant and unavoidable impacts to air quality, as listed above in Section 12.4, *Significant Unavoidable Environmental Effects*.

12.5.3 POTENTIAL ENVIRONMENTAL DAMAGE FROM ACCIDENTS

Potential impacts and irreversible damage that could result from environmental accidents associated with the project have been previously evaluated in Section VII, *Hazards* in the IS/NOP (see Appendix A). The project proposes no uniquely hazardous uses, and its operation would not be expected to cause environmental accidents that would affect other areas.

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13.1 INTRODUCTION

Section 15126.6 of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) describe and comparatively evaluate a range of reasonable alternatives to a project, or location of the project, that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the project's significant effects. Thus, the range of alternatives evaluated in the following analysis is dictated by the range of project significant impacts identified in this EIR. Evaluated alternatives are limited to those that would reduce or eliminate identified environmental impacts.

This EIR identified 16 significant impacts that would occur with implementation of the proposed Hillcrest Dairy Expansion project, including:

- construction-related emissions;
- the generation of ozone precursor emissions;
- adverse odor from project operations;
- nest disturbance for Swainson's hawk;
- disruption to nesting activities of sensitive and migratory bird species;
- disruption to nesting activities for tricolored blackbird;
- substantial adverse change in the significance of an archaeological resource;
- accidental discovery and disturbance of human remains;
- increased fly production and related nuisance effects;
- degradation of water quality during construction;
- groundwater contamination from dairy expansion operations;
- impacts to water quality at off-site locations that receive manure;
- land use compatibility with existing off-site residential uses adjacent to the project;
- cumulative impacts to air quality;
- cumulative impacts to hydrology and water quality;
- cumulative impacts due to greenhouse gas emissions.

The environmental analysis concluded that all significant impacts could be reduced to a less-than-significant level with implementation of mitigation measures outlined in the EIR, except for impacts from ozone precursor emissions, and a significant contribution to cumulative air quality, greenhouse gas emissions¹, and water quality impacts. These impacts would remain significant and unavoidable. Accordingly, three alternatives, in addition to the required No Project alternative, were formulated to illustrate the range of project alternatives that could be implemented as an alternative to the proposed Hillcrest Dairy Expansion project.

¹ Impacts due to GHG emissions are considered a cumulative impact, since the project would result in a cumulatively considerable contribution to this impact.

This chapter also summarizes the alternatives considered but rejected, and evaluates the environmental impacts of the No Project Alternative, the On-Site Anaerobic Digester Alternative, the Dairy Digester Cluster Alternative, and the Reduced Herd Size Alternative. CEQA does not require the environmental review of alternatives to be at the same level of detail as that for the proposed project [CEQA Guidelines Section 15126.6(d)]. The review must be at a sufficient level, however, to allow for a meaningful comparison of the environmental merits of each.

To provide this meaningful comparison, Table 13-7 (shown at the end of this chapter) summarily compares the identified alternatives. The alternatives, as well as their comparative merits, are described below.

13.1.1 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

In accordance with CEQA Guidelines Section 15126.6(f), several alternatives were considered for the Hillcrest Dairy Expansion project, but rejected as infeasible.

ALTERNATIVE SITES OUTSIDE THE SAN JOAQUIN VALLEY

The alternative involving the relocation of dairy facilities to alternative sites outside the San Joaquin Valley was also eliminated, despite the fact that siting outside of the San Joaquin Valley Air Basin might speculatively lessen the incremental effect of air emissions and potential air quality cumulative effects. However, because these properties would be outside the jurisdiction of the County; the project applicant does not own, or cannot reasonably acquire an additional dairy site outside of the San Joaquin Valley; and relocation of existing facilities would be costly, this alternative was considered infeasible and rejected from further analysis.

ORGANIC DAIRY FARM MANAGEMENT ALTERNATIVE

Under the Organic Dairy Farm Management Alternative, the existing Hillcrest Dairy would implement operational improvements and an expanded herd as included in the project description, but would implement an alternative management system by conversion to an organic dairy. The Organic Dairy Farm Management Alternative would reduce impacts from greenhouse gases and minimize potential environmental impacts from pesticides and antibiotics. Organic farms rely heavily on pasture for at least several months every year, and the key environmental benefits of the Organic Dairy Farm Management Alternative are linked to grazing. Greenhouse gas emissions for grazing operations are minimized by: reducing the loss of manure methane during storage, since a portion of the manure would be deposited in pasture; indirectly reducing reliance on corn in feed rations; and soil sequestration of carbon within pastures.

In order to be certified as an organic dairy, the United States Department of Agriculture's (USDA) National Organic Program requires that animals must be able to obtain at least 30 percent of their daily feed intake from pasture during the grazing season, and all animals over six months of age must have daily access to pasture during the grazing season (USDA 2012). A University of Missouri Extension paper on pasture-based dairies found that the acreage required to adequately pasture cows ranged from 0.3 acres per cow to 3 acres per cow (Horner, J. and R. Milhollin 2012). With the proposed expansion, there would be approximately 9,000 cows over six months of age needing pasture. Therefore, based on the USDA study survey, the proposed dairy under an organic dairy management scenario could require from 2,700 to 27,000 acres of pasture. Since the cows must have

daily access to pasture during the grazing season, the pasture needs to be located where the cows are at the dairy site. However, the applicant does not own sufficient acreage of adjacent pasture, and the project vicinity has limited agricultural land availability (Trulia.com 2022). Based on the potentially large amount of acreage required for pasture and the lack of available agricultural real estate in the project vicinity, the project applicant cannot reasonably acquire additional land adjacent to the dairy for pasture.

In addition, current federal farm policies could make organic farming difficult to implement. The USDA's National Organic Program certification of a farming operation can be a complicated process in which the farm must go through a three-year transition period where they manage their farm as if already certified organic. The pasture and cropland providing feed for organic dairies during the three-year transitional phase may not be labeled or marketed as organic, and the farmer would not see a return on the initial investment for several years. Current standards also require the dairy herd to be fed 100 percent organic feed and to be provided organic health care for 12 months before being certified. Grazing is required for all animals over six months of age, with a required amount of feed from pasture of at least a 30 percent dry matter intake for the entire grazing season. As a result, organic operations must undergo three years of higher costs before the higher organic milk prices are received. In addition, detailed production records must be kept for five years post-certification for a farm to be in compliance with the regulations, and access to these records must be provided to USDA and its certifying agents (USDA 2012).

According to a study by the USDA, certification paperwork and compliance costs were reported by 40 percent of producers surveyed as the most challenging aspect of organic milk production, followed by finding new organic input sources (dairy replacement and feed), higher costs of production, and maintaining animal health (since antibiotics cannot be routinely administered). The volume of organic inputs needed on large farms in the West may account for the level of concern with sourcing inputs. Access to pasture for dairy feed also had a strong influence on whether a dairy becomes organic (USDA 2009). The study also found that larger organic dairies could reduce production costs due to economies of size; however, the additional costs of complying with pasture requirements and securing organic inputs in large volume may limit the cost advantages of larger organic operations (USDA 2009).

Based on the potentially large amount of acreage required for pasture and the lack of available agricultural real estate in the project vicinity, the project applicant cannot reasonably acquire additional land. In addition, current federal farm policies could make organic farming difficult to implement. For each and every reason identified above, this alternative was considered infeasible and rejected from further analysis.

SOLID-SCRAPE MANURE MANAGEMENT ALTERNATIVE

Under the Solid-Scrape Manure Management Alternative, the existing dairy would be modified from a flush water lagoon system to a solid-scraper dry manure management system. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the Solid-Scrape Manure Management. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Short-Lived Climate Pollutant Strategy (SLCP) (2017) proposed actions for the methane reductions from the dairy sector.

Dairy methane emissions may be significantly reduced by switching from flush water lagoon systems (anaerobic bacterial breakdown) to solid-scrape or dry manure management practices (aerobic bacterial breakdown). The use of manure management systems such as vacuum or scrape would allow for easier transport of manure off site to centralized digester systems, or to localized storage for onsite digesters. Scrape systems are probably best used by dairies that are land constrained, or those that wish to expand their herd without expanding their land footprint, and therefore need to export their manure in order to be in compliance with the General Order (ARB 2017).

In many cases, converting to scrape systems at dairies may not yet be cost-effective. Many California dairies operate flush systems because they tend to have lower labor and operating costs, require less frequent maintenance of floors, and allow for the distribution of nutrients onto fields with lagoon water. For large dairy facilities, flush systems save on manual labor since it is easier to move liquid around to multiple barns by hydraulics rather than manually transporting solid manure to extensive farm areas (Sustainable Conservation 2015).

Using dry or scrape-based manure management systems at existing dairies would reduce methane emissions by keeping manure out of lagoons, but depending on conditions, solid manure management practices could lead to increased emissions of PM₁₀, ammonia, nitrous oxide, and volatile organic compounds (VOC). The feasibility and indirect implications of switching to solid-scrape manure management is currently being explored by the ARB (ARB 2017). In 2018, the Dairy and Livestock Greenhouse Gas Emissions Working Group developed recommendations to advance methane emissions reductions at California dairy and livestock operations. Among these recommendations, the Working Group proposed additional research into whole-farm emissions changes related to non-digester practices to reduce GHG emissions, such as converting to scrape systems (ARB 2018).

The ARBs SLCP Strategy lays out a range of options to accelerate SLCP emission reductions in California, including regulations, incentives, and other market-supporting activities. As stated in the Strategy, California can cut methane emissions by 40 percent below current levels in 2030 by capturing or altogether avoiding methane from manure at dairies, meeting national industry targets for reducing methane emissions from enteric fermentation, effectively eliminating disposal of organics in landfills, and reducing fugitive methane emissions by 40-45 percent from all sources. California will aim to reduce methane emissions from dairy manure management by at least 20 percent in 2020, 50 percent in 2025, and 75 percent in 2030. To accomplish this, the State will encourage and support near-term actions by dairies to reduce emissions through market support and financial incentives. At the same time, ARB will initiate a rulemaking process to develop regulations for dairy manure management in California (ARB 2017).

More data is needed regarding the overall emissions impacts of conversion from flush- to scrape-based manure management systems, in addition to water use impacts and economics. Switching from one manure management practice to another could result in both increased and decreased impacts across the environmental spectrum (Sustainable Conservation 2015).

In summary, while dairy methane emissions may be significantly reduced under this alternative, converting to scrape systems at dairies may not yet be cost-effective, and solid manure management practices could lead to increased emissions of PM₁₀, ammonia, nitrous oxide, and VOCs. Further, additional data and supporting regulations are needed before switching to solid-scrape manure

management. For each and every reason identified, this alternative was considered infeasible and rejected from further analysis.

13.1.2 EVALUATION OF ALTERNATIVES

ALTERNATIVE 1 - NO PROJECT ALTERNATIVE

CEQA Guidelines require discussion of the “No Project” alternative to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project [CEQA Guidelines Section 15126.6(e)]. Under the No Project Alternative, construction of the Hillcrest Dairy Expansion would not occur. The existing dairy facility and agricultural operations currently developed on the project site would continue under the No Project Alternative. The existing herd size of 8,050 animals at the existing dairy facility would be maintained on the project sites in addition to continued use of the existing wastewater management system. Uses permitted under the General Agriculture zoning designation without discretionary approval by Merced County are limited to crop production, including orchards and vineyards. Thus, the agricultural activities permitted by Merced County zoning designations and the facilities currently developed on the project site would continue under the No Project Alternative.

There are 16 significant impacts that would occur with implementation of the proposed Hillcrest Dairy Expansion project. Of these, four impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality, one for greenhouse gas emissions, and one for water quality. The No Project Alternative would reduce the magnitude of anticipated environmental impacts associated with the proposed project. The No Project Alternative would avoid the increment of increase for air quality and greenhouse gas emission impacts as a result of the proposed project. The No Project Alternative would not create any construction impacts or provide a source of additional odors. The No Project Alternative would reduce the magnitude of impacts related to air quality; biological and cultural resources; greenhouse gas emissions and energy; nuisance insects; hydrology and soil erosion; and land use compatibility. Based on the foregoing, the No Project Alternative would result in fewer environmental effects than the proposed Hillcrest Dairy Expansion project. Table 13-1 includes an evaluation of the relative impacts of implementing Alternative 1 - No Project Alternative compared to the proposed project.

Table 13-1 Evaluation of Alternative 1 – No Project Alternative		
Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Air Quality and Odors		
Construction-related emissions	PS/LS	Reduced magnitude and significance from project since no additional dairy facilities would be constructed on the project site
Carbon monoxide emissions from operational equipment and increased traffic	LS	Reduced magnitude but not significance from project since there would be no increase in traffic
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Reduced magnitude and significance from project since there would be no increment of increase
PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS	Reduced magnitude but not significance from project since there would be no increment of increase

Table 13-1 Evaluation of Alternative 1 – No Project Alternative		
Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Adverse odor from project operations	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
Biological Resources		
Nest disturbance for Swainson's hawk	PS/LS	Reduced magnitude and significance from project since there would be no construction
Disruption to nesting activities of sensitive and migratory bird species	PS/LS	Reduced magnitude and significance from project since there would be no construction
Disruption to nesting activities for tricolored blackbird	PS/LS	Reduced magnitude and significance from project since there would be no construction
Cultural Resources and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of an archaeological resource	PS/LS	Reduced magnitude but not significance from project since ongoing cropping activities could result in discovery of unknown cultural resources
Result in the accidental discovery and disturbance of human remains	PS/LS	Reduced magnitude but not significance from project since ongoing cropping activities could result in accidental discovery of human remains
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
Greenhouse Gas Emissions and Energy Use		
Greenhouse gas emissions from project construction and operation	SU	Reduced magnitude and significance from project since there would be no increment of increase
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	No change from project
Nuisance Conditions from Insects		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project since there would be no increment of increase

Table 13-1 Evaluation of Alternative 1 – No Project Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Hydrology and Water Quality		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Reduced magnitude and significance from project since no additional dairy facilities would be constructed on the project site
Degradation of surface water quality from dairy expansion operations	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Groundwater contamination from dairy expansion operations	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Decrease groundwater supplies	LS	Reduced magnitude but not significance from project since there would be no increment of increase in groundwater use
Modification of surface water drainage patterns and an increase in runoff	LS	Reduced magnitude but not significance from project since no additional dairy facilities would be constructed on the project site
Water supply pathways for pollutant migration	LS	No change from project since existing wells are not a conduit for contamination
Impacts to water quality at off-site locations as a result of project operations	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase in exported manure
Potential selenium and heavy metals effects to on-site biological resources	LS	Reduced magnitude but not significance from project since there would be no increment of increase in the amount of feed
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
Land Use Compatibility		
Consistency with Merced County Land Use Plans and policies	LS	No impact since no additional dairy facilities would be constructed on the project site
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Cumulative Impacts		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	Reduced magnitude and significance from project since there would be no cumulatively considerable contribution
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	SU	Reduced magnitude and significance from project since there would be no cumulatively considerable contribution
Hazards (Nuisance Insects)	LS	No change from project
Hydrology and Water Quality	SU	Reduced magnitude and significance from project since there would be no cumulatively considerable contribution
Land Use	LS	No change from project

Table 13-1 Evaluation of Alternative 1 – No Project Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Public Services	LS	No change from project
Recreation	LS	No change from project
Transportation and Circulation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	Reduced magnitude but not significance from project
Potential Environmental Damage from Accidents	LS	No change from project

LS = Less than significant impact; PS/LS = Less than significant impact with mitigation; SU = Significant and unavoidable impact

Implementation of the No Project Alternative may not fully meet the following goals of the project applicant in proposing the Hillcrest Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* Under this alternative, no dairy expansion would be developed. Smaller dairy farms in the U.S. are observed to have higher costs per unit of milk produced than larger farms, largely due to farm inefficiencies and economies of size (Tauer and Mishra 2005). Larger farms realize lower production costs for a number of reasons, including fixed capital costs spread over more units of output, access to better technologies, specialization at larger farms, and volume discounts for input items such as feed. The cost advantages of a larger size allow large dairy farms to be more profitable than smaller operations (USDA 2007).
- *To generate dry manure and manure slurry that can be land applied and/or sold as a commodity for use as fertilizer in the region.* Since the dairy expansion would not occur, reduced amounts of dairy process water and manure would be generated and exported off site. Exported solid manure applied to off-site agricultural fields not owned by the project applicant would increase from 19,998 tons to 33,198 tons with the proposed expansion. (DEIR, Chapter 3, *Project Description*, page 3-15)
- *To provide year-round employment opportunities, at competitive wages, for Merced County residents. Unlike other agricultural operations, which provide only seasonal employment, dairies provide year-round employment.* The dairy under existing operations currently employs a staff of approximately 50 workers; with implementation of the proposed expansion, the number of employees would remain at 50 workers. The proposed expansion would increase production capacity with the same number workers, but would result in a more stable and profitable business. Since the dairy expansion would not occur under this alternative, the business would be more susceptible to market fluctuations and could result in a less-stable work environment. (DEIR, Chapter 3, *Project Description*, page 3-15)

ALTERNATIVE 2 – ON-SITE ANAEROBIC DIGESTER ALTERNATIVE

Under the On-Site Anaerobic Digester Alternative, an anaerobic digester would be constructed at the existing dairy, or an existing wastewater pond would be covered and constructed as an anaerobic digester. An on-site combustion engine would be used to convert the biogas to electricity. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the On-Site Anaerobic Digester Alternative. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Climate Change Scoping Plan (ARB 2014) recommended actions for the agriculture sector.

In addition to generating renewable energy, anaerobic digestion leads to reduced odor pollution, fewer pathogens, and reduced greenhouse gas emissions. There is little change in the nutrient value of the manure and organic matter that passes through the process, which can then be used as fertilizer (eXtension 2019). Methane produced from the collected manure (termed “biogas”) can be captured with an estimated effectiveness of 95 percent. It is estimated that combustion of biomethane for energy recovery will convert up to 99 percent of the methane into carbon dioxide. Taking the effect of the CO₂ produced from the combustion of CH₄ into account, an overall reduction of 63.5 percent of fugitive CH₄ emissions can be achieved by the use of properly designed and controlled anaerobic treatment (SJVAPCD 2009). Of the 50 operating anaerobic digesters at California dairies (with data) as reported by the U.S. EPA AgSTAR program in 2021, the average methane emission reduction on a dairy farm was approximately 40,215 metric tons of CO₂ equivalents per year (with a median value of 34,415 metric tons of CO₂ equivalents per year), or an approximate 8.1 metric tons of CO₂ equivalents per year reduction per cow (EPA 2021).

Under this alternative, the methane from a digester is destroyed through combustion in an engine, flare, or other devices. Burning biogas reduces greenhouse gas emissions in two ways. First, when manure is stored in a conventional liquid handling system without a digester, it typically emits a certain amount of methane-containing biogas. When that methane is collected in a digester and burned, it then will not escape into the atmosphere and cause warming. Second, electricity generated from that digester biogas will typically replace fossil fuel-generated electricity, and there would be a reduction in CO₂ emissions from not burning that fossil fuel (eXtension 2019).

Despite the benefits of anaerobic digestion systems in relation to greenhouse gases and odors, these systems could result in increased nitrogen oxide emissions, and soil and groundwater contamination.² The anaerobic treatment process creates intermediates such as ammonia, hydrogen sulfide, orthophosphates, and various salts, all of which must be properly controlled or captured. In addition, atmospheric releases at locations off-site where biogas is shipped may negate or decrease the benefit of emissions controls on-site. Thus, while devices such as Selective Catalyst Reduction units can reduce NO_x emissions and proper treatment system operation can control intermediates, improper design or operation may lead to violations of federal, state, and local air quality regulations as well as the release of toxic air contaminants. With regard to water quality, it is critical that project developers and managers ensure digester integrity, and fully consider and address post-digestion management of the effluent in order to avoid contamination of local waterways and groundwater

² The combustion of biogas could result in increased nitrogen oxide emissions. While devices such as Selective Catalyst Reduction units can reduce NO_x emissions, uncontrolled emissions from combustion of biogas may contain between 200 to 300 ppm of NO_x (de Boer 2008).

resources (de Boer 2008). Catastrophic digester failures, leakage from pipework and tanks, and lack of containment in waste storage areas are all examples of potential problems. Further, application of improperly treated digestate and/or improper application timing or rates of digestate to agricultural land may lead to increased nitrogen oxide emissions, soil contamination, and/or nutrient leaching, thus negating or reducing benefits of the project overall (CCAR 2013).

To facilitate the permitting of dairy digesters in the Central Valley, the Central Valley Regional Water Control Board (CVRWQCB) adopted the Waste Discharge Regulatory Program for Dairy Manure Digester and Co-Digester Facilities, and evaluated the potential environmental impacts of the program in the Dairy Manure Digester and Co-Digester Facilities Draft Program EIR (Dairy Digester Program EIR) (CVRWCB 2010). In order to evaluate potential construction and operational emissions for the On-Site Anaerobic Digester Alternative, this EIR references the air quality analysis included in the Dairy Digester Program EIR. There are numerous uncertainties regarding details of the anaerobic digester that would be appropriate and preferable for the Hillcrest Dairy operation, including but not limited to location, size, engine type, and use of a co-digester³, making project-specific quantification of air emissions and air toxics speculative and beyond the scope of this alternative. The emission estimates for a single digester included in the Dairy Digester Program EIR provide adequate information for a meaningful evaluation and comparison with the proposed project, and will be used in this analysis.

As evaluated in Chapter 5, *Air Quality and Greenhouse Gas Emissions*, of the Dairy Digester Program EIR, construction and operation of a dairy digester is not anticipated to exceed San Joaquin Valley Air Pollution Control District (SJVAPCD) thresholds of significance in most cases (CVRWCB 2010). Operational emissions of an individual digester would result in no net increase of ROG/VOC emissions⁴, and a net increase in NO_x, PM₁₀, PM_{2.5}, SO₂, and CO from vehicle and equipment emissions and biogas combustion emissions. While the digester itself would not result in an increase in criteria air pollutants that would exceed SJVAPCD criteria, the On-Site Anaerobic Digester Alternative would result in an increase in air pollutant emissions compared to the proposed project that could exceed SJVAPCD criteria.

Prior to implementation of this alternative, as required by the RWQCB Dairy Digester Program EIR, an air quality technical report would be prepared to determine if construction and operation related air pollutant emissions would exceed SJVAPCD thresholds, as well as whether any health risks associated with toxic air contaminants would result. The technical report would evaluate all project emissions according to CEQA, and would include mitigation measures designed to reduce emissions below levels of significance, if necessary. Additional permits would also be required for the digester depending on location and resources affected. An Authority to Construct and Permit to Operate would be required from the SJVAPCD.

Another important consideration in this alternative is the feasibility of installing manure digesters at dairies in the San Joaquin Valley. Several studies have examined the financial feasibility of installing different types of manure digester operations and determined that financial feasibility is highly dependent on state and federal government assistance. In one particular study, most of the project scenarios reviewed had high energy production costs or limited revenues and, as a result, were not

³ A dairy digester pipeline cluster alternative is considered below.

⁴ While there would be an increase in VOC emissions as a result of vehicle and equipment emissions and biogas combustion, the digester would reduce VOC emissions from the lagoon.

economically viable without ongoing assistance (USDA 2013). A different study examining the economic feasibility of six operating dairy methane digester systems in California confirmed that there are great cost challenges to overcome for many California dairy digester projects to become feasible without subsidies under the currently available rate structures (CEC 2013). In that study, only one operation out of the six could be considered feasible when excluding grant money. Additionally, a 2011 CVRWQCB study evaluating the economic feasibility of dairy manure digester and co-digester facilities in the Central Valley concluded that for dairy digester projects to become financially viable, they must cost less to build and run, and they must generate larger revenue streams (CVRWQCB 2011). The most recent 2022 CARB *Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target* concluded that financial incentives continue to be needed for California's dairy sector to adopt methane reduction strategies that include installation of anaerobic digesters and alternative manure management practices (CARB 2022).

The installation of manure digesters to reduce methane emissions was included as a voluntary strategy for the agricultural sector in the ARB Scoping Plan, and will continue to be voluntary at least through 2023. Funds from the Cap-and-Trade Program are allocated to the Greenhouse Gas Reduction Fund to be administered by California Department of Food and Agriculture's (CDFA) to support such projects. CDFA has awarded a total of \$195.5 million for 118 dairy digester projects from 2015 through 2020 through the Dairy Digester Research and Development Program (DDRDP), and over \$67 million for 114 manure management projects for that time period through the Alternative Manure Management Program (AMMP) (CDFA 2022). Alternative projects could include installation of mechanical manure solids separation on dairies with flush systems, or conversion to dry manure management practices, such as scrape or vacuum systems, combined with composting or solar drying of manure. Current DDRDP projects are expected to reduce greenhouse gas emissions by an estimated 21.12 million metric tons of CO₂e over ten years. The 114 AMMP projects awarded so far are expected to reduce greenhouse gas emissions by an estimated 2.21 million metric tons of CO₂e over 10 years (CDFA 2022).

Despite the availability of both federal and state funding for digester construction, policies and initiatives to support the installation of digesters, and the existence of the ARB offset protocol for livestock projects, only a small fraction of California's roughly 1,500 dairy farms currently have working digesters (CalCAN 2015; EPA 2021).

There are 16 significant impacts that would occur with implementation of the proposed Hillcrest Dairy Expansion project. Of these, four impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality, one for greenhouse gas emissions, and one for water quality. The On-Site Anaerobic Digester Alternative would reduce the magnitude of anticipated environmental impacts associated with the proposed project. The On-Site Anaerobic Digester Alternative would reduce, but not avoid, odor impacts. Greenhouse gas emissions would also be reduced. There would be an increase in most criteria air pollutant emissions as described above, including an increase in toxic air emissions that could impact sensitive receptors. While the anaerobic digester would reduce pathogens in the liquid manure stored in the lagoon and applied to cropland off site, because the dry manure exported off site is separated from the waste stream and would not be processed in the manure digester, it would not minimize potential impacts from manure pathogen transport off site. The On-Site Anaerobic Digester Alternative would also reduce the magnitude of impacts related to energy use and water quality. Because the digester equipment could require additional area beyond the existing dairy footprint, this alternative could require conversion of cropland for the digester and potentially increased impacts to biological and

cultural resources. Based on the foregoing, the On-Site Anaerobic Digester Alternative would result in fewer environmental effects than the proposed Hillcrest Dairy Expansion project. Table 13-2 includes an evaluation of the relative impacts of implementing Alternative 2 - On-Site Anaerobic Digester Alternative compared to the proposed project.

Table 13-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative		
Impact	Level of Impact for Project	Level of Impact of Alternative 2 Compared to Proposed Project
Air Quality and Odors		
Construction-related emissions	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional emissions
Carbon monoxide emissions from operational equipment and increased traffic	LS	Increased magnitude but not significance from project since there would be additional equipment and vehicle trips associated with the digester
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Increased magnitude but not significance from project, since the manure digester could result in increased ozone precursor emissions
PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS	Increased magnitude but not significance from project, since there would be additional vehicle trips associated with the digester
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS	Potentially increased magnitude but not significance from project, since there would be additional air toxic emissions generated by the combustion of biogas
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS	Potentially increased magnitude but not significance from project, since there would be additional air pollutant emissions from the digester operations
Adverse odor from project operations	PS/LS	Reduced magnitude but not significance from project
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
Biological Resources		
Nest disturbance for Swainson's hawk	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional construction and conversion of cropland for the digester
Disruption to nesting activities of sensitive and migratory bird species	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional construction and conversion of cropland for the digester
Disruption to nesting activities for tricolored blackbird	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional construction and conversion of cropland for the digester
Cultural Resources and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of an archaeological resource	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional ground disturbance
Result in the accidental discovery and disturbance of human remains	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional ground disturbance

Table 13-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 2 Compared to Proposed Project
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
Greenhouse Gas Emissions and Energy Use		
Greenhouse gas emissions from project construction and operation	SU	Reduced magnitude and significance from project
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project
Increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions	LS	Reduced magnitude but not significance from project
Nuisance Conditions from Insects		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude but not significance from project
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project since the wastewater lagoon would be covered
Hydrology and Water Quality		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Increased magnitude but not significance from project
Degradation of surface water quality from dairy expansion operations	LS	No change from project
Groundwater contamination from dairy expansion operations	PS/LS	Potential increased magnitude but not significance from project since nitrogen from the manure digester may be more readily available to the crops and could result in over application of nitrogen
Decrease groundwater supplies	LS	No change from project
Modification of surface water drainage patterns and an increase in runoff	LS	No change from project
Water supply pathways for pollutant migration	LS	No change from project since existing wells are not a conduit for contamination
Impacts to water quality at off-site locations as a result of project operations	PS/LS	No change from project
Potential selenium and heavy metals effects to on-site biological resources	LS	No change from project since there would be no change in the amount of feed required
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
Land Use Compatibility		
Consistency with Merced County Land Use Plans and policies	LS	No change from project
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude but not significance from project
Cumulative Impacts		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project

Table 13-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 2 Compared to Proposed Project
Air Quality	SU	Increased magnitude but not significance from project
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	SU	Reduced magnitude and significance from project
Hazards (Nuisance Insects)	LS	No change from project
Hydrology and Water Quality	SU	Potential increased magnitude but not significance
Land Use and Planning	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Public Services	LS	No change from project
Recreation	LS	No change from project
Transportation and Circulation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	No change from project
Potential Environmental Damage from Accidents	LS	No change from project

LS = Less than significant impact; PS/LS = Less than significant impact with mitigation; SU = Significant and unavoidable impact

Implementation of the Anaerobic Digester Alternative may not fully meet the following goals of the project applicant in proposing the Hillcrest Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* This alternative would be less effective in reducing impacts of the project compared to the other action alternatives (see DEIR Table 13-7 for a relative comparison of alternatives). The dairy digester represents a large capital cost and requires proper management and maintenance to realize a financial return. Further, installation of manure digesters to reduce methane emissions is a voluntary strategy in the ARB Scoping Plan.
- *To construct improvements that can be permitted within a reasonable time frame and would represent commensurate benefit with cost.* This alternative may take additional time to permit with both the SJVAPCD and the CVRWQCB. In addition, studies have found installing dairy digesters are generally not financially feasible without the infusion of grant funds, which are competitive and uncertain.

ALTERNATIVE 3 – DAIRY DIGESTER CLUSTER ALTERNATIVE

The dairy digester cluster concept involves gathering raw dairy biogas from a cluster of existing dairy operations and transferring it to a centralized hub where gas cleaning and conditioning occurs. Under the Dairy Digester Cluster Alternative, an anaerobic digester would be constructed at the existing Hillcrest Dairy, or the existing wastewater lagoons would be covered and re-constructed as

an anaerobic digester. Underground pipeline would be installed to transport the biogas from the dairy to a biogas upgrading facility. The compressed natural gas could be injected into a utility pipeline, or used as a transportation fuel, replacing diesel. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the Dairy Digester Pipeline Cluster Alternative. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Climate Change Scoping Plan recommended actions for the agriculture sector.

In addition to generating renewable energy, anaerobic digestion leads to reduced odor pollution, a decrease in manure pathogens, and reduced greenhouse gas emissions. However, this alternative could result in increased impacts to biological resources and/or unknown cultural resources during construction of the proposed pipeline. This alternative would not result in increased operational criteria air pollutant emissions, since there would be no combustion of biogas for energy recovery. Rather, the biogas would be transported to a biogas upgrading facility, where it would be injected into a regional utility pipeline. In the case of the Hillcrest Dairy, there is currently no existing dairy digester cluster network in the nearby area to join. However, there is a biogas pipeline and digester cluster network located over 10 miles to the south and west of the Hillcrest Dairy.

The Central Valley Regional Water Quality Control Board (CVRWQCB) regulates dairy digester facilities in its region under Waste Discharge Requirements (WDR). Existing dairies currently covered under the WDR General Order for Existing Milk Cow Dairies (Dairy General Order) that construct and operate a manure-only digester using only manure generated onsite could retain regulatory coverage under the Dairy General Order. Prior to implementation of this alternative, review and/or approval from the SJVAPCD and CVRWQCB would be required.

Another important consideration in this alternative is the financial feasibility of installing manure digesters at dairies in the San Joaquin Valley (this general topic is explored more fully under Alternative 2 – On-Site Anaerobic Digester Alternative, above). A study looking at the overall viability of dairy digester clusters, including a specific case study in Kern County, concluded that financial feasibility is highly dependent on state and federal government assistance. However, connection to a dairy digester pipeline cluster project may be considered more attractive to a dairy operator, since the cluster is usually formed by an outside entity that assists in permit and grant applications, and generally takes on maintenance responsibilities. In late 2018, California launched its first dairy digester pipeline cluster in Tulare County, organized by Calgren Renewable Fuels in partnership with Maas Energy Works and approximately one dozen dairy operators. The cluster includes 22 miles of pipeline and 75,000 cows that contribute to the interconnected system. The system is estimated to reduce approximately 1,867,651 metric tons of CO₂ equivalents over 10 years. The digesters and the cluster project were made possible in part by grants in 2017 and 2018 from CDFA Dairy Digester Research and Development Program totaling approximately \$16 million, with an additional \$17.5 million in matching funds provided by the dairies and Calgren Renewable Fuels.

The installation of manure digesters to reduce methane emissions was included as a voluntary strategy for the agricultural sector in the ARB Scoping Plan, and will continue to be voluntary at least through 2023. All DDRDP projects funded by CDFA in 2020 were for projects that generate renewable natural gas.

There are 16 significant impacts that would occur with implementation of the proposed Hillcrest Dairy Expansion project. Of these, four impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality, one for greenhouse gas

emissions, and one for water quality. The Dairy Digester Cluster Alternative would reduce the magnitude of anticipated environmental impacts associated with the proposed project. The Dairy Digester Cluster Alternative would reduce, but not avoid, odor impacts. Greenhouse gas emissions would also be reduced, though there would be an increase in greenhouse gas emissions during pipeline construction. While the anaerobic digester would reduce pathogens in the liquid manure stored in the lagoon and applied to cropland off site, because the dry manure exported off site is separated from the waste stream and would not be processed in the manure digester, it would not minimize potential impacts from manure pathogen transport off site. The Dairy Digester Cluster Alternative would also reduce the magnitude of impacts related to energy use and water quality. Because the digester equipment could require additional area beyond the existing dairy footprint, this alternative could require conversion of cropland for the digester and pipeline and potentially increased impacts to biological and cultural resources. Based on the foregoing, the Dairy Digester Cluster Alternative would result in fewer environmental effects than the proposed Hillcrest Dairy Expansion project. Table 13-3 includes an evaluation of the relative impacts of implementing Alternative 3 - Dairy Digester Cluster Alternative compared to the proposed project.

Table 13-3 Evaluation of Alternative 3 – Dairy Digester Cluster Alternative		
Impact	Level of Impact for Project	Level of Impact of Alternative 3 Compared to Proposed Project
Air Quality and Odors		
Construction-related emissions	PS/LS	Increased magnitude but not significance from project since construction of the digester and pipeline would result in additional emissions
Carbon monoxide emissions from operational equipment and increased traffic	LS	Increased magnitude but not significance from project since there would be additional equipment and vehicle trips associated with the digester
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Increased magnitude but not significance from project, since there would be additional equipment and vehicle trips associated with the digester
PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS	Increased magnitude but not significance from project, since there would be additional vehicle trips associated with the digester
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS	No change from project
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS	No change from project
Adverse odor from project operations	PS/LS	Reduced magnitude but not significance from project
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
Biological Resources		
Nest disturbance for Swainson's hawk	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester and pipeline

Table 13-3 Evaluation of Alternative 3 – Dairy Digester Cluster Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 3 Compared to Proposed Project
Disruption to nesting activities of sensitive and migratory bird species	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester and pipeline
Disruption to nesting activities for tricolored blackbird	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester and pipeline
Cultural Resources and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of an archaeological resource	PS/LS	Increased magnitude but not significance from project since construction of the digester and pipeline would result in additional ground disturbance
Result in the accidental discovery and disturbance of human remains	PS/LS	Increased magnitude but not significance from project since construction of the digester and pipeline would result in additional ground disturbance
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
Greenhouse Gas Emissions and Energy Use		
Greenhouse gas emissions from project construction and operation	SU	Reduced magnitude and significance from project
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project
Increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions	LS	Reduced magnitude but not significance from project
Nuisance Conditions from Insects		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude but not significance from project
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project since the wastewater lagoon would be covered
Hydrology and Water Quality		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Increased magnitude but not significance from project
Degradation of surface water quality from dairy expansion operations	LS	No change from project
Groundwater contamination from dairy expansion operations	PS/LS	Potential increased magnitude but not significance from project since nitrogen from the manure digester may be more readily available to the crops and could result in over application of nitrogen
Decrease groundwater supplies	LS	No change from project
Modification of surface water drainage patterns and an increase in runoff	LS	No change from project
Water supply pathways for pollutant migration	LS	No change from project since existing wells are not a conduit for contamination
Impacts to water quality at off-site locations as a result of project operations	PS/LS	No change from project

Table 13-3 Evaluation of Alternative 3 – Dairy Digester Cluster Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 3 Compared to Proposed Project
Potential selenium and heavy metals effects to on-site biological resources	LS	No change from project since there would be no change in the amount of feed required
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
Land Use Compatibility		
Consistency with Merced County Land Use Plans and policies	LS	No change from project
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude but not significance from project
Cumulative Impacts		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	Increased magnitude but not significance from project
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	SU	Reduced magnitude and significance from project
Hazards (Nuisance Insects)	LS	No change from project
Hydrology and Water Quality	SU	Increased magnitude but not significance from project
Land Use and Planning	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Public Services	LS	No change from project
Recreation	LS	No change from project
Transportation and Circulation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	No change from project
Potential Environmental Damage from Accidents	LS	No change from project

LS = Less than significant impact; PS/LS = Less than significant impact with mitigation; SU = Significant and unavoidable impact

Implementation of the Dairy Digester Cluster Alternative may not fully meet the following goals of the project applicant in proposing the Hillcrest Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* This alternative would be less effective in reducing impacts of the project compared to the limited herd size action alternative (see DEIR Table 13-7 for a relative comparison of alternatives). The dairy digester as part of a dairy digester cluster represents a large capital cost and requires proper management and maintenance to realize a financial return. In addition, construction of the connecting pipeline

includes additional construction costs, acquisition of right-of-way or coordination of easements, coordination with utilities, much of which is outside the control of the dairy operator. Further, installation of manure digesters to reduce methane emissions is a voluntary strategy in the ARB Scoping Plan.

- *To construct improvements that can be permitted within a reasonable time frame and would represent commensurate benefit with cost.* This alternative may take additional time to permit with both the SJVAPCD and the CVRWQCB, and overall to coordinate with and join the nearby dairy digester cluster. In addition, studies have found installing dairy digesters are generally not financially feasible without the infusion of grant funds, which are uncertain.

ALTERNATIVE 4 – AIR EMISSIONS LIMITED HERD SIZE

In general, the amount of air emissions and volume of manure and process water generated at animal confinement facilities are proportional to the number of animals managed at the facilities. A limitation in the number of dairy cows and support stock at the Hillcrest Dairy Expansion project would result in a corresponding limitation in manure and associated air emissions, and an overall limitation in the equipment and increased traffic. This restriction would reduce volatile organic compounds (VOC) emissions, an ozone precursor, for the proposed project to less-than-significant levels.

Assumptions regarding the operational characteristics of the dairy project under the Limited Herd Size alternative would remain the same as for the proposed project. Flushing of the barns and scraping of corrals would generate manure and process water. The process water generated by the dairy would be reused as irrigation for the growing of silage and other crops adjacent to animal confinement facilities, and applied to nearby agricultural fields off site. Dry manure generated by the dairy would be separated from liquids, accumulated on site, and processed for bedding material, or sold and hauled off site for use as fertilizer and soil amendments. The amount of process water and manure generated at the dairy under this alternative would be expected to be proportional to the herd size.

The alternative would restrict the milking herd to 4,400, with a total herd size of 8,580 animals instead of the proposed 5,000 milk cows and a total herd size of 9,750 cows. This alternative would reduce the size of the Hillcrest Dairy Expansion herd to approximately 88 percent of the proposed total herd. Table 13-4 shows the existing and proposed herd size for the Hillcrest Dairy Expansion Alternative 4 - Air Emissions Limited Herd Size.

Table 13-4 Existing and Proposed Herd for Alternative 4 – Air Emissions Limited Herd Size							
	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo.)	Calves (4-6 mo.)	Calves (0-3 mo.)	Total Animals
Existing	4,000	750	1,400	500	1,400	0	8,050
Proposed	4,400	660	1,430	1,430	660	0	8,580
<i>Change</i>	<i>400</i>	<i>-90</i>	<i>30</i>	<i>930</i>	<i>-740</i>	<i>0</i>	<i>530</i>

Source: Planning Partners 2022.

The VOC Emission Factors used in this analysis are from the dairy emissions calculator spreadsheet provided by the SJVAPCD (dated January 2020). Aggregated VOC emissions for all activities

associated with the Hillcrest Dairy Expansion Alternative 4 Air Emissions Limited Herd Size are presented in Table 13-5 below.

Table 13-5 Aggregated VOC Emissions for Alternative 4 – Air Emissions Limited Herd Size			
Emission Source	Existing VOC/ROG Emissions	Proposed VOC/ROG Emissions	Increment of Increase with Alternative 4 Herd
Traffic, Onsite Mobile Source, and Area Sources			0.78
Farm Equipment	1.64	1.64	0.00
Manure Management and Feed	67.29	75.88	8.59
Total			9.37
SJVAPCD Significance Criterion			10 tons/year
Criterion Exceeded?			NO

Source: Planning Partners 2022.

There are 16 significant impacts that would occur with implementation of the proposed Hillcrest Dairy Expansion project. Of these, four impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality, one for greenhouse gas emissions, and one for water quality. Limiting the size of the Hillcrest Dairy Expansion would reduce individual project effects for ozone precursor emissions to a less-than-significant level. The magnitude of water quality effects would also be reduced, in addition to water quality contamination from manure transport off site, and nuisance effects from insects, although the level of significance would remain unchanged. Potential effects related to construction, including PM₁₀ construction effects, would be reduced under the limited herd alternative since construction of the dairy facilities would result in a smaller facility than the proposed project. Implementation of the Air Emissions Limited Herd Size Alternative would reduce the magnitude of impacts related to air quality; biological and cultural resources; and greenhouse gas emissions and energy. Following is a comparative evaluation of implementing the Air Emissions Limited Herd Size Alternative (see Table 13-6) compared to the effects of the proposed project.

Table 13-6 Evaluation of Alternative 4 – Air Emissions Limited Herd Size Alternative		
Impact	Level of Impact for Project	Level of Impact of Alternative 4 Compared to Proposed Project
Air Quality and Odors		
Construction-related emissions	PS/LS	Reduced magnitude but not significance from project
Carbon monoxide emissions from operational equipment and increased traffic	LS	Reduced magnitude but not significance from project
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Reduced magnitude and significance from project
PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS	No change from project, since dust generated by the project would be reduced with the change in cow housing

Table 13-6 Evaluation of Alternative 4 – Air Emissions Limited Herd Size Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 4 Compared to Proposed Project
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS	Reduced magnitude but not significance from project
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS	Reduced magnitude but not significance from project
Adverse odor from project operations	PS/LS	Reduced magnitude but not significance from project
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
Biological Resources		
Nest disturbance for Swainson's hawk	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Disruption to nesting activities of sensitive and migratory bird species	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Disruption to nesting activities for tricolored blackbird	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Cultural Resources and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of an archaeological resource	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Result in the accidental discovery and disturbance of human remains	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
Greenhouse Gas Emissions and Energy Use		
Greenhouse gas emissions from project construction and operation	SU	Reduced magnitude but not significance from project since the mature herd would still exceed 3,200 cows
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project
Increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions	LS	Reduced magnitude but not significance from project
Nuisance Conditions from Insects		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude but not significance from project
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project
Hydrology and Water Quality		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Reduced magnitude but not significance from project
Degradation of surface water quality from dairy expansion operations	LS	Reduced magnitude but not significance from project
Groundwater contamination from dairy expansion operations	PS/LS	Reduced magnitude but not significance from project

Table 13-6 Evaluation of Alternative 4 – Air Emissions Limited Herd Size Alternative

Impact	Level of Impact for Project	Level of Impact of Alternative 4 Compared to Proposed Project
Decrease groundwater supplies	LS	Reduced magnitude but not significance from project
Modification of surface water drainage patterns and an increase in runoff	LS	Reduced magnitude but not significance from project
Water supply pathways for pollutant migration	LS	No change from project
Impacts to water quality at off-site locations as a result of project operations	PS/LS	Reduced magnitude but not significance from project
Potential selenium and heavy metals effects to on-site biological resources	LS	Reduced magnitude but not significance from project since there would be a reduced increment of increase in the amount of feed
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
Land Use Compatibility		
Consistency with Merced County Land Use Plans and policies	LS	No change from project
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude but not significance from project
Cumulative Impacts		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	Reduced magnitude and significance from project
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	SU	Reduced magnitude but not significance from project
Hazards (Nuisance Insects)	LS	No change from project
Hydrology and Water Quality	SU	Reduced magnitude but not significance from project
Land Use and Planning	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Public Services	LS	No change from project
Recreation	LS	No change from project
Transportation and Circulation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	No change from project
Potential Environmental Damage from Accidents	LS	No change from project

LS = Less than significant impact; PS/LS = Less than significant impact with mitigation; SU = Significant and unavoidable impact

Implementation of the Air Emissions Limited Herd Size Alternative may not meet the following goals of the project applicant in proposing the Hillcrest Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* As discussed under the No Project Alternative, the cost advantages of a larger size allow large dairy farms to be more profitable than smaller operations. While the dairy facilities would be expanded under this alternative, a reduced herd size would make it difficult for this dairy to realize its full economic potential and to maintain competitive operations.

13.2 COMPARISON OF THE ENVIRONMENTAL MERITS OF EACH ALTERNATIVE

In Table 13-7, the symbol “-5” means that an alternative has a lower magnitude of impact and level of significance than that for the project (e.g., the adverse environmental condition is less than for the project, so that the impact is less than significant rather than significant). The symbol “-1” means that an alternative has a lower magnitude of impact than that for the project (e.g., the adverse environmental condition is somewhat less than for the project, but the significance of the impact is unchanged). The symbol “0” means that the alternative has an environmental effect that is equal in significance and magnitude to the proposed project. The symbol “+1” means that an alternative has a higher magnitude of impact than that for the project (e.g., adverse environmental condition is more than for the project, but the significance of the impact is unchanged). Finally, the symbol “+5” means that an alternative has a more significant impact than the proposed project (i.e., a significant impact rather than less than significant). These numerical values have been assigned to these categories in order to assess each alternative across a large number of impact areas.

Definition	Numerical Value (as explained below and shown in Table 13-7)
Reduced magnitude and significance of impact compared to proposed project	-5
Reduced magnitude of impact, but no change in level of significance	-1
Same magnitude and significance of impact as proposed project	0
Increased magnitude of impact, but no change in level of significance	1
Increased magnitude and significance of impact compared to proposed project	5

Because the emphasis of the alternatives analysis is on minimizing or avoiding impacts, those categories associated with avoiding or causing impacts not attributable to the project are assigned a value of -5 or 5 respectively. If an alternative lessens or increases the magnitude of an impact without changing its significance, the category is assigned a value of -1 or 1. The number at the bottom of Table 13-7 indicates, for each alternative, the net number of identified impacts of the project that were avoided or reduced by the alternative.

CEQA requires the selection of an environmentally superior alternative; however, if the environmentally superior alternative is the “no project” alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)). Therefore, based on this comparative evaluation, Alternative 4 (Air Emissions Limited Herd Size Alternative) would reduce the magnitude of the most impacts as an action alternative. Several of the significant impacts identified for the project would be reduced, but not eliminated, with implementation of Alternative 4. Alternative 4 would be the environmentally superior alternative.

The Merced County Planning Commission will consider the selection of a preferred project upon review of this EIR and other information in the public record. Identification of an environmentally superior alternative does not require that Merced County choose that alternative. In choosing a preferred project, Merced County is required to make written findings regarding its choice of a project to implement, including the reasons why it chose not to implement an environmentally superior alternative or alternatives, if the selected project is not the environmentally superior alternative. In the findings, Merced County must set forth its reasoning for proceeding with the Hillcrest Dairy Expansion project. Such reasoning could include the social, economic, or other benefits provided by the Hillcrest Dairy Expansion project. This process allows a lead agency to balance any environmental harm with other factors appropriate in judging the merits of a project.

Table 13-7 Relative Comparison of Alternatives					
Impact	Level of Impact for Project	Alt. 1 – No Project	Alt. 2 – Anaerobic Digester	Alt. 3 – Dairy Digester Cluster	Alt. 4 – Limited Herd Size
Air Quality and Odors					
Construction-related emissions	PS/LS	-5	+1	+1	-1
Carbon monoxide emissions from operational equipment and increased traffic	LS	-1	+1	+1	-1
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	-5	+1	+1	-5
PM ₁₀ and PM _{2.5} emissions from fugitive dust during project operations	LS	-1	+1	+1	0
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	LS	-1	+1	0	-1
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	LS	-1	+1	0	-1
Adverse odor from project operations	PS/LS	-5	-1	-1	-1
Conflict with or obstruct implementation of the applicable air quality plan	LS	0	0	0	0
Biological Resources					
Nest disturbance for Swainson's hawk	PS/LS	-5	+1	+1	-1
Disruption to nesting activities of sensitive and migratory bird species	PS/LS	-5	+1	+1	-1
Disruption to nesting activities for tricolored blackbird	PS/LS	-5	+1	+1	-1
Cultural Resources and Tribal Cultural Resources					
Cause a substantial adverse change in the significance of an archaeological resource	PS/LS	-1	+1	+1	-1
Result in the accidental discovery and disturbance of human remains	PS/LS	-1	+1	+1	-1
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	0	0	0	0

Table 13-7 Relative Comparison of Alternatives

Impact	Level of Impact for Project	Alt. 1 – No Project	Alt. 2 – Anaerobic Digester	Alt. 3 – Dairy Digester Cluster	Alt. 4 – Limited Herd Size
Greenhouse Gas Emissions and Energy Use					
Greenhouse gas emissions from project construction and operation	SU	-5	-5	-5	-1
Wasteful or inefficient use of energy	LS	-1	-1	-1	-1
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	0	-1	-1	-1
Nuisance Conditions from Insects					
Increased fly production and related nuisance effects	PS/LS	-5	-1	-1	-1
Create significant nuisance conditions due to increased mosquito production	LS	-1	-1	-1	-1
Hydrology and Water Quality					
Degradation of water quality due to storm water runoff during project construction	PS/LS	-5	+1	+1	-1
Degradation of surface water quality from dairy expansion operations	LS	-1	0	0	-1
Groundwater contamination from dairy expansion operations	PS/LS	-5	+1	+1	-1
Decrease groundwater supplies	LS	-1	0	0	-1
Modification of surface water drainage patterns and an increase in runoff	LS	-1	0	0	-1
Water supply pathways for pollutant migration	LS	0	0	0	0
Impacts to water quality at off-site locations as a result of project operations	PS/LS	-5	0	0	-1
Potential selenium and heavy metals effects to on-site biological resources	LS	-1	0	0	-1
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	0	0	0	0
Land Use Compatibility					
Consistency with Merced County Land Use Plans and policies	LS	0	0	0	0
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	-5	-1	-1	-1
Cumulative Impacts					
Aesthetics	LS	0	0	0	0
Agricultural Resources	LS	0	0	0	0
Air Quality	SU	-5	+1	+1	-5
Biological Resources	LS	0	0	0	0
Cultural Resources	LS	0	0	0	0

Table 13-7 Relative Comparison of Alternatives

Impact	Level of Impact for Project	Alt. 1 – No Project	Alt. 2 – Anaerobic Digester	Alt. 3 – Dairy Digester Cluster	Alt. 4 – Limited Herd Size
Geological Resources	LS	0	0	0	0
GHG Emissions	SU	-5	-5	-5	-1
Hazards (Nuisance Insects)	LS	0	0	0	0
Hydrology and Water Quality	SU	-5	+1	+1	-1
Land Use and Planning	LS	0	0	0	0
Mineral Resources	LS	0	0	0	0
Noise	LS	0	0	0	0
Population and Housing	LS	0	0	0	0
Public Services	LS	0	0	0	0
Recreation	LS	0	0	0	0
Transportation and Circulation	LS	0	0	0	0
Utilities and Service Systems	LS	0	0	0	0
Growth Inducement & Secondary Effects	LS	0	0	0	0
Irreversible Commitment of Resources	LS	-1	0	0	0
Potential Environmental Damage from Accidents	LS	0	0	0	0
Impacts Relative to Project		-88	-1	-3	-35

LS = Less than significant impact; PS/LS = Less than significant impact with mitigation; SU = Significant and unavoidable impact

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