California Environmental Quality Act (CEQA)

Administrative Draft Initial Study

Supporting the Preparation of a Mitigated Negative Declaration

Conditional Waiver of Waste Discharge Requirements
For Dairy Operations at the
Mello 3/Llano Oaks Dairy

September 28, 2015

California Regional Water Quality Control Board, North Coast Region
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

Prepared By:
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1. Project Information

a. Project Title

Conditional Waiver of Waste Discharge Requirements for Dairy Operations at Mello 3/Llano Oaks Dairy

b. Lead Agency Name & Address

North Coast Regional Water Quality Control Board (Regional Water Board)
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

c. Contact Person & Information

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email: Cherie.Blatt@waterboards.ca.gov

d. Project Location

Laguna de Santa Rosa watershed, tributary to the lower Russian River, Sonoma County, California at Mello 3/Llano Oaks Dairy, 3915 Llano Road (APN: 063-180-045; Longitude, Latitude: 38.376664, -122.772636). See Figure 1, Location Map Mello 3/Llano Oaks Dairy.

e. Project Sponsor's Name & Address

Mello 3/Llano Oaks Dairy – Mike Mello, 2780 Llano Road, Santa Rosa CA 95407

f. General Plan Designation

Diverse Agriculture & Land Extensive Agriculture

g. Zoning

Mello 3/Llano Oaks Dairy - Base Zoning: Diverse Agriculture (DA) and B6 40 (residential density of 6 units per acre on 40 acre parcels). Combining Districts: BH (Biotic Habitat) F1 (Floodway) F2 (Floodplain) RC50/25 (Riparian Corridor), RC200/25, SR (Scenic Resources) VOH (Valley Oak Habitat)

h. Description of Project

The project is the adoption of a Conditional Waiver of Waste Discharge Requirements (Conditional Waiver) for Mello 3/Llano Oaks Dairy located in western Sonoma County. The proposed Conditional Waiver would regulate the discharge of waste from dairy ranching operations. The Mello 3/Llano Oaks Dairy has been in agricultural production since the 1970s.

Dairy operations changed to dry ranching on the Mello property in 2005. The ranch will revert from current cattle ranching back to the dairy ranching operations. The ranch has been in continuous grazing since the active dairy operations ceased, and has existing structures to support dairy ranching. However, infrastructure for dairy operations would require repair of one existing building.

This Initial Study/Mitigated Negative Declaration evaluates the environmental impacts of physical changes resulting from possible actions to comply with the Conditional Waiver. Adoption of the Conditional Waiver would result in the use of management practices and structural controls to meet water quality requirements.

i. Surrounding Land Uses and Setting

The dairy is located in western Sonoma County, in an unincorporated area just west of the City of Santa Rosa and southeast of the City of Sebastopol. The land use in the area is largely agricultural. The wastewater treatment plant for the City of Santa Rosa is located just south of the ranch. Approximately one mile south of the project area, the predominate land use changes to rural residential. The ranch is in the Laguna de Santa Rosa Hydrologic Sub-Area (HSA), which is 303(d)[1] listed as impaired for mercury, indicator bacteria, dissolved oxygen, nitrogen, phosphorous, sediment/siltation, and temperature (NCRWQCB 2012).

j. Other Public Agencies Whose Approval may be Required

County of Sonoma may need to issue building permits for reconstruction activities.

1.1 Purpose and Need for the Project

Conversion of the ranch back to previous dairy operations requires adoption of a new Conditional Waiver under the Regional Water Board's Dairy Program. The new Conditional Waiver would establish a comprehensive plan for dairy management operations on the property similar to those prescribed in the existing Conditional Waiver of Waste Discharge Requirements, Order No. R1-2012-0003 for Existing Cow Dairies in the North Coast Region or the General Waste Discharge Requirements, Order No. R1-2012-0002 for Existing Cow Dairies in the North Coast Region. The Regional Water Board requires an individual Waiver of Waste Discharge Requirements (WDR) for Mello 3/Llano Oaks Dairy because the dairy is not covered under the Conditional Waiver of Waste Discharge Requirements, Order No. R1-2012-0003 for Existing Cow Dairies in the North Coast Region or the General Waste Discharge Requirements, Order No. R1-2012-0002 for Existing Cow Dairies in the North Coast Region. The project proposes the adoption of individual Conditional Waiver for the dairy operations at Mello 3/Llano Oaks Dairy. The following Initial Study addresses this property.

1.2 Project Location and Existing Setting

The dairy is located in the Laguna de Santa Rosa watershed, which is the largest tributary to the Russian River. The broad, flat floodplain of the Laguna retains water during the winter from the Russian River and

[1] 303(d) of the federal Clean Water Act requires states to identify waterbodies that do not meet water quality objectives and are not supporting their beneficial uses. The list identifies the pollutant or stressor causing the impairment and establishes a priority for developing a control plan to address the impairment. On July 30, 2015, the USEPA gave final approval to the 2012 List of Impaired Waterbodies (it was partially approved on June 26, 2015).

spillover from Santa Rosa Creek, storing up to 80,000 acre-feet of water (Sonoma County 2011). The floodplain supports grassland and valley oak savanna with vernal pools and dry grassland and savanna.

Colgan Creek borders the southern edge of the Mello 3/Llano Oaks Dairy, and joins the mainstem Laguna de Santa Rosa at the southwestern corner of the property.

The ranch has the infrastructure in place to reestablish dairy operations, although one building is in need of a new roof because the existing roof is in poor condition. In addition to the existing buildings, the ranch has wells, pasture irrigation systems, a manure pond, and pastures currently grazed by up to 200 dry cows, heifers and calves. The baseline conditions include these existing facilities and current land uses.

1.3 CEQA Requirements

This project is subject to the requirements of the California Environmental Quality Act (CEQA). Prior to making a decision to approve the project, the Regional Water Board must identify and document any potential significant environmental effects of the project in accordance with CEQA. This Initial Study/Proposed Mitigated Negative Declaration (MND) has been prepared by the Regional Water Board as the CEQA lead agency and is intended to fulfill the requirements of CEQA (Public Resources Code, Div. 13, §21000-21177; California Code of Regulations, Title 14, §15000-15387).

Section 15063(d) of the California Code of Regulations states the content requirements of an Initial Study as follows:

> *"§15063(d) Contents. An Initial Study shall contain in brief form:*
>
> *(1) A description of the Project including the location of the Project;*
>
> *(2) An identification of the environmental setting;*
>
> *(3) An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries;*
>
> *(4) A discussion of the ways to mitigate the significant effects identified, if any;*
>
> *(5) An examination of whether the Project would be consistent with existing zoning, plans, and other applicable land use controls;*
>
> *(6) The name of the person or persons who prepared or participated in the Initial Study."*

Section 15071 of the California Code of Regulations states that the contents of a Negative Declaration as follows:

> *"§ 15071. Contents. A negative declaration circulated for public review shall include:*
>
> *(a) A brief description of the project, including a commonly used name for the project, if any;*
>
> *(b) The location of the project, preferably shown on a map, and the name of the project proponent;*
>
> *(c) A proposed finding that the project will not have a significant effect on the environment;*
>
> *(d) An attached copy of the initial study documenting reasons to support the finding; and*
>
> *(e) Mitigation measures, if any, included in the project to avoid potentially significant effects."*

This Initial Study/Proposed MND will be circulated for public and agency comment for 30 days from September 28, 2015, to October 27, 2015. Written comments may be emailed, delivered, or mailed to the following address until close of business on October 27, 2015:

Cherie Blatt
Water Resource Control Engineer
North Coast Regional Water Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403
Email: Northcoast@waterboards.ca.gov

1.4 CEQA Baseline

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 California Code of Regulations, title 14, section 15125(a), the existing environmental setting, established at the time the Notice of Preparation is published, or if there is no Notice of Preparation, at the time environmental analysis is commenced, should normally constitute the baseline. Therefore, "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).

The Mello 3/Llano Oaks Dairy project area currently grazes cattle. In accordance with CEQA, the baseline herd size used in this environmental analysis is the herd count at the time of preparation of this Initial Study, which is approximately 200 dry cows, calves, and heifers at Mello 3/Llano Oaks Dairy. No milking cows currently graze at the property. The ranch has the infrastructure in place to reestablish dairy operations. In addition to the existing buildings, the ranch has wells, pastures, pasture irrigation systems, and a manure pond sized to accommodate the proposed herd size. The baseline condition includes this existing facility and current land use.

1.5 Project Description

The project consists of the adoption of a Conditional Waiver by the Regional Water Board for reestablished dairy operations at a ranch along Llano Road in Sonoma County, California, that currently is grazed by cattle. The Regional Water Board requires an individual Conditional Waiver for Mello 3/Llano Oaks Dairy because it is not covered under the Conditional Waiver of Waste Discharge Requirements, Order No. R1-2012-0003 for Existing Cow Dairies in the North Coast Region or the General Waste Discharge Requirements Order No. R1-2012-0002 for Existing Cow Dairies in the North Coast Region. The Regional Water Board must issue a new Conditional Waiver because dairy operations on the ranch were not active before January 19, 2012 when the current Dairy Program was established. Mello 3/Llano Oaks Dairy is operated by the Mello family. Currently, Mike Mello operates the property as a ranch, raising cattle. Mr. Mello wants to reestablish dairy operations. Figure 1, Location Map Mello 3/Llano Oaks Dairy illustrates the location of the property. The reestablishment of dairy operations on the ranch would include slight modifications to the grazing schedules and a change in the number of cows currently on the property from 200 to 370 milking plus dry and 287 other dairy cattle, on the Mello 3/Llano Oaks Dairy. The new dairy will not exceed 400 total milking, dry, or other cattle at any one time (Table 1-1).

Reestablishment of dairy operations would also include replacing a roof on a structure at the Mello 3/Llano property, potential rerouting of storm water and waste flows to maintain separation, and a change in the breed and management of the cattle on the land that would result in changes in the daily routine as described in section 1.51. The project would include adoption of a Conditional Waiver that would prescribe general and specific discharge requirements for management practices on the property intended to implement applicable water quality standards from the Water Quality Control Plan for the North Coast Region (Basin Plan) (NCRWQCB 2011). If adopted, the Regional Water Board would prescribe a Conditional Waiver for discharges, or threatened discharges, of waste including sediments (e.g., earthen materials such as soil and silt) and organic materials (e.g., manure) resulting from conversion to and ongoing operation of, dairy ranching activities. The Conditional Waiver would also prescribe the monitoring and reporting requirements.

Table 1-1, Mello 3/Llano Oaks Dairy Current and Proposed Future Cattle Numbers

Dairy	**Herd Size (maximum)**	**Dairy Cattle Type**	**Total Acres**
Current	200	Dry Cows, Heifers, Calves	Approximately 100
Future Project	370	Maximum Milking + Dry Cows	
	287	Maximum Other Dairy Cattle (Heifers, Calves, Bulls)	
	400	Total Milking + Dry + Other Dairy Cattle (not to exceed at any one time)	

Figure 1, Project Location

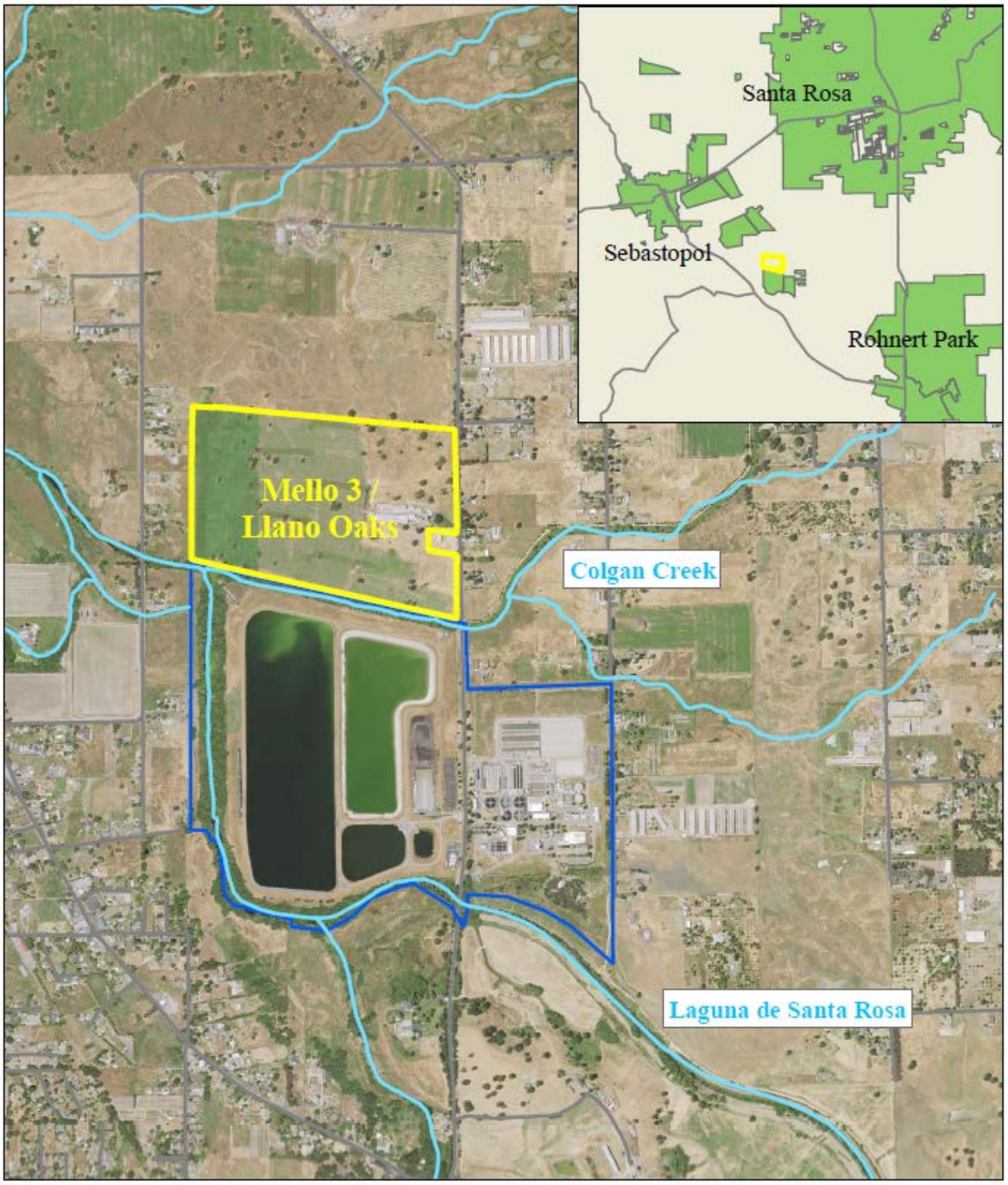


Figure 1 - Location Map
Mello 3/Llano Oaks Dairy

0 0.125 0.25 0.5 0.75 1 Miles

N

1.5.1 Mello 3/Llano Oaks Dairy

1.5.1.1 *Mello 3/Llano Oaks Dairy Operations*

The Mello 3/Llano Oaks Dairy encompasses approximately 100 acres, including pastures and the former milking facilities. The dairy would consist of a milking parlor, two freestall barns, feed storage, calf pens, two screw press separators, and a manure storage pond. The Mello family has leased the property since 2007 and currently grazes approximately 200 dry cows, heifers and calves with no active milking operations. The dairy will have a maximum of 370 Holstein and Jersey mature dairy cows (milking plus dry cows) and a maximum of 287 of other dairy cattle (heifers, claves, bulls). Including all mature dairy cows, calves, heifers, and bulls, the total maximum dairy cattle population will not exceed 400 cows on the property at any given time.

The cows would graze the pastures when the weather is favorable and conditions are dry. Typically, cows would be rotated every 2 to 5 days to a new pasture to avoid overgrazing and to optimize forage opportunities. The pastures would be managed using electrified fencing to contain and move the animals as needed. Cows would be moved to freestall barns during the wetter months, which are traditionally from November through March; however grazing may occur for a longer time in drier years and a shorter time in wetter years. Once housed in the barns, cows would be fed using feed trucked to the dairy. See Figure 2, Mello 3/Llano Oaks Dairy Site Map, and Figure 3, Mello 3/Llano Oaks Field Map.

There is one domestic well on the property, which is fenced to keep cattle away. The well currently services ranching operations and would be used for drinking water in the milking barn, water troughs, and houses located on the property. Well water would also be used to wash cows prior to milking, to clean equipment, to wash floors, and to cool the milk. It is expected that dairy operations would utilize approximately 9.7 gallons per cow per day or 2,910 gallons per day. This water flows to the manure pond which is then used to fertilize and irrigate fields. The well is not used to irrigate the pastures directly and would not be used for irrigation in the future other than the wash water that flows to the manure pond and is used to irrigate pastures.

Reclaimed water, provided by the City of Santa Rosa through a pipeline to the Subregional System, is used to irrigate pastures, and this use would continue for the dairy. Water is applied using a sprinkler irrigation system. The sprinkler system is run as needed based on visual crop assessment, and irrigation would continue once the ranch converts to dairy operations.

The two freestall barns would be used primarily for loafing and feeding. The barns would be scraped daily and manure would be directed to the storage pond. Water generated in the milking barn would also be sent to the manure pond through existing pipelines and drainage facilities. Contents of the manure pond are required to be spread evenly on the pastures in accordance with the Conditional Waiver and associated Water Quality Plan and Nutrient Management Plan.

All barns would have gutters installed to divert clean rain water away from the storage ponds and into an existing drainage ditch adjacent to the buildings, which then flows to Colgan Creek. Rainwater collected from uncovered concrete areas would drain directly into the storage pond. Existing separators would be used to remove manure solids from the wastewater, and the dry manure would be used for bedding or trucked off site.

Figure 2, Llano Oaks Dairy Site Map

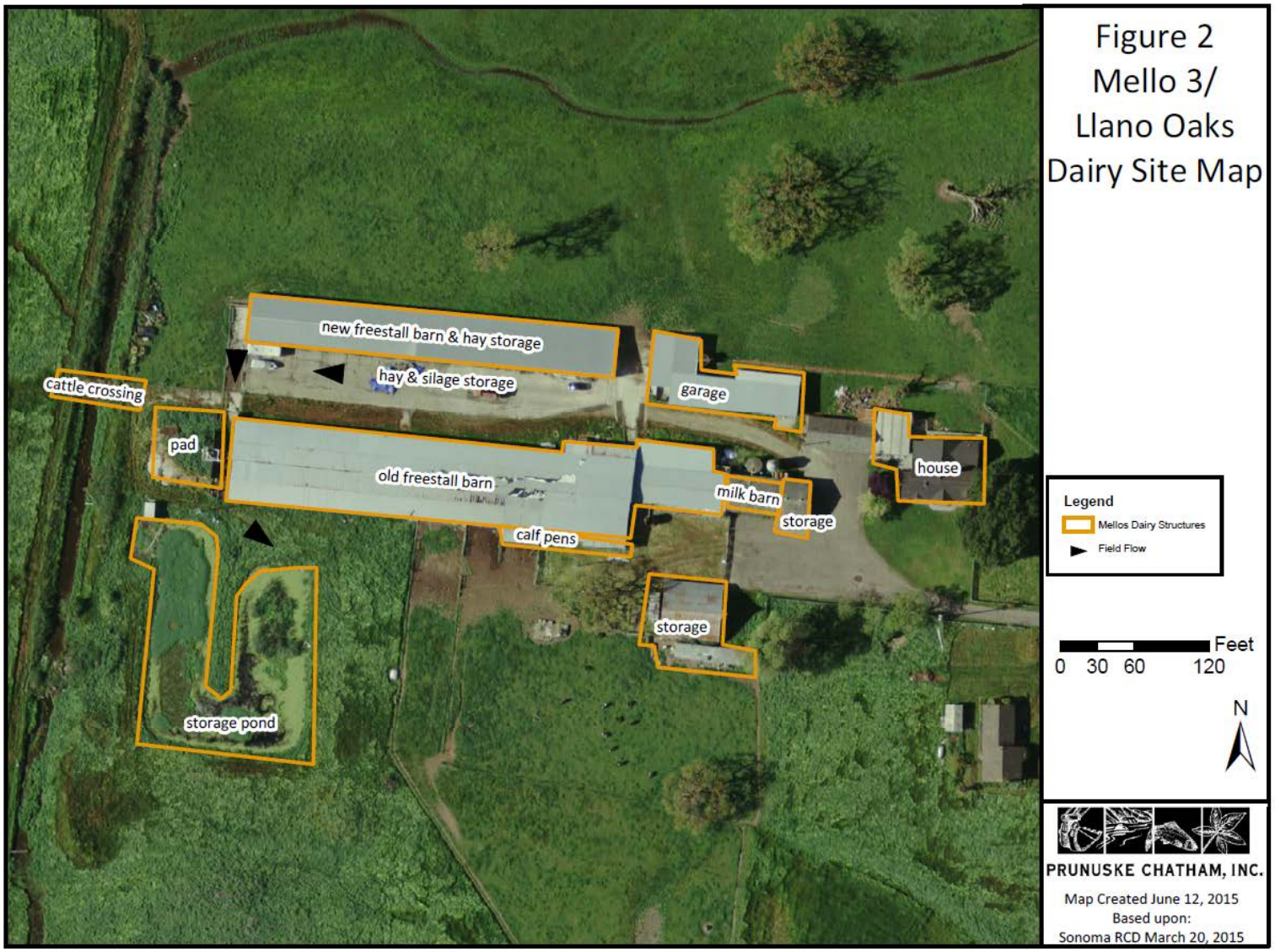
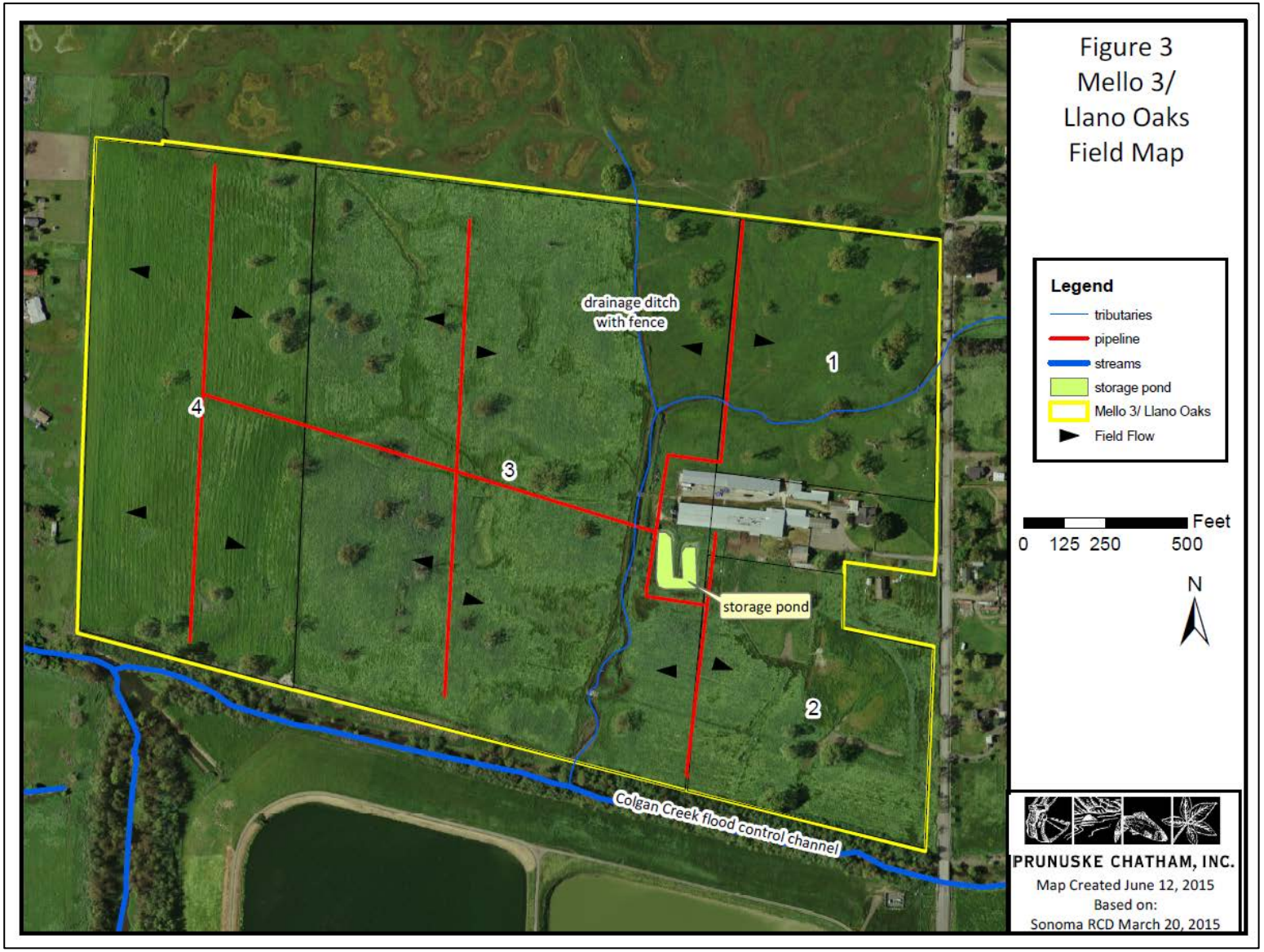


Figure 3, Llano Oaks Dairy Field Map



Based on the proposed herd size, the dairy would produce approximately 8 acre-feet of wastewater and 892 tons of manure solids annually. The existing storage pond is currently sized sufficiently to contain the wastewater produced by the proposed herd size, and no expansion of the pond would be required to contain water during a 25-year storm event (CRA 2015). An existing pump, located on the northwest corner of the storage pond, would be used to deliver wastewater to the sprinkler system. Wastewater would be applied to all fields either when the pond is full or when the crops need it for irrigation. Typically, any collected manure solids from the barns and calf pens would be exported offsite in the fall. Also, accumulated solids from the pond would be removed and either spread on-site or exported offsite. On-site application would be infrequent and only done if crops need additional nutrients. Waste would be handled according to a Water Quality Plan and Nutrient Management Plan developed specifically for the dairy (CRA 2015).

Colgan Creek Flood Control Channel, located on the southern edge of the property, is fenced to exclude cattle from the channel and from vegetation along the channel. An existing fence keeps cattle from entering a small unnamed channel located adjacent to the dairy processing facility. The same small, unnamed channel runs through the northeastern pasture, and cows would be excluded from the pasture during wet winter months and high flow periods. Existing fencing on the property would be maintained with the change to dairy operations.

1.5.1.2 *Mello 3/Llano Oaks Dairy Building Repair*

One barn has a thoroughly decayed roof that currently allows rain water to fall inside the barn and run into the manure pond. Before or at the start of the dairy milking operation project, the roof must be replaced and rain gutters added to route clean storm water past the manure ponds to the unnamed drainage that flows to Colgan Creek.

1.5.1.3 *Mello 3/Llano Oaks Dairy Truck Trips*

Cows would be milked twice a day, and one new truck trip would be added to haul the milk offsite once a day. The ranch already imports feed to the property during the winter months for the existing grazing operation, and hauling in feed would continue with the dairy. Manure, solids, and liquids from the storage ponds are either spread on the pastures or hauled offsite, and the practice would continue with the reestablishment of the dairy.

1.6 Other Public Agencies Whose Approval is Required

Conversion of the ranch back to dairy operations would require adoption of a Conditional Waiver by the Regional Water Board, and dairy operations would be conducted to meet applicable water quality requirements. Sonoma County may have permitting or approval authority over reconstruction of dairy buildings.

1.7 Regulatory Setting

Conditional Waivers are a regulatory mechanism intended to ensure that waste discharges from the reestablished dairy operations at the Mello 3/Llano Oak Dairy comply with applicable water quality requirements, primarily Water Code §13000 et seq. and the Water Quality Control Plan for the North Coast Basin.

1.7.1 California Water Code

Water Code section 13260(a) requires that any person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the State, other than into a community sewer system, must file with the appropriate Regional Water Board a Report of Waste Discharge (ROWD) containing such information and data as may be required. Under Water Code section 13263, the Regional Water Board prescribes requirements as to the nature of any proposed or existing discharge with relation to the receiving water conditions. The discharge requirements implement any relevant Basin Plan requirements and take into consideration beneficial uses and objectives reasonably required to protect such uses, and other relevant factors. Waste discharge requirements may be waived when a regional board finds, pursuant to Water Code section 13269, that a waiver of waste discharge requirements for a specific type of discharge is consistent with applicable state or regional water quality control plans and is in the public interest.

1.7.2 Water Quality Control Plan (Basin Plan)

The Basin Plan is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality standards. The Basin Plan has been adopted and approved by the State Water Resources Control Board (State Board), as well as by the United States Environmental Protection Agency (USEPA) and the Office of Administrative Law (OAL) when required. Conditional Waivers of Waste Discharge Requirements require compliance with the Basin Plan water quality objectives, prohibitions, action plans, and policies.

1.7.3 California Antidegradation Policy

In 1968, the State Water Board adopted Resolution 68-16 which states:

1. *Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*

2. *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*

Any activity that results in the degradation of the quality of waters of the state is required to employ best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and the highest quality of water will be maintained consistent with maximum benefit to the people of the state.

1.7.4 California Nonpoint Source Policy

The State Board adopted the Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy) pursuant to Water Code §13369 (a)(2)(B). The NPS Policy requires regulation of nonpoint source pollution through one, or a combination, of the following permitting authorities:

- Basin Plan prohibitions
- Waste Discharge Requirements
- Conditional Waivers of Waste Discharge Requirements

The Conditional Waiver for the Mello 3/Llano Oak Dairy would meet the requirements in the California Nonpoint Source Policy.

1.7.5 Total Maximum Daily Loads (TMDL)

Section 303(d) of the Clean Water Act (CWA) and associated regulations contain provisions for developing TMDLs for impaired waterbodies. In 1996, the USEPA approved the Laguna de Santa Rosa TMDL for high levels of ammonia and low dissolved oxygen concentrations. Regional Water Board staff is currently developing new TMDLs for indicator bacteria, nitrogen, phosphorus, dissolved oxygen, temperature, and sediment in the Laguna de Santa Rosa watershed to address continuing water quality impairments.

1.7.6 Clean Water Act (CWA)

The State and Regional Water Boards are delegated as the State agency with responsibility for implementing the federal CWA in California.

2. Determination

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

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

On the basis of this initial evaluation:

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

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

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

☐ I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an EARLIER EIR or NEGATIVE DECLARATION pursuant to applicable legal standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

_____ _____

Signature Date

_____

Name, Title

3. Environmental Effects of the Project

I. AESTHETICS Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?				X
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Discussion:

I. a & c) Adverse effect on a scenic vista or substantially degrade existing visual character or quality – No Impact

One of the most important scenic elements of western Sonoma County, typifying the scenic character of areas inland from the coast, is the open hills of grazing land with cattle roaming across them. The Mello 3/Llano Oaks Dairy is visible from Llano Road. The appearance of animals grazing would not change with reestablishment of dairy operations. Changes in ranch management, such as feeding routines, would not alter the visual character. The adoption of a Conditional Waiver and reestablishment of dairy operations would have no impact on scenic resources.

I. b) Adverse effect on scenic resources on a State scenic highway – No Impact

Mello 3/Llano Oaks Dairy is not visible from a State scenic highway or route. As described above, conversion of the property to a dairy operation would not adversely affect the scenic nature of the property. The adoption of a Conditional Waiver and reestablishment of grazing would have no impact on scenic resources on a State Scenic Highway.

I. d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area – Less than Significant

New lights may be installed on the barns to accommodate milking. These lights would be visible across the fields and potentially from the roads. However, the amount of light shed would not interfere significantly with a dark night sky or change the existing character of the night in the neighborhood. Llano Road, the closest roadway, is approximately 750 feet from the dairy structures at Mello 3/Llano Oaks Dairy. Glare from the new lights would not create substantial light or glare because of the distance from the light source to Llano Road and other buildings and vegetation blocking the view. Residences located west of the dairy are over one half mile from the milk barn. Other residences across Llano Road would not be affected by new lights on the barns since trees line the parcel boundary, and views would be partially blocked by other buildings on the dairy. The impact from new barn lights on daytime or nighttime views would be less than significant.

II. AGRICULTURE AND FOREST RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Project: (In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.)				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d. Result in the loss of forest land or conversion of forest land to non-forest use?				X
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X

Discussion:

II. a, b, c, d, e) Convert farmland/forestland or conflict with existing zoning for agricultural/forest land use – No Impact

The property would remain in agricultural use. Adoption of a Conditional Waiver related to the reestablishment of dairy operations would not result in changes to the current condition of agricultural resources. No farmlands or forest lands would be converted to nonagricultural or non-forest land uses. The project would not conflict with existing zoning for agricultural use or any Williamson Act contract. There are no forest lands in the project area.

III. AIR QUALITY Would the Project: (Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.)	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?				X
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c. 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d. Expose sensitive receptors to substantial pollutant concentrations?				X
e. Create objectionable odors affecting a substantial number of people?				X

Discussion:

III. a) Conflict with or obstruct implementation of the applicable air quality plan – No Impact

The property is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). In 2010, BAAQMD adopted the Clean Air Plan (CAP) addressing four categories of pollutants:

- Ground-level ozone and its key precursors, reactive organic gases (ROG), and total concentration of nitric oxide and nitrogen dioxide (NO_x);
- Particulate matter[2] (PM): PM_{10}, primary $PM_{2.5}$, as well as precursors to secondary $PM_{2.5}$;
- Air toxics; and
- Greenhouse gases (GHG).

The plan includes Stationary Source Measure 3 for livestock waste management practices to reduce ROG, ammonia, PM, and GHG. The measure calls for best management practices that reduce organic emissions from feed, which constitute half of organic emissions at small-scale dairies (BAAQMD 2010) and from waste streams. These best management practices are:

- Prepare feed according to National Research Council guidelines specified in the most recent version of the "Nutrient Requirements of Dairy Cattle."
- Store grain in a weatherproof storage structure from October through May.
- Remove feed from the area where animals eat at least once every 14 days.

2 Particulate matter is described as PM_{10}, particulate matter up to 10 micrometers in size, and $PM_{2.5}$, particulate matter smaller than 2.5 micrometers.

- Cover the horizontal surface of silage piles, except for the area where feed is being removed from the silage pile.
- Flush or hose milking parlor immediately prior to, immediately after, or during each milking.
- Flush freestalls more frequently than the milking schedule.
- Use non-manure-based bedding for at least 90% of the bedding material, by weight, for freestalls (e.g., rubber mats, almond hulls, sand, or waterbeds).
- Inspect water pipes and troughs and repair leaks at least once every 14 days.
- Clean concrete areas such that the depth of animal waste does not exceed 12 inches at any point or time, except in-corral mounding.
- Manage corrals such that the animal waste depth in the corral does not exceed twelve inches at any point or time, except for in-corral mounding.
- Knock down fence line animal waste build-up prior to it exceeding a height of 12 inches at any time.
- Scrape or flush feed aprons in corrals at least once every 7 days.
- Maintain corrals to ensure drainage and to prevent water from standing more than 48 hours.
- Cover dry animal waste piles outside of the corrals with a waterproof covering from October through May, except for times, not to exceed 24 hours, when wind removes the covering.
- Cover dry separated solids outside the corrals with a waterproof covering from October through May, except for times, not to exceed 24 hours, when wind removes the covering.
- Remove solids from the waste system with a solid separator system prior to the waste entering the lagoon.
- Manage the liquid animal waste so it stands in the fields no more than 24 hours if it is applied on land as fertilizer.
- Do not apply any solid animal waste that has a moisture content of more than 50% as fertilizer on fields.

The rancher already implements management practices that meet, and usually exceed, these standards. Dairy operations would be in full compliance with the CAP. No impact would occur.

III. b & c) Violate any air quality standard or contribute substantially to an existing or projected air quality violation or result in a cumulatively considerable net increase of any criteria pollutant – Less than Significant

Chemicals with potential basin-wide effects are regulated under the federal Clean Air Act (CAA) in two groups: 1) toxic air contaminants with immediate, acute toxicity effects and 2) criteria pollutants that are common chemicals with long-term health effects. Acutely toxic chemicals are problematic at any concentration; however, the effect of criteria contaminants depends on the amount of exposure over time. Accordingly, the USEPA sets limits on maximum atmospheric concentration for each pollutant. The State of California is required to use these limits but may also set higher standards when the California Air Resources Board (CARB) determines that tighter limits would protect human health. See Table III-1 below for State and federal standards and whether the Bay Area is currently meeting those standards.

Table III-1, Bay Area Air Quality Management District Summary of Ambient Air Quality Standards and Attainment, 2015

Pollutant	Averaging Time	California Standards [1]		National Standards [2]	
		Concentration	Attainment Status	Concentration[3]	Attainment Status
Ozone (O_e)	8-hour	0.070 ppm (137 µg/m^3)	N	0.075 ppm	N[4]
	1-hour	0.09 ppm (180 µg/m^3)	N		*See Note 5*
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	A	9 ppm (10 mg/m^3)	A[6]
	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	A
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m^3)	A	0.100 ppm; *See Note 11*	U
	Annual Arithmetic Mean (AAM)	0.030 ppm (57 µg/m3)		0.053 ppm (100 µg/m3)	A
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m3)	A
	1-hour	0.25 ppm (655 µg/m^3)	A	0.075 ppm (196 µg/m3)	A
	AAM			0.030 ppm (80 µg/m3)	A
Particulate Matter (PM_{10})	AAM	20 µg/m^3	N[7]	50 µg/m^3 [f]	
	24-hour	50 µg/m^3	N	150 µg/m^3	U
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	N[7]	15 µg/m^3	U/A
	24-hour	No Standard		65 µg/m^3	N
Sulfates	24-hour	25 µg/m^3	A		
Lead	30-day Avg.	1.5 µg/m^3		-	A
	Quarter	-		1.5 µg/m^3	A
	3-month Avg[14]	-		0.15 µg/m^3	*See Note 14*
Sulfates	24-hour	25 µg/m^3		No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U[16]		
Vinyl Chloride	24-hour	0.010 ppm (26 µg/m^3)			
Visibility Reducing Particles (VRP)	8-hour	*See Note 8*	U		

Source: Bay Area Air Quality Management District 2015

Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded.
2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less.

The 24-hour PM10 and PM2.5 standards are attained when the 3-year average of the 99th percentile of monitored concentrations equal to or less than the standard.

3. National air quality standards are set by US EPA at levels determined to be protective of public health with an adequate margin of safety.
4. Final designations effective July 20, 2012.
5. The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.
6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
7. In June 2002, CARB established new annual standards for PM2.5 and PM10.
8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
10. On January 9, 2013, the USEPA issued a final rule to determine that the Bay Area attains the 24-hour PM2.5 national standard. This USEPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area will continue to be designated as "non-attainment" for the national 24-hour PM2.5 standard until such time as the Air District submits a "redesignation request" and a "maintenance plan" to USPA, and USEPA approves the proposed redesignation.
11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).
12. On June 2, 2010, the USEPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO2 NAAQS however must continue to be used until one year following USEPA initial designations of the new 1-hour SO2 NAAQS. USEPA expects to designate areas by June 2012.
13. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure below which there are no adverse health effects determined.
14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.
15. In December 2012, USEPA strengthened the annual PM2.5 National Ambient Air Quality Standards (NAAQS) from 15.0 to 12.0 micrograms per cubic meter (µg/m3). In December 2014, USEPA issued final area designations for the 2012 primary annual PM2.5 NAAQS. Areas designated "unclassifiable/attainment" must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.
16. Unclassified – attainment status for pollutant has not been designated, considered attainment for regulatory purposes.

Adoption of a Conditional Waiver and reestablishment of dairy operations would not change the air contaminant emissions generated by vehicle emissions, particulate matter from driving on unpaved ranch roads, emissions of solvents from cleaning and maintenance activities, or air emissions from animal waste. Operation of the dairy would increase milk truck vehicle trips to and from the dairy by one trip per day. The number of vehicles and the cleaning and maintenance activities would otherwise remain the same as current operations.

Dairy operations would not generate chemicals identified by the State of California as toxic air contaminants (CARB 2011) except for particulate emissions from diesel engines. Since the standards for particulate emissions are regulated under criteria pollutants, this analysis addresses only criteria pollutants. Of the new or expanded dairy activities, the one that would increase criteria pollutants is the increase of one milk truck trip per day. Increased use of electricity also has the capacity to generate criteria pollutants when it is produced by burning fossil fuels. However, electric power in Sonoma County comes largely from the Geysers and other renewable, largely clean, sources. Effects of increase electrical use are discussed in the GHG section and would not have an effect on local concentrations of criteria pollutants.

Vehicles produce carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and ozone precursors. Of these pollutants, the Bay Area is nonattainment for ozone and particulate matter. However, the project would increase milk truck vehicle

use by approximately one vehicle per day. Comparing an increase of approximately one vehicle to the 416,480 on- and off-road vehicles already operating in Sonoma County (DMV 2009), this comprises an increase of approximately 0.0002%, which is not a substantial increase in criteria pollutants. The impact on air quality from the adoption of a Conditional Waiver related to the reestablishment of dairy operations would be less than significant.

III. d & e) Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people – No Impact

Dairy operations at the ranch would not expose sensitive receptors to pollutants because cattle currently graze on the ranch, and the ranch has an existing manure pond. Manure is spread on the fields currently, and the practice would continue with the reestablishment of dairy operations. Cattle would move from the pastures to the milking barn two times per day. Once milked, the cows would return to the pasturelands to graze. Manure amounts would increase slightly at the dairy; however, manure management would continue and no new composting areas or manure ponds would be developed. No new areas would be exposed to odors and no increase in objectionable odors is anticipated, and, thus, there would be no impact.

IV. BIOLOGICAL RESOURCES Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				X
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?			X	
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

Discussion:

On May 18, 2015, biologists conducted a site assessment of the Mello 3/Llano Oaks property. The purpose of the visit was to characterize natural resources present on the property and to identify the potential presence of any sensitive species or habitat types potentially affected by the adoption of the Conditional Waiver related to the reestablishment of dairy operations. A review of background information, including aerial imagery and the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Wildlife, was done prior to the site visit. The CNDDB is a repository of information on sightings and collections of rare, threatened, or endangered plant and animal species within California. CNDDB reports occurrences of special-status species that have been entered into the database and does not generally include inventories of more common animals or plants. In addition to the CNDDB, other databases (e.g., U.S. Fish and Wildlife Service, California Native Plant Society) and general references were also consulted to evaluate the potential for additional unique biological communities and special-status species. The search focused on CNDDB-reported occurrences

for the Two Rock and Sebastopol 7.5' USGS quadrangles where the property is located and surrounding quads, and those species identified as having a high likelihood of occurrence in the background reports.

The Mello property has been in agricultural production since the 1970s. Throughout the history of this dairy, agricultural production has included grazing, crop production, fertilizer application, and infrastructure development with other associated uses. While the number of animals grazing could increase, rotational grazing, cows/acre, and frequency of grazing, as well as the housing of animals in the barn during the wetter winter months, would result in a grazing impact similar to existing baseline conditions. The existing footprint of the current cattle grazing operation would remain the same for the proposed conversion to dairy farming on the property.

Habitat on this property consists of valley oak (*Quercus lobata*) savanna and grassland used for pasture and hay production, seasonal wetlands, and drainages. Existing dairy facilities (barns and a manure lagoon) are present on its central eastern portion. On its south side, the ranch abuts a channelized section of Colgan Creek, which joins the Laguna de Santa Rosa just beyond the southwestern corner of the property. A broad, grassy swale within the main pasture area drains south into the creek. Dense riparian vegetation is present along the channel, just beyond the property boundary, on lands owned by the City of Santa Rosa and the Sonoma County Water Agency. On the north, the property abuts the Carinalli-Todd Road Mitigation Bank, which includes created and restored vernal pools and supports endangered vernal pool species [California tiger salamander, Sonoma sunshine (*Blennosperma bakeri*), and Sebastopol meadowfoam (*Limnanthes vinculans*)]. Cattle owned by the Mellos do not have access to the Carinalli-Todd Road Mitigation Bank. The north Mello property that abuts the mitigation bank is currently grazed and grazing would continue with the change to dairy operations.

Most of the herbaceous vegetation on the property has been highly managed for ranching, with regular tilling and planting of forage species including Italian rye (*Festuca perennis*) and non-native clovers (*Trifolium* spp.). Mature valley oaks are present throughout the property, as well as some standing dead trees, but no natural regeneration was apparent during the site visit. Remnant vernal pools and swales are present, but, because of long-term agricultural use, very little native vegetation was observed. Some pools along the northern boundary straddle the fence line between the Mello property and the Carinalli-Todd Road Mitigation Bank. The only native vernal pool plant species observed was California semaphore grass (*Pleuropogon californicus*), which is common in pools throughout the Santa Rosa Plain. Other species present in swales and pools were common non-natives of disturbed, seasonally wet habitat, including pennyroyal (*Mentha pulegium*), flatsedge (*Cyperus eragrostis*), cocklebur (*Xanthium spinosum*), and dock (*Rumex* sp.). A dense infestation of purple starthistle (*Centaurea calcitrapa*) is present in a heavily grazed pasture south of the dairy buildings.

A cement-lined drainage channel runs north-south, just west of the dairy buildings. A small stand of willows (*Salix lasiolepis*) is present along a portion of the channel, and common non-native wetland species are present within the channel. A dense patch of invasive Himalayan blackberry (*Rubus armeniacus*) is present.

The riparian vegetation south of the property includes native arroyo willow (*Salix lasiolepis*), valley oak, and cottonwood (*Populus fremontii*), as well as dense non-native stands of poison hemlock (*Conium maculatum*), Himalayan blackberry, and Harding grass (*Phalaris aquatica*). The existing trees along the southern boundary would be retained and no trimming would occur beyond the existing property boundary.

IV. a) Impacts to candidate, sensitive and special-status species – No Impact

The goal of the Conditional Waiver for the cow dairy is to establish requirements to conduct dairy operations in compliance with applicable water quality standards and regulations; requirements are also designed to protect riparian habitat and aquatic species. The Conditional Waiver would require the dairy operations to be conducted in a manner that complies with applicable water quality standards. The practices would include protection and restoration of the beneficial uses of water, including those that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or federal laws as rare, threatened, or endangered.

The Conditional Waiver would include a wide range of specific requirements designed to prevent or minimize either direct or indirect adverse impacts to in-stream and riparian habitat. Existing fencing on the property prevents cattle from entering riparian areas along an unnamed channel and Colgan Creek on the Mello property to protect riparian-dependent species that occupy the area. Pastures used for grazing on the property do not support riparian vegetation. The reestablishment of dairy operations would not result in impacts to riparian vegetation or special-status species because the Conditional Waiver would require that the fencing be maintained to exclude cattle from the sensitive riparian areas.

The production area for Mello 3/Llano Oaks Dairy drains to the manure storage pond. This area is in the Colgan Creek watershed. Existing riparian vegetation along the channels and the distance between the production areas and the channels would protect water quality and aquatic special-status species. Additionally, water quality measures mandated in the Conditional Waiver would further protect water quality in Colgan Creek and the Laguna de Santa Rosa. The Regional Water Board would include the following to protect water quality: 1) require appropriately sized manure ponds to prevent overflow of water during storm events, 2) prohibit discharge of sediments and nutrients from compost and manure areas to surrounding surface waters, 3) prevent recycled water used for irrigation from running off and entering surface waters, and 4) prevent manure and sediment from entering waterways bridged by cattle crossings.

While the Conditional Waiver would not be explicitly designed to mitigate potential impacts on terrestrial species, approval of the Conditional Waiver and implementation of covered activities would not alter current conditions at the dairy, and the current conditions do not result in impacts on special status terrestrial animals. Therefore, issuance of the Conditional Waiver and reestablishment of dairy operations would have no impacts to special status terrestrial animals.

Special-status Plants

<u>Vernal pool plants</u>

Several listed vernal pool plant species are reported within the Laguna de Santa Rosa and habitats surrounding the Mello 3/Llano Oaks Dairy property. They include, but are not limited to, three federally listed species (Sonoma sunshine, Burke's goldfields, and Sebastopol meadowfoam) and additional species of local concern (e.g., California Native Plant Society-listed species). Vernal pools and wetland habitats on the property are unlikely to support populations of listed plants given the current condition and historical land uses. Current ranching operations on the property includes seasonal grazing within wetlands and the application of manure nutrients and soil amendments such as lime and gypsum. Under the dairy operations, the seasonal use of these areas would remain the same. The reestablishment of dairy operations would not result in new impacts on listed plants, as no new areas would be grazed or

otherwise impacted. Additionally, cattle are excluded from entering riparian areas along the unnamed channel, Colgan Creek, and the Laguna. Based on the present habitat, current and future grazing on the site, and lack of access by cattle to the riparian areas, no special-status plant species would be affected by the adoption of the Conditional Waiver related to the reestablishment of dairy operations.

Special-status Wildlife

California tiger salamander

Based on the field survey and background review, California tiger salamander (CTS) breeding and upland habitats were identified in the vicinity of the Mello 3/Llano Oaks Dairy. Adult occurrences of CTS were reported on the east side of Llano Road, east of the Mello 3/Llano Oaks Dairy, and at the Walker Avenue Mitigation Bank, east of the Mello property. CTS may utilize the Mello property as upland and migration habitat. Wetlands on the Mello property appear to be too shallow to support CTS breeding. Current operations on the Mello property include seasonal grazing within the wetland areas, manure application, and irrigation. Under the reestablished dairy operation, seasonal grazing would continue. Manure application rates and irrigation would also continue and the manure application rates could vary depending on the estimated crop needs to support the proposed grazing. Currently, cattle are grazed during the drier months and are housed and fed in the barn during the wetter winter months. While the number of animals grazing would increase, CTS migration and breeding occur during the winter months when the cows would be not be grazing outside. The adoption of the Conditional Waiver related to the reestablishment of dairy operations would not result in impacts to CTS because no new areas would be grazed or included in future dairy operations.

IV. b & c) Impacts to riparian habitat and jurisdictional wetlands and waters of the U.S. –Less than Significant

Adoption of the Conditional Waiver and reestablishment of dairy operations on the Mello 3/Llano Oaks Dairy would not change the current conditions of the riparian habitat or wetlands on the property. Currently, grazing occurs seasonally in pastures on the property, and the pastures have wetlands and vernal pools in them as well as riparian habitat along an unnamed channel, Colgan Creek, and the Laguna de Santa Rosa. Existing fencing, along the perimeter of the property and along riparian areas within the property, excludes cattle from grazing in riparian habitats. Use of electric fencing would continue as part of grazing management to provide optimal forage opportunities and minimize damage from grazing, including grazing in vernal pools. The impacts to riparian habitats and jurisdictional wetlands and waters would remain less than significant.

IV. d) Impact on movement of native residents or migratory fish or wildlife species - Less than Significant

Adoption of the Conditional Waiver and the conversion to dairy operations on the property would not interfere with the movement of any native or resident fish or wildlife species. As part of the dairy operations, external fencing would remain the same, and conditions would not change from current conditions. The management of internal fencing for rotational grazing would occur more frequently to provide optimal forage opportunities for the cows but would occur in a manner that is consistent with current operations (e.g., fencing type and location). Current operations do not prevent fish or wildlife migration, and the impact from the conversion to dairy operations would remain less than significant.

IV. e & f) Conflict with local policies or ordinances protecting biological resources or conflict with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan – No Impact

Adoption of the Conditional Waiver and reestablishment of dairy operations would not conflict with local policies or ordinances protecting biological resources or conflict with other plans. The property is located within an area covered by the U.S. Fish and Wildlife Service's Santa Rosa Plain Conservation Strategy for California tiger salamander (Strategy). The Strategy was adopted in 2005 to protect federally listed California tiger salamander and five species of federally listed vernal pool plants; the Strategy:

- Identifies potential impacts on listed species from development activities.
- Establishes preserves for species protection.
- Designates priority areas for development, conservation, and mitigation based upon habitat value and surrounding existing uses.
- Provides standards for acceptable land management within the Strategy area.

The Strategy identifies grazing as an appropriate management practice for habitat preserves:

> *Management of the vegetation on the site may require numerous techniques to reduce or eliminate exotic, competing, or undesirable plant species. These techniques should be compatible with listed plants. These techniques will include an appropriate grazing regime or mowing.*

The Mello 3/Llano Oaks Dairy is identified as being within 1.3 miles of active CTS breeding habitat and is adjacent to a preserve on the north edge of the ranch. CTS generally do not utilize floodplain habitat. Pastures outside the floodplain provide upland habitat, and the property is on the far western boundary of CTS critical habitat. The pastures are tilled and grazed currently, and both practices would continue with adoption of the Conditional Waiver and reestablishment of dairy operations. Continued grazing of the pastures would not conflict with the Santa Rosa Plain Conservation Strategy as grazing is a consistent practice.

The Sonoma County General Plan (Sonoma County 2013) identifies the ranch as diverse agriculture and includes a number of goals and policies associated with biological resources and biotic habitat areas. The adoption of the Conditional Waiver and reestablishment of dairy operations would not conflict with the policies since the dairy operations would be conducted to protect water quality and riparian habitats. Trees would not be removed within existing riparian areas, riparian corridors would continue to be protected, water quality protection measures would be implemented, and grazing would be conducted in a manner designed to protect local resources; therefore, there would be no conflicts with local plans.

V. CULTURAL RESOURCES Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				X
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?			X	
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	
d. Disturb any human remains, including those interred outside of formal cemeteries?			X	
e. Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Section 21074 of the Public Resources Code?			X	

Discussion:

Archival Records Search Results

To obtain information on any recorded cultural resources sites and to help predict the potential for the presence of unknown resources, an archival records search at the Northwest Information Center (NWIC) of the California Historical Resource Information System was completed for the property in 2015. The search results identified one previous cultural resources study within ¼ mile of the Mello property: *A Cultural Resources Evaluation of 84.2 acres located at 3915 Llano Road, Santa Rosa, Sonoma County, A.R.S. Project 08-022* (2008 Archeology Report for Mello).

Native American Tribal Contacts

The Native American Heritage Commission (NAHC) was contacted on May 15, 2015, to request a review of the sacred lands file for the presence of resources within or near the property and to request a list of tribal representatives who may have knowledge of resources within the area. On July 10, 2015, the Regional Water Board received a reply from NAHC with the tribal representatives list. On July 21, 2015, the Regional Water Board sent letters to the tribal representatives on the list notifying them of the proposed project, and requesting information on any resources that may be impacted. A project description and map were included in the letters. On July 24, 2015, Regional Water Board received an email response from a tribal representative of the Federated Indians of Graton Rancheria requesting to discuss the project in more detail and review of cultural resources reports and surveys. A general letter addressed to “Agency Representative,” dated July 1, 2015, was attached to the email from the Federated Indians of Graton Rancheria. This general letter requests formal notice and information on the proposed project and states that the tribe may request consultation and mitigation. Regional Water Board staff had a conference call with the tribal representatives on July 28, 2015. Additional project information was sent to the tribe per their request. Regional Water board staff met with the tribal representative in person on September 1, 2015. On September 14, 2015, tribal representatives and archeologist visited Mello 3/Llano Oaks Dairy.

V. a) Historical Resources – No Impact

A July 6, 2015, letter to the Mello project consultant from the Northwest Information Center, Sonoma State University, regarding the project states that: *"The State Office of Historic Preservation Historic Property Directory (OHP HPD) (which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Interest, and the National Register of Historic Places) lists no recorded buildings or structures within the proposed project areas. In addition to these inventories, the NWIC base maps show no recorded buildings or structures within the proposed project areas."*

Review of historical literature and maps give an indication of the possibility of historic-period archaeological resources within the dairy sites. The 1935 USGS Sebastopol 15-minute quadrangle depicts buildings or structures within the proposed project area. There is a moderate potential of historic-period archaeological resources at the dairy.

At Mello 3/Llano Dairy Oaks, a roof will be replaced on an existing barn in the summer or fall of 2015. This activity does not involve alteration of historical resources. No other building construction, reconstruction, or removal is proposed to convert back to dairy operations on the project site. Any future building removal or reconstruction, not associated with this project, would require further evaluation to determine if the building(s) is an historic-period archaeological resource. Dairy operations and grazing would not result in changes to baseline conditions associated with historical resources and therefore no impacts on historic resources would occur from the adoption of the Conditional Waiver.

V. b, c, d) Archaeological, paleontologic resources, human remains, tribal cultural resources – Less than Significant

Based on an evaluation of the environmental setting and features associated with known archaeological sites, Native American resources in this part of Sonoma County have been found near sources of water (including perennial and intermittent springs and streams) and near the interface between valleys and adjacent uplands. The dairy is located adjacent to the main channel of the Laguna de Santa Rosa and Colgan Creek, and portions of the dairy are located within alluvial fan deposits on the Santa Rosa Plain.

Results of the database search indicate that 27 cultural resource studies were conducted in and around the project area between 1973 and 2013. The search results identified one previous cultural resources study within ¼ mile of the Mello property, *A Cultural Resources Evaluation of 84.2 acres located at 3915 Llano Road, Santa Rosa, Sonoma County, A.R.S. Project 08-022* (2008 Archeology Report for Mello). In addition, tribal representatives and archeologist from the Federated Indians of Graton Rancheria visited the Mello property. No archaeological, paleontological, human remains, or tribal cultural resources were identified on the Mello property.

Operation of the dairy ranch would be conducted in the same manner and locations as grazing occurs today. No new areas would be grazed and no soil excavation would occur as part of the dairy conversion or with adoption of the Conditional Waiver. An increase in herd size while grazing would not result in increased compression of the ground and would therefore not impact undiscovered or undocumented buried cultural resources. It is unlikely that the project would lead to exposure of unknown buried tribal cultural resources because the increase in herd size is not significant from current conditions and rotational grazing would continue on the property. Therefore, any impact would not differ significantly from baseline conditions of current grazing and would be less than significant.

In the event that grazing or other dairy operations uncover previously undiscovered or undocumented resources, California law protects Native American burials, skeletal remains, and associated grave goods regardless of the antiquity and provides for the sensitive treatment and disposition of those remains (Health & Safety Code, section 7050.5; Public Resource Code, section 5097.9 et seq).

A roof would be replaced on an existing barn at Mello 3/Llano Dairy Oaks; no archaeological resources, paleontologic resources, human remains, or tribal cultural resources were identified at this location. Construction activities would not require excavation or grading, and movement of construction vehicles would be on established roadways. Any changes associated with the placement of materials or disposal bins during construction would not lead to ground disturbance and so any impact on undiscovered and unidentified archeological, paleontologic resources, or tribal cultural resources would be less than significant.

Human Remains: California Health and Safety Code Section 7050.5 states that it is a misdemeanor to knowingly disturb human remains. If human remains are encountered, work shall halt in the vicinity and the County Coroner shall be notified. At the same time, a qualified archaeologist shall be contacted to evaluate the discovery. If human remains are of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24 hours of identification, pursuant to Public Resources Code section 5097.98 and California Code of Regulations, title 14, section 5064.5(e). The Native American Heritage Commission will identify the person or persons most likely descended from the deceased. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

No historical, archaeological, paleontological, human remains, or tribal cultural resources were identified on the Mello property. Furthermore, the potential to cause a substantial adverse change in the significance of a an undiscovered or undocumented historical, archaeological, paleontological, or tribal cultural resource and the potential to disturb any human remains, including those interred outside of formal cemeteries is less than significant.

VI. GEOLOGY AND SOILS Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii. Strong seismic ground shaking?				X
iii. Seismic related ground failure, including liquefaction?				X
iv. Landslides?				X
b. Result in substantial soil erosion or the loss of topsoil?		X		
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

Discussion:

VI. a.i, ii, iii, iv) Fault rupture, strong seismic ground shaking, seismic-related liquefaction, and landslides– No Impact

Fault Rupture

According to the most recent Alquist-Priolo Earthquake Fault Zoning Maps, the project area is not within a designated Fault Rupture Hazard Zone. The Rodgers Creek Fault, which runs along the eastern edge of the Santa Rosa Plain, is about four miles away. The risk of surface rupture is considered low. Since this project either does not change structures or replace older structures in their original footprint with ones built to current codes, it would do nothing to increase the risk of damage from fault rupture. Therefore, the adoption of the Conditional Waiver and reestablishment of dairy operations would have no impact on hazards associated with fault rupture.

Strong Ground Shaking

Potential ground shaking in the area could range from light to violent, with the most severe ground shaking occurring from an earthquake originating on the San Andreas and the Rodgers Creek faults (ABAG 2015). Ground shaking is the most widespread effect of earthquakes, and it poses a greater seismic threat than local ground rupture in this area. The projects would not change the potential hazards of ground shaking at the ranch, except to render barns that need to be refurbished more earthquake safe. Therefore, the reestablishment of dairy operations would have no impact on hazards associated with strong ground shaking.

Seismic-related Ground Failure including Liquefaction

A portion of the ranch has moderate to high potential for liquefaction during a strong earthquake (ABAG 2015). The potential for liquefaction is highest adjacent to the Laguna de Santa Rosa. As these areas do not have buildings or structures and is only used for grazing, there is little hazard associated with it liquefying. The adoption of the Conditional Waiver and reestablishment of dairy operations would not change the likelihood of liquefaction occurring. No barns or structures would be damaged if liquefaction were to occur in the pasturelands.

Landslides

The project area is largely flat with little or no potential for the formation of landslides. There would be no impact from landslides.

VI. b) Soil erosion and loss of top soil – Less than Significant with Mitigation

According to the Sonoma County Soil Survey (1972), there are seven soil types identified on the ranch; see Figure C-1 in Appendix C.

- Clear Lake clay, ponded, with 0 to 2 percent slopes, moderately to very slowly permeable, slightly to highly expansive, highly corrosive to untreated steel and concrete, with fair to poor soil strength, and very low liquefaction potential.
- Cotati fine sandy loam, 2 to 9 percent slopes, moderately well drained with slow to rapid runoff potential, moderate erosion potential.
- Cotati fine sandy loam, 9 to 15 percent slopes, moderately well drained with slow to rapid runoff potential, high erosion potential.
- Cotati fine sandy loam, 15 to 30 percent slopes, moderately well drained with slow to rapid runoff potential, high erosion potential.
- Haire fine sandy loam, hummocky, 0 to 5 percent slopes, moderately well drained clay loams with clay subsoil and underlain by old terrace-alluvium, moderate drainage, and a very low to moderately low capacity to transmit water, high erosion potential, moderate to high shrink-swell potential, moderate-high corrosivity, and medium compressibility.
- Wright loam, wet, 0 to 2 percent slopes, moderately to very slowly permeable, slightly to highly expansive, highly corrosive to untreated steel and concrete, with fair to poor soil strength, very low liquefaction potential, and low erosion hazard.
- Wright loam, shallow, wet, 0 to 2 percent slopes, moderately to very slowly permeable, slightly to highly expansive, highly corrosive to untreated steel and concrete, with fair to poor soil strength, very low liquefaction potential, and low erosion hazard.

The adoption of the Conditional Waiver would not involve earth-moving activities and would not result in substantial soil erosion or the loss of topsoil. However, grazing activities could result in topsoil loss or erosion if pastures are overgrazed and managed poorly. The rancher currently grazes approximately 200 dry cows, heifers, and calves. Grazing could cause erosion and loss of topsoil or have little overall effect depending on the intensity (cows/acre and grazing time per pasture), forage plant quantity and quality, rainfall, soil type, and grazing management.

The rancher intends to utilize rotational grazing using mobile electric fences. Rotational grazing can reduce soil erosion if managed properly. At Mello 3/Llano Oaks Dairy, the herd would be increased to a maximum of 400 dairy cattle. The rancher would supplement grazing with silage as needed when pasture grasses are low. Nonetheless, the potential for soil erosion and loss of topsoil exists with increased cattle numbers.

The Conditional Waiver would include requirements to protect against erosion, sedimentation, and subsequent water quality problems. Soil loss would be mitigated through rotational grazing, maintaining the proper number of cows/acre, and establishing grazing times that are based on soil type, and other controls such as proper maintenance of drainage systems. Therefore, the impact would be mitigated to less than significant.

VI. c, d) Liquefaction, unstable or expansive soils – No Impact

Soils in the area have a moderate likelihood of liquefaction not induced by earthquake (ABAG 2015). As more cows graze the land, more waste would go into the waste management ponds. Ponds at Mello 3/Llano Oaks Dairy would be cleaned annually. The Sonoma County Soil Survey (1972) identifies three soil types present on the ranch that vary from slightly to highly expansive. However, increased waste in waste management ponds and reestablishing dairy operations on the ranch would have no effect on expansive soils. No impact from unstable or expansive soils or from liquefaction are anticipated from reestablishment of dairy operations.

VI. e) Septic tanks or alternative wastewater disposal systems – No Impact

The project would not involve changes to the existing septic system on the property. The ranch has a wastewater pond for manure management, and an existing septic system for wastewater disposal for the residential portion of the property. The existing septic system would continue to be used for toilets and sinks in the milking barns.

The wastewater pond would be managed according to the Water Quality Plan developed for the ranch as required in the Conditional Waiver. No additional alternative wastewater disposal systems would be constructed to reestablish dairy operations, and no impact would occur.

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

VII. a) Generate greenhouse gas emissions – Less Than Significant

Worldwide approximately 18 percent of human-induced greenhouse gas (GHG) emissions come from agriculture, with 14.5 percent from livestock (FA0 2013). Of the GHGs from livestock, 61 percent come from cattle. Ranch operations generate direct GHG emissions from vehicles, energy use, feed production, water movement for irrigation, washing, waste management, animal feed and waste products, and direct animal emissions. In addition, production of animal feed offsite generates emissions from the use of farm equipment, pesticides and herbicides, and water movement for irrigation to grow the crops, as well as from the transportation and refrigeration necessary to get beef and dairy products to processing facilities and to market.

The specific gases produced from dairy operations include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons (HFCs) for refrigeration. Different GHGs produce different amounts of heat trapping per molecule (called forcing) and, therefore, have different contributions to the changing climate. To allow for easy comparison of the environmental impacts of different GHGs, they are all reported as global warming potential in CO_2E, the equivalent amount of climate forcing[3] if it were all in CO_2. Table VII-1 shows the relative climate forcing over a 100-year period of GHGs generated by cattle ranching.

Table VII-1, Climate Forcing Induced by Greenhouse Gas Emissions

Greenhouse Gas	Global Warming Potential (GWP)
Carbon Dioxide	1
Methane	25
Nitrous Oxide	298
Hydrofluorocarbons	140 – 11,700 depending on the particular gas

Source: USEPA 2015.

For this project, increased GHGs would occur due to an increased number of cattle, the slightly increased vehicle traffic, and the increased power usage with reestablishment of the milking operations. The

3 Climate forcing is any influence on climate that originates from outside the climate system itself. The climate system includes the oceans, land surface, cryosphere, biosphere, and atmosphere.

increase in vehicle use by one truck trip per day would not substantially increase climate forcing because it is a minor contribution. Power for milking operations would be provided by Sonoma Clean Power, which results in substantially less GHG emissions than other power providers.

GHG increases would be produced by the increased number of cows and the methane and nitrous oxide they produce. Factors determining the amount of these gases produced include freshness of any silage used to enrich feed (older silage off-gases more than very fresh food), the quality of the feed (lower quality feed generates more methane), and the management of manure. Each cow, depending on management factors, may produce between 70 and 120 kilograms (kg) of methane per year (FAO 2013); therefore, the potential GHG emission increases resulting from the increase in the number of cows grazed could produce 10 to 18 tonnes of additional methane a year (263 to 450 tonnes CO_2E[4]). This is about the same as adding two to four cars to the road (EPA 2015).

In considering the impact of these emissions, it is necessary to also consider offsets from ranching and ranching practices. The per acre emissions from agricultural land is much less than that from urban areas (CARB 2014), so maintaining viable ranches is an important GHG reduction measure where they are located on historic grassland or savanna. GHGs from ranching can be further reduced by best management practices to reduce the generation of GHGs and soil management practices that actively promote carbon sequestration:

- Mello 3/Llano Oaks Dairy intends to use short-term, rotational grazing; this practice means that the cows would eat fairly young grass and then move to the next pasture before bare soil is exposed. As a result, the quality of the food is maintained, reducing the total methane produced. Well managed rotational grazing also helps retain organics in the soil, reducing total GHG emissions.
- The rancher would improve the separation of wet and dry waste.
    - At the Mello 3/Llano Oaks Dairy, rainwater would not be added to the manure pond, reducing the total amount of nutrient-enriched water requiring disposal. Wastewater would be mixed with reclaimed water and used to irrigate fields to increase grass yields. This would reduce the amounts of ammonia, methane, and nitrous oxide released from the manure ponds.
- The rancher would continue to irrigate with reclaimed and/or wastewater, which allows carbon sequestration to continue, even in dry years.

Methods for quantification of some of these offsets are not well developed. However, preliminary studies of carbon farming show that the proposed ranchland management strategies can increase soil carbon sequestration by 25-70 percent (Ryals and Whendee 2013). Grazed land sequesters 129 grams carbon/ square meter on average (Soussana et al 2010), and improvements in ranch management would likely sequester between 100 and 250 tonnes CO_2E annually.

This analysis uses approximations and does not quantify every source of GHG emissions or reductions; however, in analyzing the major sources of GHGs, it appears that improvements in GHG management on the ranch would offset the increase in herd size, leaving the adoption of the Conditional Waiver and

4 “Carbon dioxide equivalent” or “CO_2E” is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2E signifies the amount of CO_2 that would have the equivalent global warming impact. It allows “bundles” of GHGs to be expressed as a single number; and it allows different bundles of GHGs to be easily compared (in terms of their total global warming impact).

reestablishment of dairy operations with no or very little net impact on GHG emissions. The impact would be less than significant.

VII.b) Conflict with applicable plan, policy or regulation – No Impact

As human-induced climate change caused by the generation of GHGs has become widely recognized as a major threat to human welfare and environmental health, government entities at many levels are taking action to reduce GHG emissions. Plans, policies, or regulations that apply to the location and activities of the dairy conversion project include:

California Air Resources Board Scoping Plan – Under the authority of the California Global Warming Solutions Act of 2006, CARB is required to create and update a Scoping Plan that provides specific measures across many sectors to reduce GHGs and other drivers of climate change. The Board approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The updated Scoping Plan includes measures to reduce methane emissions from both enteric fermentation and manure management. In addition, the Scoping Plan includes measures to increase rangeland as a carbon sink. The ranch in this project would be in compliance with the Scoping Plan.

BAAQMD Climate Action Plan - As described in the Air Quality section above, BAAQMD has adopted a CAP that includes measures for GHG reductions. The ranches in this project would be in compliance with the BAAQMD CAP.

The State of California has enacted other plans for GHG reduction, but most are related to land use and transportation; none have bearing on this project. Sonoma County Regional Climate Protection Authority and County of Sonoma General Services Department published a climate protection action plan in 2006, but the plan did not include measures relevant to the current project. Therefore, the project would be in compliance with all relevant plans.

VIII. HAZARDS AND HAZARDOUS MATERIALS Would the Project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less-Than-Significant Impact**	**No Impact**
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?				X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

Discussion:

VIII. a, b) Hazardous materials and accident conditions – Less than Significant

Ranching requires similar hazardous materials to normal household use: vehicles need gasoline, oil, and other operational fluids; operations require household toxics such as chlorine, and acetone. In addition, farming often uses and creates ammonia, nitrates, and methane from animal wastes. Ranching can use some chemicals in larger quantities that are directly part of taking care of the animals. Use and generation of these compounds is the baseline condition of the project, as ranching is ongoing on the property. Standard measures such as wearing appropriate personal protective gear for employees when applying chemicals and specialized containers for shipping are in place and required by law.

The reestablishment of dairy operations may slightly increase the amount of some chemicals used; however, the conditions would not change in ways that could make accidents in storing and delivery of materials more likely. Possible air and water contamination from increased wastes are separately assessed in the air quality, GHG, and hydrology sections; however, the actual potential for human exposure to toxic chemicals is not large and would not change; therefore, adoption of the Conditional Waiver and reestablishment of dairy operations would have a less-than-significant impact on hazardous materials accidental discharge potential.

VIII. c) Emit hazardous emissions within 0.25 mile of a school – No Impact

The ranch is not located within 0.25 miles of a school. There would be no impact from the release of hazardous emissions near a school.

VIII. d) Included on a list of hazardous materials sites – No Impact

The ranch is not included on the Cortese List maintained by the California Department of Toxic Substances or the EnviroStor List maintained by the USEPA. These lists compile multiple sources of toxics identification to comprehensively screen for toxic sites. The ranch is not a known toxic site and would have no impact on toxic sites.

VIII. e, f) Safety hazard for people residing or working within two miles of an airport – No Impact

The project is not within two miles of an airport and would create no airport related safety hazards.

VIII. g) Impair or interfere with an adopted emergency response/evacuation plan – No Impact

The project would happen entirely on an established ranch using existing roads and buildings; there would be no mechanism by which it could interfere with emergency response or prevent any evacuation.

VIII. h) Exposure to wildland fires – Less Than Significant

Adoption of the Conditional Waiver related to the reestablishment of dairy operations would not increase the risk of wildfires in the area. The ranch currently uses electrified fencing for pasture management, which could be a cause of man-caused wildland fires; however, no fires have started from the use of electrified fencing, and none are expected in the future. Exposure to wildfire would remain less than significant.

IX. HYDROLOGY Would the Project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less-Than-Significant Impact**	**No Impact**
a. Violate any water quality standards or waste discharge requirements?		X		
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off- site?			X	
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?			X	
e. 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	
f. Otherwise substantially degrade water quality?		X		
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j. Inundation by seiche, tsunami, or mudflow?				X

Discussion:

IX. a & f) Violate water quality standards or degrade water quality – Less than Significant

The project consists of adoption of a Conditional Waiver under the Regional Water Board's Dairy Program. The purpose is to implement the Water Code and State and federal policy and regulations and to achieve protection of the beneficial uses of water and water quality objectives established in the Basin Plan. The Conditional Waiver includes enforceable conditions or requirements that ensure implementation of management measures and monitoring requirements necessary to protect the beneficial uses of water identified in the Basin Plan, which contains the water quality objectives, prohibitions, and policies needed to protect the beneficial uses.

The ranch is located in the Laguna de Santa Rosa watershed near Colgan Creek and the mainstem of the Laguna. The Laguna de Santa Rosa is a major tributary of the Russian River and drains a 254-square mile watershed in Sonoma County. Major tributaries to the Laguna de Santa Rosa include Windsor Creek, Mark West Creek, Santa Rosa Creek, Blucher Creek, and Copeland Creek. The Laguna is included on the current Clean Water Act Section 303(d) List of Impaired Waters for several pollutants/stressors, including nitrogen, phosphorus, dissolved oxygen, mercury, temperature, and sediment. Protection of the Laguna de Santa Rosa's water quality and beneficial uses is of paramount concern in the area.

The existing and potential beneficial uses of waters in the Laguna de Santa Rosa watershed include:

a. Municipal and Domestic Supply (MUN)
b. Agricultural Supply (AGR)
c. Industrial Service Supply (IND)
d. Industrial Process Supply (PRO)
e. Groundwater Recharge (GWR)
f. Freshwater Replenishment (FRSH)
g. Navigation (NAV)
h. Hydropower Generation (POW)
i. Water Contact Recreation (REC-1)
j. Non-Contact Water Recreation (REC-2)
k. Commercial and Sport Fishing (COMM)
l. Cold Freshwater Habitat (COLD)
m. Warm Freshwater Habitat (WARM)
n. Wildlife Habitat (WILD)
o. Preservation of Areas of Special Rare, Threatened, or Endangered Species (RARE)
p. Migration of Aquatic Organisms (MIGR)
q. Spawning, Reproduction, and/or Early Development (SPWN)
r. Shellfish Harvesting (SHELL)
s. Aquaculture (AQUA)
t. Native American Culture (CUL)
u. Flood Peak Attenuation/Flood Water Storage (FLD)
v. Wetland Habitat (WET)
w. Water Quality Enhancement (WQE)

The Conditional Waiver includes specific and general requirements to implement management practices to ensure that discharges, or potential discharges, from dairy operations meet water quality standards. Potential impacts to water quality from dairy operations would primarily come from nutrients and wastes, including sediment.

To monitor water quality protection, the Conditional Waiver requires completion of a Water Quality Plan and a Nutrient Management Plan specifically for the dairy, as well as development of a monitoring plan to track successful implementation of the elements in all of these plans. Water quality protection measures include waste containment and nutrient application rates consistent with agronomic rates to prevent nutrient runoff. Manure ponds must be sized to hold normal rainfall on the pond and wash water from milking facilities to accommodate a 25-year, 24-hour storm event to avoid overflows and runoff to Colgan

Creek, and the Laguna de Santa Rosa. Rainwater from dairy buildings and facilities must be discharged away from manure ponds through the use of gutters and other infrastructure.

Berms and other treatments must be maintained to prevent manure runoff that could affect groundwater and surface water quality. Manure must not be spread near watercourses, gullies, or swales where sediment and nutrients could enter surface water or groundwater.

Riparian areas must be maintained or fenced to exclude cattle to protect water quality. Low water crossings and/or bridges must be kept clean of manure and sediment to prevent discharges to the watercourse. Cattle would be housed and fed in the barns during wet winter months, which would avoid water quality impacts during wet weather.

The Conditional Waiver includes the measures necessary to prevent sediment and nutrient discharges, protect riparian vegetation, control the facility's waste, and protect water quality and beneficial uses. Additionally, the monitoring and reporting requirements and the need to implement corrective measures means that the dairy would comply with the water quality standards for the Laguna de Santa Rosa and its tributaries. The Regional Water Board has the regulatory authority to require additional mitigation should water quality impacts occur. Therefore, any impacts would be less than significant with implementation of mitigation measures included in the Conditional Waiver.

IX. b) Substantially deplete groundwater supplies or interfere with groundwater recharge – No Impact

The adoption of Conditional Waiver related to the reestablishment of dairy operations would not deplete groundwater supplies or interfere with groundwater recharge. The property has existing wells that currently supply water for ranching operations and domestic use, and the wells would continue to be used for dairy operations. Although pumping would increase to supply adequate water for the milking cows, well water supplies are sufficient to provide the needed water for dairy operations without depleting water supplies (CRA 2015; Erickson 2013). The pastures are irrigated with recycled water from the City of Santa Rosa's Subregional System or from water stored in the manure ponds, and the same irrigation practices would continue with the reestablishment of dairy operations. No new wells are proposed.

No new impervious surfaces would be created with the adoption of the Conditional Waiver or from reestablishment of dairy operations as any repairs would occur on existing buildings or resurfacing would be done on previously compacted areas. The amount of impervious surface would not increase, and the groundwater recharge potential would not change.

IX. c & d) Substantially alter drainage patterns resulting in erosion, siltation, or flooding – Less than Significant

Dairy operations authorized and conducted under the Conditional Waiver would not substantially alter the existing drainage pattern of the pastures or dairy facilities. The dairy would be operated to avoid overgrazing through implementation of a rotational grazing management strategy to provide optimal forage opportunities for cattle and to protect the pasture from compaction and potential erosion and sedimentation. The continued use of rotational grazing would not substantially alter drainage patterns. The impacts would be less than significant following the adoption of the Conditional Waiver related to the reestablishment of dairy operations.

IX. e) Exceed storm water drainage systems or contribute polluted runoff – Less than Significant

Adoption of the Conditional Waiver and the subsequent reestablishment of dairy operations require that the existing manure ponds be sized to contain rainfall on the pond and normal wash water used in milk

production area during a 25-year, 24-hour storm event. The rancher developed a Comprehensive Nutrient Management Plan (CNMP) for dairy operations (CRA 2015). The plan illustrates that existing ponds are sized to accommodate the flows anticipated during 25-year, 24-hour storm event. In addition, rain gutters would be added to existing buildings on the property to minimize stormwater additions to the existing pond. No new or expanded wastewater facilities would be required, and the installation of gutters on the barns and facilities to divert clean roof water away from the pond are the only proposed additions to the stormwater system. The impacts to the existing drainage systems would be less than significant.

IX. g, h, i, & j) Place housing or structures within a 100-year flood zone or result in flooding or inundation – No Impact

Adoption of Conditional Waiver and reestablishment of dairy operations would not include placement of housing, and no new structures would be constructed within the 100-year floodplain. The production area and manure pond are both located above the 100-year floodplain. Flooding occurs on portions of the ranch when flows in the Laguna de Santa Rosa and Colgan Creek rise. Cattle would not be grazed during periods of flooding. Dairy operations would not create flooding or impede flood flows because any new construction would occur on existing foundations, and no new construction would occur within the 100-year flood zone; see Appendix B, Flood Hazard Maps. No new flooding impacts would occur.

X. LAND USE AND PLANNING Would the Project:	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Physically divide an established community?				X
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Discussion:

X. a) Physically divide an established community – No Impact

The project does not include changes in the physical structure of the community, so it would have no impact that would divide a community.

X. b) Conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect – No Impact

The Sonoma County General Plan 2020 designates the project area for agriculture. The existing ranch, whether raising cattle or producing milk, is fully consistent with the zoning, both strict interpretation of the ordinance, and the spirit of the General Plan. There is no conflict and, therefore, no impact.

X. c) Conflicts with any applicable habitat conservation plan or natural community conservation plan – No Impact

The ranch is located in the Santa Rosa Plain Conservation Strategy area. Establishment of dairy operations, would be consistent with allowable management for lands addressed in the Strategy. There are no other habitat conservation plans or natural community conservation plans that cover the ranch. There would be no impact.

XI. MINERAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Discussion:

XI. a & b) Loss of Availability of a Known or Delineated Mineral Resources – No Impact

The adoption of the Conditional Waiver would not authorize mining activities or other activities that could affect mineral resources, and the property is not located within a mineral extraction area. Therefore, the project would not result in loss of availability of mineral resources.

XII. NOISE Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			X	
c. A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?			X	
d. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?			X	
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?				X
f. For a project within the vicinity of a private airstrip, would the Project expose people residing or working in the project area to excessive noise levels?				X

Discussion:

XII. a, b, c, & d) Exposure to noise and vibration levels in excess of standards or a substantial temporary or permanent increase in ambient noise levels – Less than Significant

Adoption of the Conditional Waiver related to the conversion back to dairy operations on the Mello 3/Llano Oaks Dairy would create a minimal noise increase compared to current ranch operations. Dairy operations would require use of the same equipment types and frequency as the current ranching operations, except for equipment used to milk cows. The milking equipment would not produce high noise levels, and milking would occur in the fully enclosed milking barns. Current ranching operations do not create noise or vibration in excess of Sonoma County standards; therefore, no temporary or permanent changes in noise levels are anticipated. The noise impact would be less than significant.

Construction activities at the property (roofing at Mello 3/Llano Oaks Dairy) could temporarily increase noise and could create some vibration around the construction area. Proposed construction activities and the typical equipment used in roofing and building construction would not produce noise or vibration in excess of County standards, and the increase would be temporary during construction activities only. Construction would not occur at night. The temporary increase in noise during construction would be less than significant.

XII. e & f) Exposure of people residing or working near an airport or private airstrip to excessive noise levels – No Impact

The Mello 3/Llano Oaks Dairy property is not located near an airport or landing strip; therefore, no impact from noise would occur with the proposed project.

XIII. POPULATION AND HOUSING Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Discussion:

XIII. a) Induce substantial population growth – No Impact

The project includes adoption of a Conditional Waiver and reestablishment of dairy operations. It does not include new homes or businesses, only a change in product from the existing ranch. It does not add any infrastructure to enable growth, and it would not influence growth. There would be no impact.

XIII. b & c) Displace substantial numbers of existing housing or people – No Impact

The ranch housing that currently exists on the property would continue to be used. No housing or people would be displaced by the project, so there would be no impact.

XIV. PUBLIC SERVICES Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?				X
b. Police protection?				X
c. Schools?				X
d. Parks?				X
e. Other public facilities?				X

Discussion:

XIV. a, b, c, d, & e) Impacts associated with new or altered fire or police protection, schools, parks, or other facilities – No Impact

The adoption of the Conditional Waiver would not change the physical set up of the ranch in a way that could alter emergency access or add activities that would require additional emergency services. The project would, therefore, have no impact on any emergency services.

XV. RECREATION Would the Project:	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b. Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				X

Discussion:

XV. a & b) Increase in the use of existing facilities resulting in substantial physical deterioration or require construction or expansion of recreational facilities – No Impact

The adoption of the Conditional Waiver and the reestablishment of dairy operations would not include recreational facilities or the use of existing recreational facilities in any way. There are no parks or other recreational facilities near the project, except a public education trail at the Laguna de Santa Rosa Wastewater Treatment Plant. It is unlikely that any change in normal ranch operations resulting from the project would be noticeable from the trail, and there would be no mechanism by which ranch operations could affect it. The project would have no impact on recreation.

XVI. TRANSPORTATION / TRAFFIC Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e. Result in inadequate emergency access?				X
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

Discussion:

XVI. a & b) Conflict with applicable plans, ordinances, or policies relating to the effectiveness of the circulation system or an applicable congestion management plan – Less than Significant

Facilities at the Mello 3/Llano Oaks Dairy are in-place and ready to change from ranching to dairy operations after adoption of the Waiver, except for installation of a new roof on the barn. Installation of a new roof would require construction work for several days. Construction would only temporarily increase the number of vehicles per day to the site. Once installation is completed and dairy operations begin, the number of vehicle trips per day would increase by approximately one vehicle: a truck would pick up milk once per day, and the additional truck trip would not conflict with any circulation or congestion management plan. The impact would be less than significant.

XVI. c) Result in a change in air traffic patterns – No Impact

The project would not use or affect air traffic. There is no change in land use that could require a change in air traffic patterns. There is no mechanism by which the project could change air traffic patterns, so there would be no impact on air traffic.

XVI. d, e, & f) Substantially increase hazards due to a design feature, result in inadequate emergency access, or conflict with adopted plans for public transit, bicycle, or pedestrian facilities – No Impact

The adoption of the Conditional Waiver would not require changes in any roads. As explained above, the total additional traffic would be too small to make any noticeable difference in emergency access or access/feeling for a user of any type of transportation, including public transit, bicycles, and pedestrians.

XVII. UTILITIES AND SERVICE SYSTEMS Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Board?				X
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d. Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e. Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?				X
f. Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?				X
g. Comply with federal, state, and local statutes and regulations related to solid waste?				X

Discussion:

XVII. a, b, c, d, & e) Exceed wastewater treatment requirements, require construction or expansion of new water, wastewater, or stormwater treatment facilities – No Impact

Adoption of the Conditional Waiver and the subsequent dairy operations require that the existing manure pond be sized to contain rainfall on the pond and normal wash water used in milk production area during a 25-year, 24-hour storm event. The ranch developed a Comprehensive Nutrient Management Plan (CNMP) for dairy operations (CRA 2015). The plan illustrates that the current sizing of the ponds on the ranch is sufficient to accommodate the anticipated runoff into the wastewater pond. Additionally, rain gutters would be added to existing buildings at the Mello 3/Llano Oaks Dairy to minimize stormwater additions to the existing pond. No new or expanded wastewater facilities would be required, and the installation of gutters on the barns and facilities to divert clean roof water away from the pond are the only proposed additions to the stormwater system.

Existing water supplies on the ranch is adequate to serve the reestablished dairy operations and to supply the additional needs in the milking parlor. The Mello 3/Llano Oaks Dairy would continue to irrigate

pastures with water pumped from the existing ponds and augmented with recycled water when necessary. No new water supplies would be required.

XVII. f & g) Have sufficient landfill capacity and comply with statutes related to solid waste – No Impact

The dairy would continue to be served by its existing waste disposal service provider for disposal of solid waste (except manure). Ranch operations currently comply with statutes related to solid waste, and the reestablished dairy operations would not significantly change the amount of solid waste produced or change the way solid waste is handled. Therefore, there would be no impact.

4. Mandatory Findings of Significance

Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b. Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			X	
c. Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			X	

Discussion

4. a) Degrade the quality of the environment - Less than Significant with Mitigation

Based on the analysis contained in this Initial Study all impacts associated with the issuance of the Conditional Waiver would either have no impact, less than significant impacts, or less than significant impacts following implementation of mitigation measures. With implementation of the mitigation measures, the project does not have the potential to degrade the quality of the environment, including fish or wildlife species or their habitat or plant and animal communities.

4. b) Degrade the quality of the environment as a result of cumulative impacts- Less than Significant

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines §15355). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

A cumulative impact is the effect on the environment, which results from the incremental impact of the proposed project when combined with the effects of other past, present, and reasonably foreseeable future projects. The significance of a cumulative impact may be greater than the significance of individual effects resulting from the individual actions.

As described in the evaluation of impacts for all resources in Section 3, dairy operations covered under the Conditional Waiver could result in degraded water quality from increased erosion, or from discharge of

sediment and nutrients to surface or groundwater. The projects' potential contribution to any cumulative water quality impact would not be cumulatively considerable (less than significant). All other project impacts were either No Impact or Less than Significant.

In addition, there would be no cumulative impact from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. There are other dairies operations proposed or already operating near the Mello property. However, these dairies are regulated through waste discharge requirements (or waiver of waste discharge requirements) which are designed to reduce the impact of erosion on water quality, and to reduce the impact of sediment and nutrient discharges. The incremental impact of the project would not lead to a cumulative impact.

4. c) Degrade the quality of the environment for humans- Less than Significant

As described in the evaluation of impacts for all resources in Section 3, adoption of the Conditional Waiver would not degrade the environment for humans. With implementation of mitigation measures the project does not have the potential to degrade, important examples of the major periods of California history or prehistory or cause adverse effects on human beings. The impacts related to traffic, noise, air quality, public services, utilities and service systems, and aesthetics were all identified as No Impact or Less than Significant.

5. Preparers

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Water Resource Control Engineer
North Coast Regional Water Quality Control Board

The following Prunuske Chatham, Inc. team members assisted in preparation of this Initial Study/Proposed MND:

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Appendix A - Biological Resources

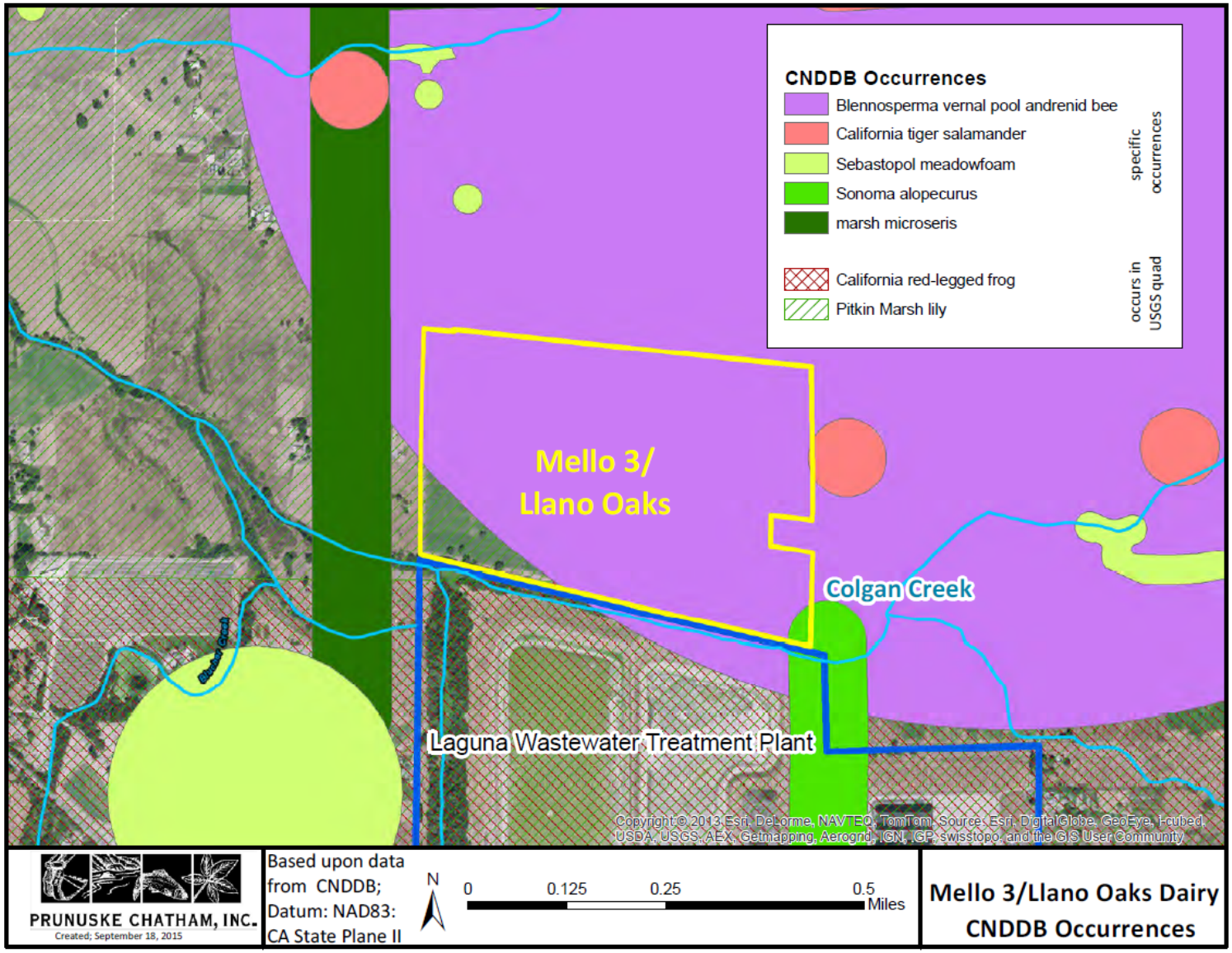


TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
Invertebrates				
Blennosperma vernal pool andrenid bee *Andrena blennospermatis*	-/-	S2/-	Oligolectic on vernal pool Blennosperma, bees nest in the uplands around vernal pools.	Unlikely to occur, habitat present on adjacent parcels.
California freshwater shrimp *Syncaris pacifica*	E/E	S1/-	Endemic to Marin, Napa, and Sonoma counties. Found in low elevational, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main streamflow. Need undercut banks with exposed roots for winter habitat. Require leafy branches touching the water for summer habitat.	Unlikely - Habitat present in channels northwest of the Mello property, but no habitat on the property.
Amphibian				
California tiger salamander *Ambystoma californiense*	T/T	-/-	Central Valley DPS federally listed as threatened, Santa Barbara & Sonoma Counties DPS federally listed as endangered.	Likely to occur– Mello 3/Llano Oaks Dairy Adult occurrences reported on the east side of Llano Road, east

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
			Need underground refuges, especially ground squirrel burrows, vernal pools or other seasonal water sources for breeding.	of Mello, and at the Walker Avenue Mitigation Bank, east of the Mello. None documented on the west side of the Laguna. May utilize the Mello property as upland and migration habitat.
Reptiles				
western pond turtle *Emys marmorata*	FSC/CSC	S3/-	Still waters, ponds, slow streams with instream or bank resting sites. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg laying.	Unlikely to occur within dairy, could occur within adjacent riparian areas
Birds				
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	T/E	S1/-	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nest in riparian jungles of willow, often mixed with cottonwoods, lower story of blackberry, nettles, or wild grape.	Unlikely to occur within dairy, could occur within adjacent riparian areas
Mammals				

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
American badger *Taxidea taxus*	-/-	S3	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils and open uncultivated ground, preys on burrowing rodents, digs burrows.	Unlikely to occur, ground cultivated
Plants				
Sonoma alopecurus *Alopecurus aequalis var. sonomensis*	E/-	S1/1B	Freshwater marshes and swamps, riparian scrub. Wet areas, marshes, riparian banks with other wetland species. 5-360 m.	Unlikely to occur, may be present in riparian areas adjacent to the dairies
fragrant fritillary *Fritillaria liliacea*	-/-	S2/1B	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine, various soils reported though usually clay, in grassland. 3-410m.	Not likely to occur
Sonoma sunshine *Blennosperma bakeri*	E/E	S1/1B	Vernal pools, valley and foothill grassland. 10-110 m.	Vernal pools and wetland habitats on the property are unlikely to support populations of listed plants given the current condition and historical land uses.

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
Sonoma spineflower *Chorizanthe valida*	E/E	S1/1B	Coastal prairie, sandy soils.	Not likely to occur
dwarf downingia *Downingia pusilla*	-/-	S2/2	Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. Found in several types of vernal pools.	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
congested-headed hayfield tarplant *Hemizonia congesta ssp. congesta*	-/-	S1S2/1B	Valley and foothill grassland. Grassy valleys and hills. Often I fallow fields and sometimes along roadsides. 20-560 M	Not likely to occur
thin-lobed horkelia Horkelia tenuiloba	-/-	S2/1B	Broadleaved upland forest, chaparral, valley and foothill grassland. Sandy soils, mesic openings. 50-500 M.	Not likely to occur

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
Burke's goldfields *Lasthenia burkei*	E/E	S1/1B	Vernal pools, meadows, and seeps. Most often in vernal pools and swales. 15-600 M.	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
Baker's goldfields *Lasthenia californica ssp. bakeri*	-/-	SH/1B.2	Closed –cone coniferous forest, coastal scrub meadows and seeps, marshes and swamps. Openings. 60-520 M.	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
Legenere *Legenere limosa*	-/-	S2/1B.1	Beds of vernal pools. 1-880 M.	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
Sebastopol meadowfoam *Limnanthes vinculans*	E/E	S1/1BG.1	Mesic meadows, vernal pools, valley and foothill grassland. Swales, wet meadows and marshy areas in valley oak savanna on poorly drained soils of clays and sandy loam. 15-305 M.	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
marsh microseris	-/-	S2/1B	Closed-cone coniferous forest, cismontane woodland, coastal	Unlikely to occur

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
Microseris paludosa			scrub valley and foothill grasslands	
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	-/-	S2/1B	Cismontane woodland, meadows, seeps, vernal pools, valley and foothill grassland	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition and historical land uses.
Cunningham Marsh cinquefoil *Potentilla uliginosa*	-/-	SH/1A	Freshwater marshes and swamps	Unlikely to occur
California beaked-rush *Rhynchospora californica*	-/-	S1/1B	Bogs and fens, marshes and swamps, lower montane coniferous forests, meadows and seeps.	Unlikely to occur
showy rancheria clover *Trifolium amoenum*	E/-	S1/1B	Valley and foothill grasslands, coastal bluff scrub. Sometimes on serpentine soils, open sunny sites, most recently cited on roadside and eroding cliff face.	Unlikely to occur
saline clover *Trifolium hydrophilum*	-/-	S2/1B.2	Marshes and swamps, valley and foothill grassland, vernal pools, alkaline sites	Vernal pools and wetland habitats on the property are unlikely support populations of listed plants given the current condition

TABLE A-1: SPECIAL-STATUS PLANT AND ANIMAL SPECIES CONSIDERED IN THE PROJECT STUDY ARE

Common Name **Scientific Name**	**Status** **Fed/State**	**State Rank** **CA Rare Plant Rank**	**Habitat**	**Potential to Occur**
				and historical land uses.
oval-leaved viburnum *Viburnum ellipticum*	-/-	S3/2B.3	Chaparral, cismontane woodland, lower montane coniferous forest	Unlikely to occur

Notes

U.S. Fish and Wildlife Service (FWS) Federal Listing Categories:

- E Federal Endangered
- T Federal Threatened
- C Federal Candidate Species
- FSC Federal Species of Concern

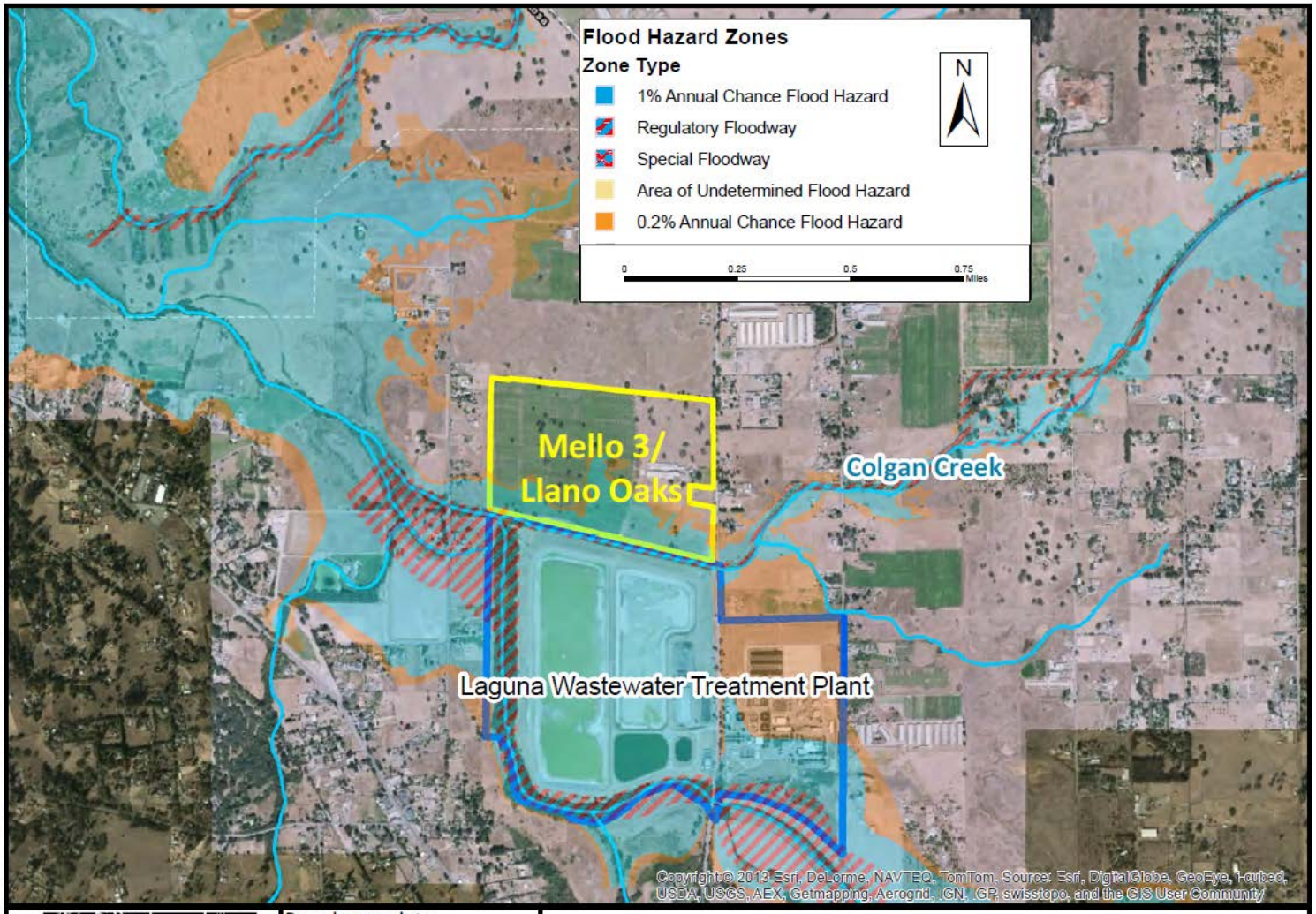
California Department of Fish and Game (CDFG) State Listing Categories:

- E California Endangered
- T California Threatened
- CSC California Species of Concern

California Native Plant Society (CNPS) Categories:

- 1B Plant rare or endangered in California and elsewhere
- 2 Plant rare or endangered in California, but more common elsewhere

Appendix B – FEMA Flood Hazards



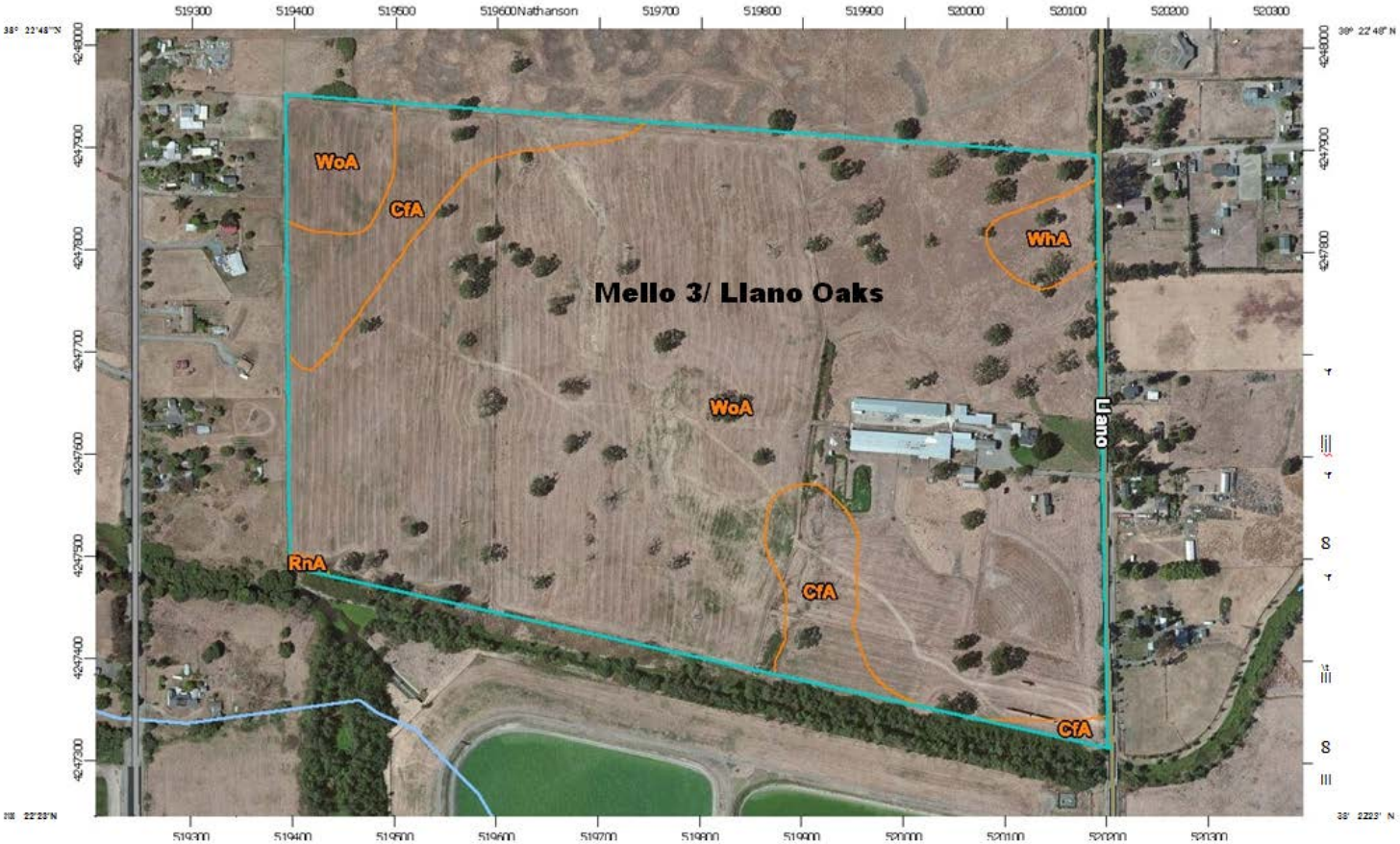
PRUNUSKE CHATHAM, INC.
Created; September 22, 2015

Based upon data from FEMA & ESRI; Datum: WGS 1984 Mercator Auxillary Sphere

Mello 3/Llano Oaks Dairy
FEMA Flood Insurance Rate Map Boundaries

Appendix C – Soil Maps

Soil Map-Sonoma County, California
(Mello Farms Dairy II)



Map Scale: 1:5,420 if printed on A landscape (11" x 8.5") sheet.

N

A

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Soil Map
Sonoma County

USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

3/3/2015
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 8, Sep 25, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 14, 2011—Aug 15, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Sonoma County, California (CA097)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BhB	Blucher loam, 2 to 5 percent slopes	1.7	0.1%
CfA	Clear Lake clay, ponded, 0 to 2 percent slopes	59.0	4.5%
CtC	Cotati fine sandy loam, 2 to 9 percent slopes	183.7	14.1%
CtD	Cotati fine sandy loam, 9 to 15 percent slopes	62.9	4.8%
CtE	Cotati fine sandy loam, 15 to 30 percent slopes	35.3	2.7%
GdC	Goldridge fine sandy loam, 2 to 9 percent slopes	30.1	2.3%
HaB	Haire fine sandy loam, hummocky, 0 to 5 percent slopes	2.7	0.2%
M-W	Miscellaneous water	75.7	5.8%
RnA	Riverwash	7.9	0.6%
W	Water	2.7	0.2%
WhA	Wright loam, wet, 0 to 2 percent slopes	280.7	21.5%
WoA	Wright loam, shallow, wet, 0 to 2 percent slopes	561.7	43.1%
Totals for Area of Interest		**1,304.1**	**100.0%**

Map Unit Legend

Sonoma County, California (CA097)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CfA	Clear Lake clay, ponded, 0 to 2 percent slopes	10.3	10.0%
RnA	Riverwash	0.1	0.1%
WhA	Wright loam, wet, 0 to 2 percent slopes	1.9	1.9%
WoA	Wright loam, shallow, wet, 0 to 2 percent slopes	90.7	88.0%
Totals for Area of Interest		**103.1**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Sonoma County, California

CfA—Clear Lake clay, ponded, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hfbm
Elevation: 1,500 feet
Mean annual precipitation: 10 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 245 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Clear lake and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 13 inches: clay
H2 - 13 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Minor Components

Huichica

Percent of map unit: 6 percent

Whight

Percent of map unit: 6 percent

Zamora

Percent of map unit: 3 percent

RnA—Riverwash

Map Unit Setting

National map unit symbol: hfj7
Elevation: 700 to 2,900 feet
Mean annual precipitation: 8 to 15 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Riverwash: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Flood plains
Parent material: Sandy and gravelly alluvium

Typical profile

H1 - 0 to 6 inches: very gravelly sand
H2 - 6 to 60 inches: stratified very gravelly coarse sand to very gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Unnamed

Percent of map unit: 15 percent

WhA—Wright loam, wet, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hfkm
Elevation: 60 to 300 feet
Mean annual precipitation: 30 inches

Mean annual air temperature: 55 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wright and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wright

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 2 to 7 inches: loam
H2 - 7 to 25 inches: loam
H3 - 25 to 62 inches: clay
H4 - 62 to 73 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D

Minor Components

Unnamed

Percent of map unit: 5 percent
Landform: Flood plains

Huichica

Percent of map unit: 3 percent

Yolo

Percent of map unit: 3 percent

Zamora

Percent of map unit: 3 percent

Clear lake

Percent of map unit: 1 percent
Landform: Flood plains

WoA—Wright loam, shallow, wet, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hfkp
Elevation: 60 to 300 feet
Mean annual precipitation: 30 inches
Mean annual air temperature: 55 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Wright and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wright

Setting

Landform: Hills, terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Convex, linear
Parent material: Alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 15 inches: loam
H3 - 15 to 62 inches: clay
H4 - 62 to 73 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D

Minor Components

Huichica
Percent of map unit: 5 percent

Yolo
Percent of map unit: 5 percent

Clear lake
Percent of map unit: 3 percent
Landform: Depressions

Unnamed
Percent of map unit: 2 percent
Landform: Depressions

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 8, Sep 25, 2014

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. Particle

size is the effective diameter of a soil particle as measured by

sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink- swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than

1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group

1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Physical Soil Properties–Sonoma County, California

Physical Soil Properties–Sonoma County, California														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
CfA—Clear Lake clay, ponded, 0 to 2 percent slopes														
Clear lake	0-13	-22-	-28-	40-50- 60	1.30-1.45	0.42-1.40	0.14-0.16	6.0-8.9	1.0-4.0	.15	.15	5	4	86
	13-60	-22-	-28-	40-50- 60	1.25-1.40	0.42-1.40	0.14-0.16	6.0-8.9	0.5-1.0	.24	.24			
RnA—Riverwash														
Riverwash	0-6	-98-	- 2-	0- 1- 1	1.60-1.70	42.00-141.00	0.02-0.03	0.0-2.9	0.0-0.1	.02	.02		2	134
	6-60	-93-	- 7-	0- 1- 1	1.60-1.70	42.00-141.00	0.02-0.03	0.0-2.9	0.0	.02	.10			
WhA—Wright loam, wet, 0 to 2 percent slopes														
Wright	2-7	-43-	-40-	10-18- 25	1.50-1.55	4.00-14.00	0.14-0.16	0.0-2.9	1.0-4.0	.37	.37	4	5	56
	7-25	-43-	-40-	10-18- 25	1.60-1.70	1.40-4.00	0.14-0.16	0.0-2.9	0.0-0.5	.49	.49			
	25-62	-28-	-29-	35-43- 50	1.60-1.80	0.01-0.42	0.04-0.06	6.0-8.9	0.0-0.5	.28	.28			
	62-73	-55-	-17-	20-28- 35	1.65-1.75	1.40-4.00	0.14-0.16	3.0-5.9	0.0-0.5	.24	.24			

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
WoA—Wright loam, shallow, wet, 0 to 2 percent slopes														
Wright	0-7	-43-	-40-	10-18- 25	1.50-1.55	4.00-14.00	0.14-0.16	0.0-2.9	1.0-4.0	.43	.43	3	5	56
	7-15	-43-	-40-	10-18- 25	1.60-1.70	1.40-4.00	0.14-0.16	0.0-2.9	0.0-0.5	.49	.49			
	15-62	-28-	-29-	35-43- 50	1.60-1.80	0.01-0.42	0.04-0.06	6.0-8.9	0.0-0.5	.28	.28			
	62-73	-55-	-17-	20-28- 35	1.65-1.75	1.40-4.00	0.14-0.16	3.0-5.9	0.0-0.5	.24	.24			

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 8, Sep 25, 2014

Chemical Soil Properties

This table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity and aeration, and a general degradation of soil structure.

Report—Chemical Soil Properties

Chemical Soil Properties–Sonoma County, California								
Map symbol and soil name	**Depth**	**Cation-exchange capacity**	**Effective cation-exchange capacity**	**Soil reaction**	**Calcium carbonate**	**Gypsum**	**Salinity**	**Sodium adsorption ratio**
	In	*meq/100g*	*meq/100g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
CfA—Clear Lake clay, ponded, 0 to 2 percent slopes								
Clear lake	0-13	30-50	—	5.6-7.3	0	0	0	0
	13-60	30-50	—	7.4-8.4	0-5	0	0.0-2.0	0
RnA—Riverwash								
Riverwash	0-6	—	1.0-5.0	—	0	0	0	0
	6-60	—	1.0-5.0	—	0	0	0	0
WhA—Wright loam, wet, 0 to 2 percent slopes								
Wright	2-7	10-15	—	5.1-6.5	0	0	0	0
	7-25	10-15	—	5.1-6.0	0	0	0	0
	25-62	35-45	—	4.5-7.3	0	0	0	0
	62-73	20-30	—	6.1-7.3	0	0	0	0
WoA—Wright loam, shallow, wet, 0 to 2 percent slopes								
Wright	0-7	10-15	—	5.1-6.5	0	0	0	0
	7-15	10-15	—	5.1-6.0	0	0	0	0
	15-62	35-45	—	4.5-7.3	0	0	0	0
	62-73	20-30	—	6.1-7.3	0	0	0	0

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 8, Sep 25, 2014