WASTE MANAGEMENT PLAN

MISSION LIVESTOCK
ORLAND, CALIFORNIA
ORDER No. R5-2017-0058

Prepared for

Mission Livestock

Prepared by

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

APRIL 2020
REVISED APRIL 30, 2020

VESTRA
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GIS, Environmental, & Engineering Services

April 30, 2020

72007

Bryan J. Botsford, PG
Confined Animals Unit
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

RE: Waste Management Plan (Revised 4/30/2020)
Conversion Greenwood Dairy to Mission Livestock Feedlot
Orland, California

Dear Mr. Botsford:

Attached please find the revised Waste Management Plan required under Regional Water Quality Control Board (RWQCB) Order R5-2017-0058. The initial submittal covered the conversion of the former Greenwood Dairy to a feedlot to be managed by Mission Livestock. The facility conversion meets the "Existing Facility" requirements of the Order. Greenwood Dairy was approved for 5,567 Animal Units (AU) and underwent CEQA review in 2007; see Appendix B in the attached report. The current submittal includes the revision to the conversion number requested in your letter dated April 30, 2020.

Please call me with questions regarding this submittal at (530) 223-2585.

Sincerely,

VESTRA Resources, Inc.

Wendy Johnston
Project Manager

Attachments

CC: Doug Freitas/ Mission Livestock
Julia Violich/Violich Farms
Andy Popper/Glenn County Planning Department

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APRIL 2020
REVISED APRIL 30, 2020

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1.0 INTRODUCTION

1.1 Facility Description

Facility Name: Mission Livestock
County: Glenn
Facility Address: 6569 County Road 27 Orland, CA 95963 (see Figure 1)
Parcel Number: Portion of APN 024-100-017-0
Contact Information: Douglas Freitas, Mission Livestock
Mailing Address: P.O. Box 933 Dixon, CA 94914
Phone number: (510) 996-8455

Mission Livestock is applying for coverage under Order R5-2017-0058 *Waste Discharge Requirements General Orders for Confined Bovine Feeding Operations* (General Order). The proposed location is a historical dairy facility that has been operated as a dairy since 2001. The dairy was covered under individual Waste Discharge Requirements (WDR) Order R5-2008-0122 and will cease operation in June 2020. Previous to that, the facility was operated as a feedlot from 1978 to 1995. The facility meets the requirements of the General Order for an "Existing Facility." The dairy completed an expansion in 2008 and the maximum herd size was addressed in a CEQA document approved by Glenn County in 2007. The Notice of Intent to apply for coverage under the General Order is included as Appendix A and the Glenn County resolution adopting the Use Permit and CEQA Mitigated Negative Declaration is included in Appendix B.

The former dairy facility and surrounding property are owned by Paul Violich Revocable Trust; Violich Farms, Inc.; and Alcatraz Farming, Inc. (see Figure 2). Mission Livestock will lease the former dairy facility as outlined on Figure 3. A revised Form 200 covering the change in operation is included in Appendix C.

The expansion permitted in 2007 addressed 5,567 Animal Units (AU) (4,100 Holstein cows and heifers; see Table 1). Previous operators have implemented Best Management Practices (BMPs) while operating the facility. Due to responsible facility oversight, pests and odors were kept to a minimum and structures are in good working condition. The site includes six clay-lined wastewater ponds, three freestall barns, manure separator and drying area, medical barns, exercise pens, stormwater retention pond (non-contact), and numerous feed storage buildings. Site layout is shown on Figure 3. The dairy currently composts manure onsite for use as bedding. The parcel is zoned "Intensive Agriculture" as shown on Figure 4.

Mission Livestock proposes to convert the dairy to a feedlot housing an average of approximately 7,100 head of beef cattle with a maximum of 9,000 head. The cattle would be comprised of mixed breeds. The calves would weigh approximately 350 to 500 pounds when arriving at the feedlot. Cattle would be at the feedlot for approximately 150 days. The weight of the cattle when leaving the feedlot will be approximately 950 pounds. The overall average weight of cattle at the feedlot is estimated to be 675 pounds.

According to the General Order specifications and calculation of AUs, the average 7,100 head of beef cattle is estimated to be approximately 2,485 AU using the 0.35 AU conversion. The 9,000 head would be 3,150 AUs. Both are below the currently permitted operating limit of 5,567 AU.

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FIGURE 1
GENERAL SITE LOCATION
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

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Approximate Parcel Boundary

N

0 750 1,500 3,000 Feet

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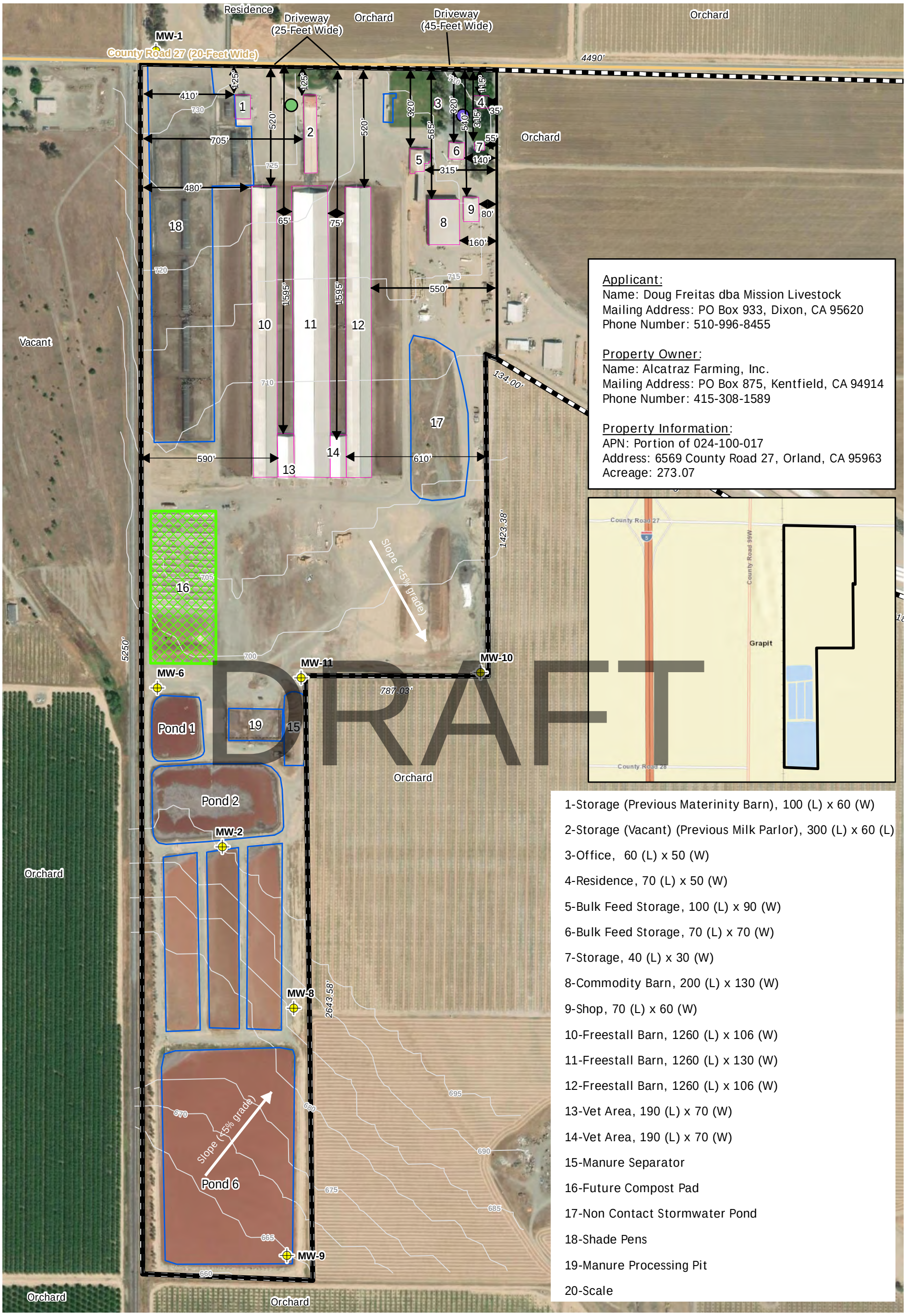
FIGURE 2
OWNERSHIP FORMER
GREENWOOD DAIRY
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

P:\GIS\72007 Mission Livestock\Figures\72007_GreenwoodDairyOwnership.mxd



Applicant:
Name: Doug Freitas dba Mission Livestock
Mailing Address: PO Box 933, Dixon, CA 95620
Phone Number: 510-996-8455

Property Owner:
Name: Alcatraz Farming, Inc.
Mailing Address: PO Box 875, Kentfield, CA 94914
Phone Number: 415-308-1589

Property Information:
APN: Portion of 024-100-017
Address: 6569 County Road 27, Orland, CA 95963
Acreage: 273.07

1-Storage (Previous Materinity Barn), 100 (L) x 60 (W)
2-Storage (Vacant) (Previous Milk Parlor), 300 (L) x 60 (L)
3-Office, 60 (L) x 50 (W)
4-Residence, 70 (L) x 50 (W)
5-Bulk Feed Storage, 100 (L) x 90 (W)
6-Bulk Feed Storage, 70 (L) x 70 (W)
7-Storage, 40 (L) x 30 (W)
8-Commodity Barn, 200 (L) x 130 (W)
9-Shop, 70 (L) x 60 (W)
10-Freestall Barn, 1260 (L) x 106 (W)
11-Freestall Barn, 1260 (L) x 130 (W)
12-Freestall Barn, 1260 (L) x 106 (W)
13-Vet Area, 190 (L) x 70 (W)
14-Vet Area, 190 (L) x 70 (W)
15-Manure Separator
16-Future Compost Pad
17-Non Contact Stormwater Pond
18-Shade Pens
19-Manure Processing Pit
20-Scale

Monitoring Well
Barn Well
Domestic Well
Future Paved Compost Area
Current Lease Boundary
Approximate Parcel Boundary
Buildings
Property Features

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0 200 400 800 Feet
1 inch = 400 feet

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

Prepared by: Jennifer Williams, VESTRA Resources, Inc.
Address: 5300 Aviation Drive, Redding, CA 96002
Phone Number: (530) 223-2585
Date of Preparation: February 28, 2020

FIGURE 3
SITE PLAN, MISSION LIVESTOCK
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

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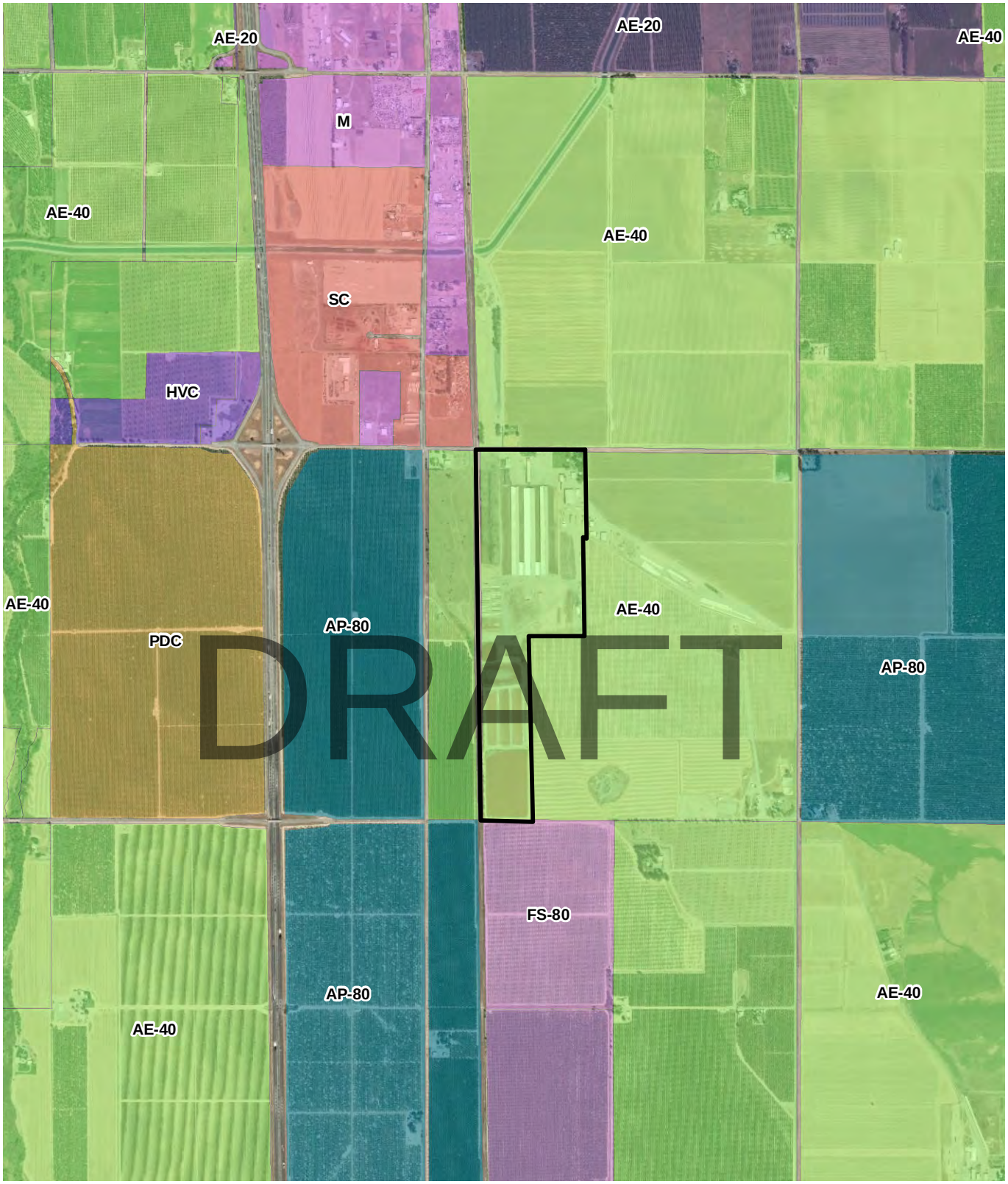

SOURCE: GLENN COUNTY PLANNING DEPARTMENT 2020

FIGURE 4
ZONING
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

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The 5,567 AU expansion underwent CEQA review and was approved by Glenn County in 2007. Previous dairy facility approved operating herd size is shown in Table 1. Greenwood Dairy plans to cease operations and transport all cows offsite by May 2020. Although Mission Livestock does not anticipate housing this cattle volume, this would be the maximum allowed under this Order.

Table 1
PREVIOUS DAIRY FACILITY APPROVED OPERATING HERD SIZE

Milk Cow (Holstein)	Animal Count	Factor	AU
Dry Cow (Holstein)	3,500	1.40	4,900
Heifers 12-24 months	550	1.12	616
Heifers 3-12 months	50	1.02	51
Calves	0	0.49	0
Total	4,100	--	5,567

Manure will continue to be composted onsite. The manure will be combined with almond processing waste from the adjoining orchards, composted onsite, and returned to the adjacent orchards. Water from the ponds may be used to provide moisture to the compost. The composting operation meets the definition of "agricultural composting" under the current Order WQ 2015-0121-DWQ *General Waste Discharge Requirements for Composting Operations* and would be exempt from the requirements of the Order. If required to do so, the facility will limit the production of compost to no more than 25,000 cubic yards processed onsite at any given time to meet the requirements of the pending amendment to the Order dated October 31, 2019 (not yet adopted).

1.2 Location

The facility is located 4 miles south of Orland in Glenn County at 6569 County Road 27, Section 15, Township 21 North, Range 3 West, M.D.B.M. Based on U.S. Geological Survey (USGS) Orland 7.5-minute Quadrangle, the site coordinates are Latitude: 39.674°N, Longitude: 122.190°W. County Road 27 borders the property to the north, Southern Pacific Railroad line and private parcels border the property to the west, and the Fulton Reclamation and Recycling borders the property to the south. Irrigated croplands border the property to the northeast. The site layout of the proposed feedlot was included as Figure 3. The previous land application areas (cropland) have been converted to almonds. No land application of wastewater will occur. The onsite wastewater ponds will be used to collect and retain onsite stormwater from areas that contact manure. Roof runoff and other "non-contact" water is directed to a separate stormwater detention pond.

1.3 Zoning

The property being leased by Mission Livestock is zoned *Intensive Agriculture, 40-acre minimum,* as shown on Figure 4.

2.0 SITE INFORMATION

2.1 Precipitation

The Orland weather station (No. 046506) averages approximately 20 inches of precipitation per year with a period of record 1903-2019. Most precipitation falls during the winter months, with 81 percent of the annual total received between November and March. Summer thundershowers account for less than 1 percent of the annual precipitation. Average annual precipitation is summarized in Table 2 and on Figure 5.

2.2 Evaporation

Pan evaporation for the Chico Experiment Station (1906-2005) and evapotranspiration (ETo) data for the Durham CIMIS Station are summarized in Table 2 and shown on Figure 6.

Table 2
PRECIPITATION, PAN EVAPORATION, AND EVAPOTRANSPIRATION

Month	Average Precipitation[1]	Average Precipitation x 1.5	Pan Evaporation[2]	ETo[3]
10	1.05	1.58	4.46	3.33
11	2.32	3.48	2.09	1.63
12	3.52	5.28	1.30	1.05
1	4.04	6.06	1.26	1.21
2	3.43	5.15	2.13	1.95
3	2.66	3.99	3.82	3.40
4	1.30	1.95	5.63	4.89
5	0.73	1.10	8.28	6.58
6	0.37	0.56	10.11	7.35
7	0.04	0.06	11.48	7.54
8	0.11	0.17	9.71	6.61
9	0.37	0.56	7.36	4.92
Total	**19.94**	**29.91**	**67.63**	**50.46**

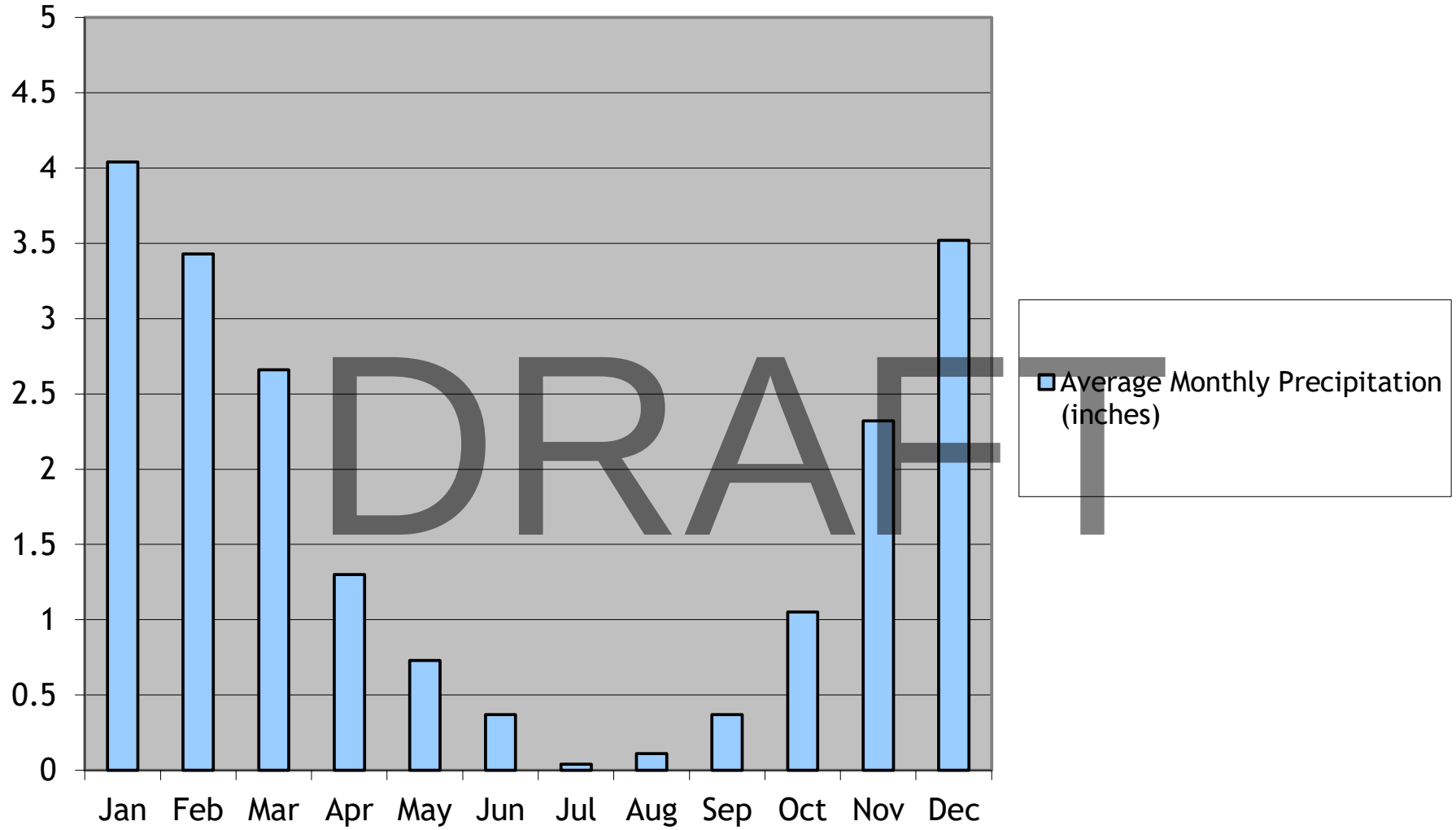
Notes:
1 Orland, California (046506), 1903-2016, WRCC 2020
2 Chico Experiment Station, 1906-2005, WRCC 2020
3 Durham CIMIS Station 12, CIMIS 2020

2.3 25-Year/24-Hour Storm

The 25-year, 24-hour storm for the site (NOAA Atlas 14, Volume 6, version 2, Orland Station No. 046506) is 3.89 inches.

2.4 Flood Protection

The feedlot is not located near any streams and is outside of any 100-year flood hazard zones. The site is located in an area of minimal flooding, Zone X. Flood potentials are derived from the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency



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SOURCE: WESTERN REGIONAL CLIMATE CENTER, ORLAND STATION 046506

FIGURE 5
AVERAGE MONTHLY PRECIPITATION
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

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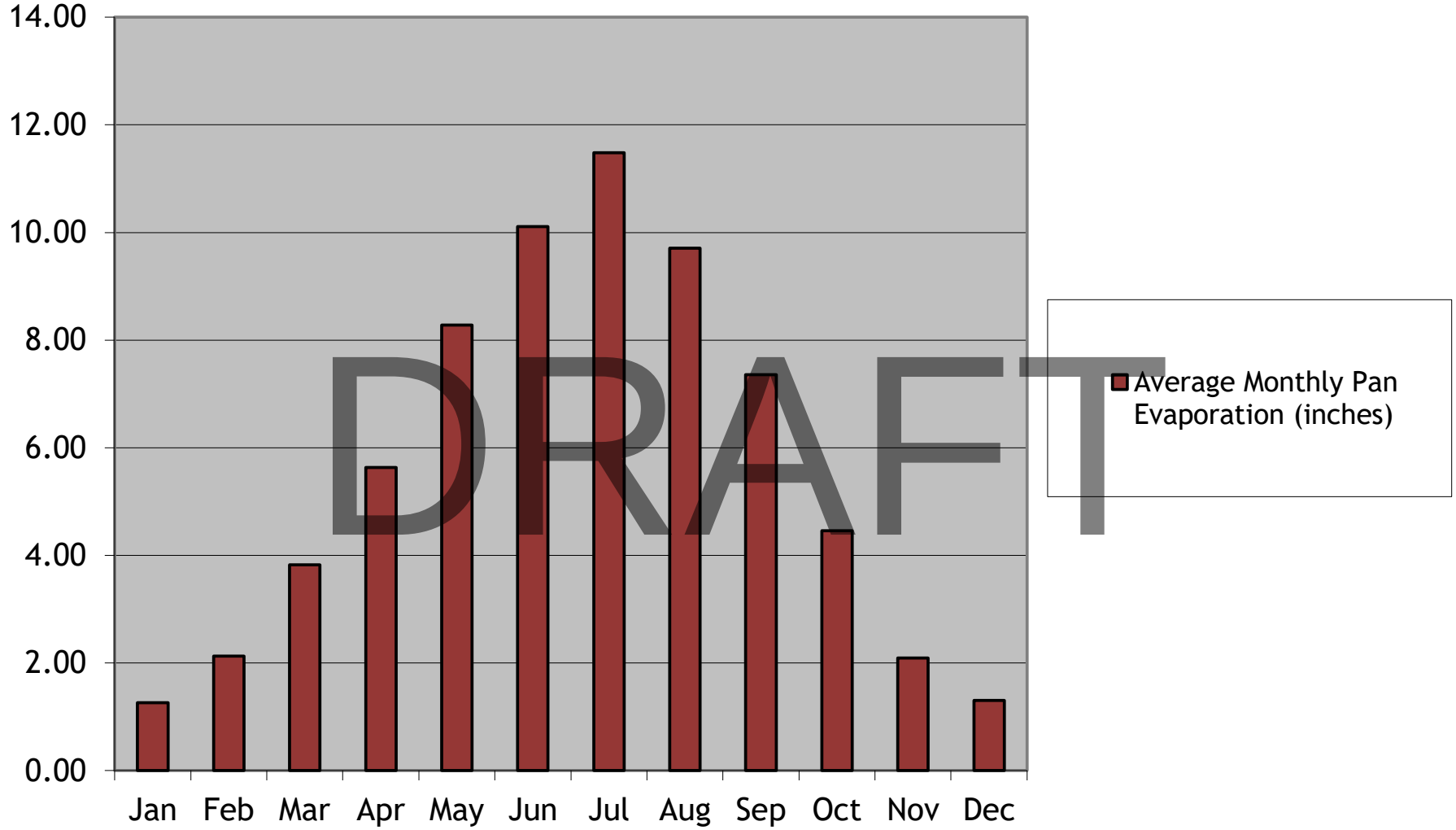

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SOURCE: NCDC COOP STATION 041715 (CHICO EXPERIMENT STATION)

FIGURE 6
AVERAGE MONTHLY PAN EVAPORATION
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

(FEMA). The FIRM Map, Community Panel No. 06021C0400D, dated August 5, 2010, is shown on Figure 7.

2.5 Aesthetics

This facility is surrounded by farmland. Paul Violich Revocable Trust; Violich Farms, Inc.; and Alcatraz Farming, Inc. have purchased this facility and surrounding ground. Violich Farms will complete planting almond orchards on the ground previously used for wastewater disposal in 2020. This facility has housed bovines since the late 1970s and there will be no change in aesthetics to the feedlot facility. The closest urban area is 2.5 miles from the facility.

2.6 Topography

Topography of the facility slopes gently to the southeast. The elevation of the site ranges from approximately 730 feet above sea level at the northwest corner of the property (the intersection of Highway 99W and County Road 25) to approximately 660 feet above sea level at the southwest corner of the property near the intersection of Highway 99W and County Road 28.

2.7 Soils Information

The soils in the immediate vicinity of the feedlot facility, including the area of the wastewater ponds, are composed of Cortina very gravelly sandy loam. The Cortina series consists of excessively drained soils on recent gravelly alluvium from schistose, sedimentary, and metavolcanic rocks. These soils are characteristically gravelly or very gravelly and coarse textured or moderately coarse textured. They are shallow to moderately deep over channel sand and gravel. These soils typically have a light brownish-gray or grayish-brown surface layer that is slightly acid. The soil depth to sand and gravel is more than 36 inches. Permeability is very rapid and the available moisture holding capacity is 3 to 5 inches. Cortina series soils generally occupy narrow areas that are small or medium in size. Cortina soils are of limited agricultural value due to low water retention capacities. In this area, the Cortina series overlays the Stony Creek alluvial fan. Site soils are summarized in additional detail in Appendix D.

2.8 Local Well Information

As required by the General Order, the locations of surrounding monitoring and water supply wells within 600 feet of the site are included on Figure 8. Detailed information on the monitoring wells is provided in Section 5.

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SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; FEMA 2019

FIGURE 7
FEMA FLOOD ZONES
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

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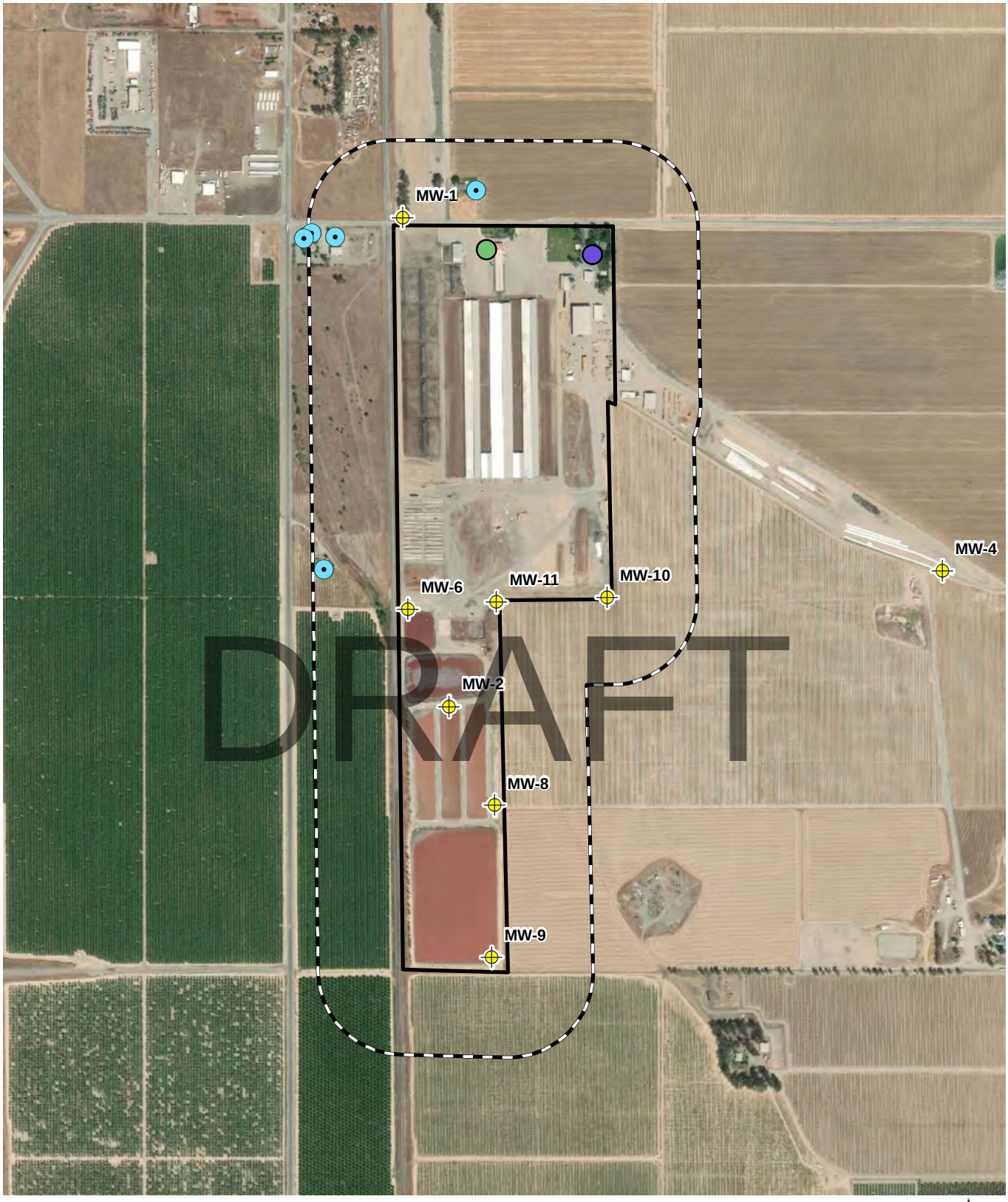

Monitoring Well
Offsite Well
Barn Well
Current Lease Area
Domestic Well
600-Foot Buffer Around Current Lease Area

N

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0 500 1,000 2,000 Feet

FIGURE 8
WELL LOCATIONS WITHIN 600 FEET
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

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3.0 CONSTRUCTION SPECIFICATIONS

A Conditional Use Permit to expand the previous dairy was approved by the Glenn County Department of Planning and Public Works on December 19, 2007. The expansion included increasing the herd size to 5,567 AU and adding shade structures; a Saudi-style freestall, hay, and new maternity barns. In addition, the three wastewater storage ponds and the emergency overflow detention basin constructed in 2006 were added to the Use Permit.

3.1 Site Drainage

The corral drainage and any flush water from the barns flows to sumps located at the south end of the corral area and barns where it is collected into sumps and pumped to the wastewater lagoons via and underground piping system. All corral areas are constructed to direct contaminated runoff to the sumps hence to the wastewater ponds as shown on Figure 9.

Barn roof drains collect clean runoff where it is conveyed to the non-contact stormwater pond located east of the corrals (see Figure 9). This water percolates into the ground.

3.2 Structures

Onsite structures to be used by the feedlot are summarized in Table 3 and shown on Figure 9.

Table 3
CURRENT BUILDINGS AND APPURTENANCES

Structure	Size (feet)	Year Constructed
Freestall Barn 1	1260 x 106	2000
Freestall Barn 2	1260 x 106	2000
Shop	60 x 70	1948
Feed Barn	100 x 60	1969
Hay Barn 1	70 x 70	1948
Hay Barn 2	70 x 100	1948
Hay Barn 3	80 x 120	Unknown
Pole Barn	200 x 130	2002
Milking Parlor	300 x 60	2000
Maternity Barn	100 x 60	1970
Office	60 x 50	1920s
Freestall Barn	1260 x 130	2008
Shade Structures (10)	30 x 120	2012
Saudi-Style Barn	1260 x 80	2008
Hay Barns	88 x 300	2014

3.3 Wastewater Generation

In 2016 the dairy installed a cattle cooling system in all freestall barns. The mist/sprinkler water is conveyed to the storage ponds. This is anticipated to be the only wastewater generated onsite. Most of this water is lost to the atmosphere. A small percentage may be retained in the storage

FIGURE 9
SURFACE DRAINAGE MAP
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

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ponds. The system will be used only during the summer months when evaporation is greater than precipitation.

3.4 Pond Capacity and Construction Details

There are six wastewater ponds onsite. Pond 1 is used for flush water storage. Ponds 2, 3, 4, and 5 are used for additional wastewater storage as needed and to provide improved sediment removal. Pond 6 serves as an emergency pond for use only in times of heavy precipitation. Pond construction details are shown in Table 4. All wastewater ponds were constructed with clay liners.

Table 4
POND INFORMATION

Pond ID	Top Water Surface Area (sq feet)	Bottom Surface Area (sq feet)	Side Slopes	Depth (feet)	Storage Volume Available (cu feet)[1]
1	52,975	22,810	3.3:1	12.5	473,656
2	173,580	104,970	4:1	11.5	1,601,662.5
3	105,790	44,890	3:1	12	904,080
4	103,810	44,140	3:1	12	887,700
5	106,505	47,820	3:1	12	925,950
				Total Pond Volume	**4,793,050**
Overflow	543,735	499,580	3:1	6	3,129,945
				Contingency Pond Volume	**3,129,945**

Notes: 1 Storage volume does not include 2 feet of freeboard (No Discharge Technical Report, VESTRA 2015)

Kleinfelder designed Ponds 1 and 2 for the original dairy in 2001. These ponds were lined with 24 inches of clay material compacted to 90 percent relative compaction with a permeability of 10^{-6} centimeters per second (cm/sec) or less. Additional details are available in the *Geotechnical Investigation Report, Proposed Verboom Dairy Ponds, Orland, California* (Kleinfelder, 2001b). Ponds 3, 4, 5, and 6 were installed in 2006. These ponds were lined with 12 inches of clay material compacted to 95 percent relative compaction with a permeability of 10^{-6} cm/sec or less.

Ponds will be dry by mid-October each year to allow for pond cleaning as well as provide storage capacity for rainy seasons and stormwater runoff.

3.5 Wastewater Capacity Calculation

As summarized in Table 4 and documented in the No Discharge Technical Report, Notice of Non-Applicability Order 2014-0057-DWQ (VESTRA, 2015) and in the Waste Management Plan Update (VESTRA, 2016); the Available Storage Capacity (which excludes 2 feet of freeboard) in the six onsite wastewater storage ponds is approximately 8,000,000 cubic feet or 180 acre-feet. These ponds were constructed by the former dairy and will be used to contain all wastewater runoff from the feedlot facility.

To determine if the existing wastewater ponds have 1) sufficient capacity to meet the rainfall criteria outlined in Attachment B – Waste Management Plan, Waste Discharge Requirements

General Order R5-2017-0058, and 2) sufficient surface area to evaporate the water stored in the ponds prior to the next winter season, a monthly annual water balance for the facility was conducted. Key input parameters for the water balance are presented in Table 5. Additional details and supporting information are presented in Appendix E.

Table 5
WATER BALANCE INPUT PARAMETERS

Parameter	Value	Units	Source
Average Annual Precipitation	29.91	inches	See Table 2
Precipitation Factor	1.5	---	Order R5-2017-0058, Attachment B
25-year, 24 hour design storm	3.89	inches	NOAA Atlas 14, Volume 6, Version 2, Orland 04-6506
Average Annual ETo	50.46	inches	See Table 2
Evaporation Factor	1.1	---	Conservative estimate to calculate pond evaporation from reference ETo
Total Pond Surface Area	25	acres	Table 4
Average Pond Surface Area	21	acres	Calculated
Runoff Area	50.5	acres	From Site Plan
Runoff Factor	0.4	fraction	Conservative estimate based on 2016 WMP Update
Compost Area	3.5	acres	From Site Plan
Compost Water Use	0.0921	aft/acre/month	Based on water use at a compost facility in Orland

Based on the result of the water balance, the Maximum Water Storage Volume required based on the input parameters presented in Table 5 is approximately 3,500,000 cubic feet or 80 acre-feet at the end of March. This Maximum Water Storage Volume is less than the Available Storage Capacity of the wastewater ponds of 8,000,000 cubic feet. Based on this calculation, the wastewater ponds have sufficient capacity to meet the rainfall criteria outlined in the General Order, Attachment B. The water balance included the required precipitation factor of 1.5.

Furthermore, based on the results of the water balance, the wastewater ponds will be dry by the end of August. This conclusion is based on the assumption that it may be necessary to manage residual water in the wastewater ponds to maximize evaporation following wet winter seasons. For example, if only Ponds 1 through 5 are used for water storage during a wet winter, it may be necessary to transfer water from these ponds into Pond 6 during the summer months to maximize surface evaporation.

4.0 OPERATION AND MAINTENANCE PLAN

4.1 Operating Hours

The feedlot facility will operate seven days a week from 6 a.m. to 5 p.m., Monday through Sunday, and will employ six full-time workers.

4.2 Mortality Management Plan

Dead animals will be immediately removed from corrals or barns and temporarily relocated to an isolated site away from both County Road 27 and Railroad Avenue, out of public view, until removal. Dead animals will be disposed of in a way that does not adversely affect ground or surface water. During the summer months, lime will be applied to the area for sanitation and odor mitigation.

Sacramento Rendering Company pick-up days are Monday, Wednesdays and Fridays. Mission Livestock will have a better percentage basis for mortality numbers at the feedlot following an operational period. The previous dairy had many upgrades to the facility including more areas for shade and more room for animals to be housed. The previous death loss was between 4 and 6 percent. The feedlot will apply BMPs to ensure their livestock are treated humanely with adequate food, water, and shelter from weather elements. The industry standard for feedlot mortality according to the agweb.com Cattle Network is about 2 percent.

As required, the contact information for Sacramento Rendering Company is:

Sacramento Rendering Company
11350 Kiefer Boulevard
Mather, California 95830
airyourthoughts@SRCCompanies.com
1-800-339-6493

4.3 Manure Management

The average manure generation will be approximately 21.5 pounds per head per day at 65 percent dry matter. With an average of 7,100 cattle at the feedlot facility, roughly 152,650 pounds per day of manure will be generated. Tons of manure per year is estimated at 27,858 tons. Barns will be scraped or vacuumed daily.

The main storage area for manure is between the barns and ponds. Manure is currently composted in this area. Composting will continue under the new operation. Manure will be removed from the barns by a loader or vacuum. In the winter months, if sufficient volume in the detention ponds is available, some flushing may occur. Scraping or vacuum will be used during the summer season. The plan is to pave the manure composting area. The new operator is evaluating manure removal options and may use a combination of flushing, scraping, and vacuuming in the barns. External pen areas will be scrapped.

If the barns are flushed, the wastewater will run through the separator. The separator will remove the 20 to 30 percent of waste solids with a stationary screen, and the water will continue on into the ponds with solids redirected to composting piles. If necessary, some manure will be removed from the site.

4.4 Composting

Manure at the dairy is currently composted and used as bedding. Manure composting will continue under the feedlot operation. Winter composting will be conducted on a low-permeable surface (compacted material or asphalt). Water from the ponds may be used to provide moisture to the compost. The composting operation meets the definition of "agricultural composting" under the current Order WQ 2015-0121-DWQ *General Waste Discharge Requirements for Composting Operations* and would be exempt from the requirements of the Order. If required to do so, the facility will limit the production of compost to no more than 25,000 cubic yards processed onsite at any given time to meet the requirements of the pending amendment to the Order dated October 31, 2019 (not yet adopted).

4.5 Backflow Prevention Devices

No land application of wastewater will occur. The barn well and domestic well are separate from any wastewater connections and only supply fresh water to the existing barn and residence. In the feedlot operation, there will be no wastewater application to surrounding croplands. Backflow protection was in place in all wells associated with the previous dairy operation.

4.6 Chemical Use

Mission Livestock will focus on BMPs and good housekeeping to suppress weeds and algae in the ponds. Maintaining flows of water between the ponds and maintaining minimal depth of pond water will help to facilitate maximum evaporation through solar heating of the stored water and will help limit algae and aquatic plant growth. Limited chemicals will be used in addition to the facility's BMPs. Any chemicals used will be administered, stored, and disposed of according to the product labels and in accordance with Federal and State laws and regulations.

Glyphosate (Roundup) will be used for weed control. Glyphosate is the most commonly used broad-spectrum, non-selective systemic herbicide in the United States. It is categorized as a phosphonomethyl amino acid. This herbicide is widely used in forestry, agriculture, residential, and industrial areas. Roundup kills both broadleaf plants and grasses. It works by preventing plants from making certain proteins that they need for plant growth. The product is absorbed through the leaves and translocated throughout the plant. It concentrates in the meristem tissue where it stunts growth, malforms and discolors leaves, and causes plant death. This enzyme is not present in mammalian systems.

Livestock pharmaceuticals will be stored in a temperature-controlled room with an electronically controlled access pharmaceutical dispenser.

4.7 Salt Management

Feedlot rations need to contain essential vitamins and minerals for proper nutrition. Most feedlot rations provide enough trace minerals with the exception of calcium, phosphorus, and salt. Hay and grain rations should be tested for mineral content. In a beef feedlot project, salt must be provided. Lose ground salt should be available for free choice feeding. Salt needs to be kept covered and in an area where it cannot penetrate into the ground. Salt could also be included in a complete ration at a rate of 0.3 percent of the ration when it is uniformly mixed and separation of ingredients is not a problem. Cattle feeders that use feedlot manure as fertilizers should keep salt levels at 0.2 to 0.3 percent of the ration. When salt is kept at these levels, it will not contribute to salt pollution. Good nutrition with proper vitamins, minerals, proteins, and salts can prevent many diseases and deficiencies.

4.8 Wastewater Pond Management

To help manage wastewater, a mechanical separator will be used to remove any solid material greater than 0.025 inches in diameter from the water stream before entering Pond 2. The removal of solids prevents buildup of material in the ponds that could serve as a surface for breeding pests. Solids that are removed by the separator are then stored on a concrete apron adjacent to the processing pits prior to composting.

Ponds will be dry by mid-October each year to allow for pond cleaning as well as ensuring sufficient storage holding for incoming rainy seasons and stormwater runoff.

Mission Livestock will apply BMPs and good housekeeping as follows:

- Daily pest and vector control
- Odor control from proper manure and pond management
- Daily barn flushing, scraping, or vacuuming
- Pond agitation
- Careful management of internal composting temperatures
- Regular removal of compost offsite
- Follow recommended inspection schedules
- Follow current Waste Discharge Requirements (WDR)
- Follow careful health management procedures for cattle (vaccinating and worming schedule)
- Supply adequate nutrition, water, and shelter to cattle
- Ensure employees are properly trained in BMPs

4.9 Vector Control

Glenn County has a fogging schedule for mosquito control from May through October 2020. The feedlot facility is in an area that will be sprayed once a week; see glennmosquito.specialdistrict.org/fogging-schedule for more information. The feedlot will use BMPs to ensure no stagnant or standing waters will be contributing to the breeding of mosquitoes.

Fly control is another area of BMPs that will be used at the facility. Manure removal, composting, fly tape, fly traps, and fly predators will be used as a means to control fly populations. Mission Livestock will utilize fly predators as a biological control, fly traps as a mechanical control, and efficiency of manure to compost management as a cultural control. Standing water will be minimized. Insecticides will be used as a last resort.

5.0 WELL MONITORING AND SAMPLING PLAN

5.1 Current Monitoring Network

A monitoring well network was established under the individual WDRs (R5-2008-0122) associated with Greenwood Dairy. The well locations and most recent groundwater elevation contours are shown on Figure 10. A number of these wells will be abandoned in spring 2020. Monitoring Wells MW-2, MW-6, MW-8, and MW-9 are associated with the wastewater ponds and will be retained for future sampling. In addition, Monitoring Well MW-10 will be retained because it is associated with the composting area used by the dairy operator. Monitoring well details are shown in Table 6.

Table 6
MONITORING WELL CONSTRUCTION DETAILS

Well No.	Installation Date	Construction Material	Total Depth (ft bgs)	Screened Interval (ft bgs)	Sand Interval (ft bgs)	TOC Elevation (ft above msl)
MW-1[1]	3/28/01	2-inch Sch. 40 PVC	46.5	20-45	18-46.5	221.28
MW-2	1/4/01	2-inch Sch. 40 PVC	50	20-50	18-50	214.59
MW-4	3/27/01	2-inch Sch. 40 PVC	46.5	20-45	18-46.5	206.68
MW-5	3/27/01	2-inch Sch. 40 PVC	46.5	20-45	18-46.5	228.10
MW-6[1]	1/4/01	2-inch Sch. 40 PVC	40	19-49	17-49	213.06
MW-8	3/20/08	2-inch Sch. 40 PVC	45	25-45	23-50	210.28
MW-9	3/20/08	2-inch Sch. 40 PVC	50	30-50	26-50	207.30
MW-10	1/14/08	2-inch Sch. 40 PVC	45	20-45	18-45	209.52
MW-11	1/14/08	2-inch Sch. 40 PVC	50	30-50	25-50	215.93

Notes:
bgs = below ground surface, msl = mean sea level, TOC = top of casing
[1] Screened intervals were modified in the Second Semi-Annual 2010 Monitoring Report to reflect the actual total depths for the two wells measured in the field; the well identification numbers are believed to have been interchanged during late 2001.
MW-3 was abandoned pursuant to RWQCB approval on 11/30/11.
MW-7 was abandoned during construction of Ponds 3, 4, 5, and 6 in March 2008.
MW-1, 4, 5, and 11 are to be abandoned spring 2020.
MW-2, 6, 8, 9, and 10 will be retained.

5.2 Groundwater Monitoring

Monitoring wells that are going to be retained onsite are MW-2, MW-6, MW-8, MW-9, and MW-10. These wells were last sampled on May 30, 2019, and have been sampled quarterly since 2001.

Previous sampling of monitoring wells, irrigation and domestic wells has been performed in accordance with WDR Order No. R5-2008-0122. Historical irrigation and domestic well groundwater analytical data are included in the Second Semi-Annual 2019 Report (VESTRA, January 2020). Most recent groundwater elevations are summarized in Table 7. Groundwater flow direction is shown on Figure 10. Historical groundwater analytical data are included in Appendix F.

GROUNDWATER GRADIENT 0.0047 FT/FT ON MAY 30, 2019

LEGEND

- GROUNDWATER FLOW DIRECTION
- 176 GROUNDWATER ELEVATION CONTOUR
- PROPERTY BOUNDARY
- MW-9 158.82 MONITORING WELL W/GROUNDWATER ELEVATIONS
- (3) FIELD NUMBER

N

0 750 1,500 3,000 Feet

VESTRA

FIGURE 10
GROUNDWATER ELEVATION CONTOURS
MAY 2019
MISSION LIVESTOCK
GLENN COUNTY, CALIFORNIA

P:/Projects/2020/72007 Mission Livestock/Figures/Figure 10_GW Elevations.srf

Table 7 GROUNDWATER ELEVATIONS MAY 2019				
Well No.	**TOC Elevation (ft above msl)**	**Screened Interval (ft bgs)**	**Depth to Groundwater (ft below TOC)**	**Groundwater Elevation (ft above msl)**
MW-1	221.28	20-50[1]	43.26	178.02
MW-2	214.59	20-50	49.31	165.28
MW-4	206.68	20-45	45.62	161.06
MW-5	228.1	20-45	30.85	197.25
MW-6	213.06	19-49[1]	45.39	167.67
MW-8	210.28	23-50	Dry	--
MW-9	207.3	26-50	48.48	158.82
MW-10	209.52	18-45	45.12	164.4
MW-11	215.93	25-50	47.99	167.94

Note: [1] Screened intervals were modified in the Second Semi-Annual 2010 Monitoring Report to reflect the actual total depths for the two wells measured in the field; the well identification numbers are believed to have been interchanged during late 2001.

The monitoring network will be sampled annually going forward. Monitoring of the barn well and domestic well, as required in the General Order, will be discontinued. The monitoring wells will be sampled for the parameters in the General Order including:

- Field measurement of electrical conductivity and ammonium nitrogen
- Nitrate nitrogen
- General mineral (calcium, magnesium, sodium, potassium, bicarbonate carbonate, sulfate chloride, and total dissolved solids)
- Elevation

6.0 INSPECTION SCHEDULES

6.1 Production Area

Weekly/Monthly:

Weekly during the wet season (1 October to 31 May) and monthly between 1 June and 30 September (to be completed on the 1st day of each month):

- Inspect all feed, bedding, and waste storage areas (solid manure and liquid waste).
- Document any conditions or changes that could result in discharges to surface water and/or from property under control of the Discharger.
- Note whether freeboard within each liquid waste storage structure is less than, equal to, or greater than the minimum required (2 feet for aboveground ponds and 1 foot for belowground ponds)
- Document any issues with flow meters, berm integrity, cracking, slumping, erosion, excess vegetation, animal burrows, or seepage.
- Inspect the animal confinement area(s), raw materials storage area(s), and solid waste storage area(s) for proper drainage to the wastewater management system within 12 hours after the end of each major storm event (one inch of precipitation within 24 hours).
- Visual inspections of wastewater containment structures for discharge, freeboard, berm integrity, cracking, slumping erosion, and seepage.
- Photograph each pond showing the height of wastewater relative to the depth marker and the current freeboard on that date.
- All photographs shall be dated and maintained as part of the Discharger's record.

Annually:

- Inspect aboveground pipes and/or pumps that are part of the wastewater management system for leakage, and repair as necessary.

6.2 Composting Operation

Quarterly:

- Inspect working surfaces, berms, ditches, perimeter, erosion control BMPs, and any other operational surfaces for cracking, subsidence, ponding on working surfaces or within ditches, effectiveness of erosion control, maintenance activities, and evidence of any uncontrolled water or wastewater leaving or entering the operation area.
- Photograph observed and corrected deficiencies.

Annually:

Prior to the wet season (no later than August 31):

- Survey the composting operation to confirm that all containment structures are prepared for the pending wet season.
- Complete repairs by 1 October.
- Include this information in the annual monitoring and maintenance report.

After Major Storm Events (a minimum of 1 inch of precipitation within 24 hours):

- Inspect all precipitation, diversion, and drainage facilities for damage within 7 days following major storm events.
- Necessary repairs shall be completed within 30 days of the inspection.
- Report any damage and subsequent repairs, including photographs of the problem and repairs, in the annual monitoring and maintenance report portion of the annual report.

6.3 Other Monitoring Requirements

No surface water monitoring or pesticide sampling is required.

6.4 Pond Sampling

No pond sampling will be required because there will be no land application of wastewater.

6.5 Land Application

Mission Livestock will not be using land application as a part of their feedlot practices.

6.6 Tailwater Pond

There is no tailwater pond or land application.

6.7 Farm Water Quality Plan

No water quality plans are required because there is no land application at the feedlot facility.

7.0 REFERENCES

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Appendix A

Notice of Intent

ATTACHMENT A
ORDER R5-2017-0058

NOTICE OF INTENT
FOR
CONFINED BOVINE FEEDING OPERATIONS

Instructions:

1. Complete and submit to the appropriate Central Valley Board Office. Submittal information is located at the end of the Form. **Please include a map with a scale showing the production and land application areas**.
2. Mail the appropriate fee to the State Water Resources Control Board at:

   SWRCB Accounting Office
   ATTN: Annual Fees
   P.O. Box 1888
   Sacramento, CA 95812-1888

FACILITY TYPE CALF _____ HEIFER_____ BEEF CATTLE X_____

OTHER (DESCRIBE) _____

CONTACT INFORMATION AND HISTORY

A. NAME OF FACILITY: n Livestock

1. FACILITY ADDRESS: 69 County Road 27 Orland 95963
   Number and Street City Zip Code

   STREET AND NEAREST CROSS STREET (IF NO ADDRESS): _____

2. COUNTY:_____

3. COUNTY ASSESSOR PARCEL NUMBER(S) FOR FACILITY (Production Area):

   _____

4. IS THERE CROPLAND ASSOCIATED WITH THIS FACILITY THAT MAY RECEIVE WASTE OR OTHER MATERIAL FROM THE FACILITY?

   ☐ NO

   ☐ YES; IF YES, ACREAGE _____

   IF YES, HOW MUCH CROPLAND IS ENROLLED UNDER ILRP?

   ☐ ALL

   ☐ SOME

   ☐ NONE

5. COUNTY ASSESSOR PARCEL NUMBER(S) FOR ASSOCIATED CROPLAND (Land Application Areas):

_____

_____

_____

B. OPERATOR NAME:_____ TELEPHONE NO: (510) 996-8455

OPERATOR MAILING ADDRESS: _____on, CA 95620_____
Number and Street City Zip Code

EMAIL ADDRESS: _____

C. NAME OF LEGAL OWNER OF THE FACILITY: Violich Rev Trust/ Violich Farms Inc.

LEGAL OWNER MAILING ADDRESS: _____
Number and Street City Zip Code

CONTACT PERSON: _____ TELEPHONE NO: _____

EMAIL ADDRESS: _____

D. WHEN DID/WHEN WILL YOU BEGIN OPERATIONS AT THE FACILITY? ____/____/_____
Month Day Year

E. PERSON TO RECEIVE REGIONAL BOARD CORRESPONDENCE (OWNER OR OPERATOR OR BOTH)

A. OWNER: _____
B. OPERATOR: _____
C. BOTH: _____

TYPE OF ANIMALS AND SIZE OF THE OPERATION

Provide the principal breed of animals and the number of animals housed at the facility:

Principal Breed Mixed Beef Breed

Current Number of Animals			Largest number in single month over last 3 years (month: year:)		
Type of Animal	Head	AUs[1]	Type of Animal	Head	AUs
Beef Cattle	7,100	0.60	Beef Cattle		
Mature cows			Mature cows		
Bred heifers			Bred heifers		
Heifers (1-year to breeding)			Heifers (1-year to breeding)		
Calves (3 months to 1 year)			Calves (3 months to 1 year)		
Baby Calves (under 3 months)			Baby Calves (under 3 months)		
TOTAL	7,100 Head	4,260 AUs	TOTAL	Head	AUs

For Auction Markets only: Number of Pens _____
Total Area of Animal Housing (sq. ft.)_____

Animal Housing:
Describe how the animals are/will be housed (freestalls, calf hutches, open corrals, covered corrals, pasture, etc.) If more than one type of housing will be used, describe how many animals will be housed in each manner:

[1] See Animal Unit Conversion Table at end of NOI for instructions for converting to Animal Units

WASTE PRODUCTION AND REUSE

A. WASTE CONTAINMENT:
DO YOU HAVE A WASTEWATER LAGOON(S)? Yes How many? 5
SETTLING BASIN(S)? Yes How Many? 1

DO ANY OF THE LAGOONS OR BASINS HAVE LINERS? X YES ___ NO

IF YES, PLEASE DESCRIBE (e.g. EARTHEN, CONCRETE-LINED, SYNTHETIC LINER):

ɔsynthetic filter fabric

B. WASTE REUSE:
DO YOU APPLY WASTEWATER TO CROPLAND THAT IS PART OF YOUR FACILITY?
_____YES X NO

DO YOU APPLY SOLID MANURE AND/OR BEDDING TO CROPLAND THAT IS PART OF YOUR FACILITY? _____YES X NO

- ☐ IF YES, ACREAGE: _____
- ☐ IF YES, DO YOU HAVE IRRIGATED LANDS REGULATORY COVERAGE?
  - ☐ YES
  - ☐ NO

DO YOU APPLY BIOSOLIDS, WHEY OR OTHER WASTE TO CROPLAND THAT IS PART OF YOUR FACILITY? _____YES X NO

C. WASTE REMOVAL:

DO YOU TRANSFER SOME OR ALL OF YOUR SOLID MANURE AND/OR BEDDING TO OTHER PERSONS? _____YES _____NO

DO YOU TRANSFER SOME OR ALL OF YOUR WASTEWATER TO OTHER PERSONS?
_____YES _____NO

D. FLOOD PROTECTION/RUNOFF CONTROLS

Is there a stream or other waterway located on or bordering your facility?
_____Yes _____ No

If you checked “Yes”, please describe the practices used to prevent animals from entering the waterway:

Is storm water runoff that contacts animal wastes fully retained on the facility? ___ Yes ___ No

Describe how storm water runoff is controlled and where it is stored:

E. COMPOSTING OPERATIONS
Does your facility include a composting operation? _____Yes _____No

If so, complete Attachment A-1 describing your composting operation.

F. DO YOU MEET THE CRITERIA FOR THE LIMITED TIME OPERATION TIER IDENTIFIED IN FINDING 4 OF THE BOVINE GENERAL ORDER?

☐ NO
☐ YES

IF YES, CONFIRM THE FOLLOWING ABOUT YOUR OPERATION:

4.a.

☐ BOVINE ANIMALS ARE HOUSED FOR FEWER THAN 24 DAYS PER CALENDAR MONTH.

4.b.

☐ ALL MANURE IS EXPORTED

OR

☐ CROPLAND THAT HAS MANURE APPLIED IS COVERED UNDER THE IRRIGATED LANDS REGULATORY PROGRAM

4.c.

☐ MANURE IS STORED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION

OR

☐ MANURE IS STORED IN A STORAGE AREA THAT HAS A LOW PERMEABILITY SURFACE AND FEATURES TO CONTROL RUN-ON OF WATER ONTO THE PAD, AND RUN-OFF OF LIQUID FROM THE PAD, AND THROUGHOUT THE WET SEASON WHEN NECESSARY (AND AT A MINIMUM ONE DAY PRIOR TO ANY FORECASTED MAJOR STORM EVENT, WHICH IS ONE INCH OF PRECIPITATION WITHIN 24 HOURS), MANURE IS EITHER REMOVED FROM THE SITE OR COVERED WITH A WEATHERPROOF COVERING SUCH THAT RUNOFF LEAVING THE STORAGE AREA WILL NOT HAVE CONTACTED MANURE.

4.d.

☐ COMPOSTING OF MANURE IS CONDUCTED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION, AND ON CONCRETE OR AN EQUIVALENT LOW PERMEABILITY SURFACE, AND FREE LIQUIDS ARE NOT RELEASED DURING THE COMPOSTING PROCESS.

OR

☐ THE COMPOSTING IS REGULATED SEPARATELY UNDER THE COMPOSTING GENERAL ORDER

4.e.

☐ CORRAL RUNOFF IS STORED IN POND(S) THAT ONLY CONTAIN WATER SEASONALLY AND ARE OTHERWISE DRY, AND THAT DO NOT RECEIVE WASTEWATER FROM ANY SOURCE OTHER THAN CORRAL RUNOFF.

G. DO YOU MEET THE CRITERIA FOR A LIMITED POPULATION OPERATION TIER IDENTIFIED IN FINDING 5 OF THE BOVINE GENERAL ORDER?

☐ NO
☐ YES

IF YES, CONFIRM THE FOLLOWING ABOUT YOUR OPERATION:

5a.

☐ BETWEEN 6 AND 99 ANIMAL UNITS[2] ARE HOUSED AT YOUR FACILITY

5b.

☐ ALL MANURE IS EXPORTED

OR

☐ CROPLAND THAT HAS MANURE APPLIED IS COVERED UNDER THE IRRIGATED LANDS REGULATORY PROGRAM

5c.

☐ CORRAL RUNOFF IS STORED IN POND(S) THAT ONLY CONTAIN WATER SEASONALLY AND ARE OTHERWISE DRY, AND THAT DO NOT RECEIVE WASTEWATER FROM ANY SOURCE OTHER THAN CORRAL RUNOFF.

5.d.

☐ COMPOSTING OF MANURE IS CONDUCTED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION, AND ON CONCRETE OR AN EQUIVALENT LOW PERMEABILITY SURFACE, AND FREE LIQUIDS ARE NOT RELEASED DURING THE COMPOSTING PROCESS.

OR

☐ THE COMPOSTING IS REGULATED SEPARATELY UNDER THE COMPOSTING GENERAL ORDER

ADDITIONAL INFORMATION

PREVIOUS SUBMITTAL OF REPORT OF WASTE DISCHARGE

HAVE YOU PREVIOUSLY SUBMITTED A REPORT OF WASTE DISCHARGE? _____YES _____ NO

IF SO, WHEN WAS IT SUBMITTED?_____

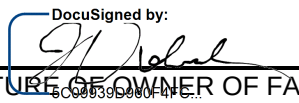
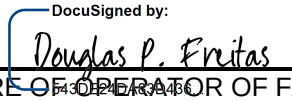
FACILITY NAME USED:_____

Please attach a map of your facility. The map should show the roads adjacent to the confined bovine feeding operation, the locations of creeks, wells, major buildings, animal housing, waste storage facilities, irrigation lines, drainage channels, and the names, APNs, and location of any fields that receive wastewater, manure, or used bedding.

[2] 1 Animal Unit (AU) equals 1,000 pounds of animal weight

CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

DocuSigned by:  5C99939B980F41E...	DocuSigned by:  248DF1D8553A46...
SIGNATURE OF OWNER OF FACILITY	SIGNATURE OF OPERATOR OF FACILITY
PRINT OR TYPE NAME	PRINT OR TYPE NAME
4/1/2020	4/1/2020
TITLE AND DATE	TITLE AND DATE

NOI SUBMISSION INSTRUCTIONS

The NOI for facilities in Fresno, Kern, Kings, Madera, Mariposa, and Tulare counties should be submitted to the California Regional Water Quality Control Board, either as a *.pdf by email to:

centralvalleyfresno@waterboards.ca.gov

or by mail to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706
Attention: Confined Animal Regulatory Unit

The NOI for facilities in all other counties should be submitted either as a *.pdf by email to:

centralvalleysacramento@waterboards.ca.gov

or by mail to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670
Attention: Confined Animal Regulatory Unit

When you submit the NOI to the Central Valley Water Board, please be sure to **include a copy of the check** that you send to the State Water Resources Control Board for the fee. A link to the fee schedule can be found here:
https://www.waterboards.ca.gov/resources/fees/water_quality/

Mail the appropriate fee to the State Water Resources Control Board at:

SWRCB Accounting Office
ATTN: Annual Fees
P.O. Box 1888
Sacramento, CA 95812-1888

CALCULATION OF ANIMAL UNITS (AU)

To complete the table below, enter the number of head in column A. Then multiply the number by the appropriate factor and enter the results in column B. For mature cows, multiply the results in column B by an adjustment factor as needed and enter the results in columns C and D. For animals other than mature cows, copy the numbers in column B into column D.

			A	B	C	D
		Factor	Head	AU	**Adjustment for**	**Total**
	ANIMAL				**Breed**	**AUs**
					AU times 1.0, 1.2, or 1.4	
1.	Milk or Dry Cows	1.0	0			
2.	Heifers (2 years and older)	0.73	0			
3.	Heifers (1 year to breeding)	0.73	0			
4.	Calves (3 months to 1 year)	0.35	9,000	3,150		3,150
5.	Baby Calves (< 3 months)	0.21	0			
6.	Beef Cattle	1.2	0			
7.	Total					3,150

Adjustments for Animal Breed: The AU values above are based on a 1,000-pound AU per Title 40 Code of Federal Regulations, Section 122, and can be used directly for mature Jersey cows. For mature Guernseys, multiply the AU values by 1.2; for mature Holsteins, multiply the AU values by 1.4.

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Appendix B

Glenn County Resolution CEQA and Use Permit

Select a Department

-- How do I...? --

Planning Commission, Glenn County

Planning Commission Minutes & Agendas

Planning Commission Streaming Media Archive

Archived videos are arranged by date, with the most recent at the top of the list. Click **Video** to watch the meeting with documents, or **Agenda / Minutes** to see just the documents. You can also search the archives by typing keywords into the Search box.

Live and Archived video can be viewed on most desktop browsers and a range of popular mobile devices. For additional information on supported platforms, please view the minimum system requirements.

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Enter keywords, ordinance o
This exact phrase:

One or more of these words:
or or
But none of these words:

Date Range:

through

Search Return to basic search

Clear Search

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Planning Commission	December 19, 2007	01h 54m	Agenda	Minutes	Audio

Item: 4. Conditional Use Permit #2007-002, Greenwood Dairy

Item: Motion to Approve the aforesaid matter. I move that the Planning Commission adopt the previously certified Confined Animal Facilities Element (CAFE) Program Environmental Impact Report (EIR) and the Statement of Overriding Considerations, which was originally adopted December 6, 2005 by the Glenn County Board of Supervisors. I further move that the Planning Commission find that on the basis of the Initial Study for **Conditional Use Permit #2007-002**, prepared by the Planning and Public Works Agency, that the Conditional Use Permit, as applied for by **Greenwood Dairy**, will not have a significant adverse effect on the environment because the codified County standards, Conditions of Approval, and Mitigation Measures (Air Quality, Hazards & Hazardous Materials, Hydrology and Water Quality, Transportation/Traffic, Utilities/Services, and Mandatory Findings of Significance/Human Health) shall reduce impacts to a less than significant level, except for the significant, cumulative, and unavoidable impacts recognized in the Statement of Overriding Considerations for the CAFE EIR. Therefore, a Mitigated Negative Declaration shall be granted with the Findings listed in the Staff Report. I further move that the Planning Commission approve **Conditional Use Permit #2007-002**, as applied for by Greenwood Dairy, on Assessor's Parcel Number: 024-100-017 et al. and that the Planning Commission has reviewed, analyzed and considered the Mitigated Negative Declaration that was recommended for this project and the Conditional Use Permit to be approved with the Findings listed in the Staff Report and the Mitigation Measures and Conditions of Approval as attached. Moved by William Carriere, seconded by Maurice L. Eakes.

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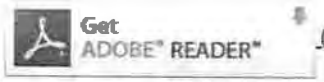
Maps (//countyofglenn.net/gis-data)



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PLANNING COMMISSION
COUNTY OF GLENN
WILLOWS, CALIFORNIA

MINUTES

DATE: **Wednesday, December 19, 2007**

TIME: **09:00 AM**

PLACE: **Board of Supervisors Room, Courthouse**
526 West Sycamore Street
Willows, CA 95988

* * *

I. ROLL CALL:

Brian Leach, Howard Cawthra, William Carriere, Maurice L. Eakes, and Richard T. Ramsey were present.

Daniel Obermeyer, Director, Mardy Thomas, Senior Planner, Andy Popper, Assistant Planner, and Casey Murray, Assistant Planner; of the Glenn County Planning & Public Works Agency were also present.

II. APPROVAL OF MINUTES:

On a motion from William Carriere, second by Howard Cawthra, it was unanimously voted to Approve the aforesaid matter. Approval of the Minutes of Planning Commission Meeting held on November 21, 2007.

III. PUBLIC HEARING:

1. Variance 2007-002, Gates Machinery Sales, Inc.

(A) CONSIDERATION OF CATEGORICAL EXEMPTION (B) CONSIDERATION OF VARIANCE

Murray presented the Staff Report.

Murray presented a letter from the Willows Baptist Church which explained their support for the project.

Public comment period opened.

No public comment.

Public comment period closed.

Commissioners discussed project.

On a motion from , second by , it was unanimously voted to .

2. Conditional Use Permit and Reclamation Plan # 94-01 Baldwin Contracting Company, Inc.

(A) DETERMINATION OF COMPLIANCE (B) CONSIDERATION PERMIT CONDITIONS AMENDMENT

Commissioner Leach noted that he received a legal notice in the mail and is within 300 feet of the proposed project. Commissioner Leach questioned Obermeyer regarding his participation in the hearing.

Obermeyer explained to Commissioner Leach that he needs to abstain and that he cannot participate in any discussions.

Thomas presented the Staff Report.

Thomas explained that this item has come before the Planning Commission as required by Condition of Approval #61, which requires a public review every five years.

Thomas explained that the project is longer within a Williamson Act contract and that the site is actively mined.

Thomas explained that staff has proposed revised Conditions of Approval so that they don't include codified sections of the law. He also explained that changes have been made to the timelines required for submitting cross sections due to stream flow changes and restrictions by the Department of Fish and Game.

Public comment period opened.

No public comment.

Public comment period closed.

Commissioners discussed project.

On a motion from William Carriere, second by Howard Cawthra, it was unanimously voted to Approve the aforesaid matter. I move that the Planning Commission find that Baldwin Contracting Company, Inc. is in compliance with the Conditions of Approval for **Conditional Use Permit #94-01 and Reclamation Plan** and adopt the revised Conditions of Approval as attached..

3. Tentative Parcel Map 2007-011, Frank Enos & Sons, Inc.

(A) RECOMMENDATION OF MITIGATED NEGATIVE DECLARATION TO BOARD OF SUPERVISORS (B) RECOMMENDATION OF PROJECT TO BOARD OF SUPERVISORS

Thomas presented Staff Report and explained that staff is seeking recommendation to the Board of Supervisors for approval to satisfy state laws regarding Williamson Act contracts.

Commissioner Leach questioned staff regarding the reason for splitting the land.

Thomas addressed Commissioner Leach's question.

Obermeyer explained to the Commissioners that staff will support projects like the one proposed because they will allow agricultural use to continue.

Public comment period opened.

Steve Butler, representative of the applicant, stated that they have no problems with the proposed Mitigation Measures or Conditions of Approval.

Public comment period closed.

On a motion from , second by , it was unanimously voted to .

4. Conditional Use Permit #2007-002, Greenwood Dairy

(A) MITIGATED NEGATIVE DECLARATION (B) CONSIDERATION OF PROJECT

Popper presented Staff Report.

Popper explained that recent information regarding the project was received and has been passed out for review.

Popper explained that Vestra, who is a consultant for the project, has prepared a presentation to be heard during the public comment period.

Public comment period opened.

On behalf of the applicant, Wendy Johnston of Vestra Resources, Inc., provided a presentation consisting of an overview of the project. The presentation included the background of the dairy, the proposed improvements and expansion.

Commissioner Leach explained that the particular dairy has a history of odor problems and questioned Johnston how more cows will create less odor.

Johnston addressed Commissioner Leach's question by explaining that additional cows will increase the economic viability of the facility which will provide more capital for improvements. Johnston also noted that the current operator has made significant improvements since acquiring the facility in 2001 and the incident of complaints has significantly decreased with the exception of the resident to the west.

Mike Carly, a veterinarian from Orland and owner of Mid Valley Vet Hospital, supplied three reasons to support the proposal: (1) out of all his clients, Daniel Vander Dussen does the best job to mitigate flies and odor, (2) the proposed improvements will create greater animal welfare, (3) all odor related impacts cannot be avoided or reduced. Additionally Carly added that the dairy supports economic development of the county.

Donnan Arbuckle spoke in support of the proposal. Arbuckle explained that the facility is a good operation and explained that dairies are good because they supply additional jobs and support the economics of the county.

Mike Rehse, property owner to the west, spoke in opposition of the proposal. Rehse was concerned about how more cows would create less odor. Rehse explained that the proposal would create more odor, dust, fly, and polluted runoff problems in the surrounding areas. Rehse explained that he hasn't made any complaints as of late because his complaints have gone nowhere. Rehse suggested that the Commission consider cutbacks to the herd size instead of allowing the herd size to increase.

Carol Fulton, of the Fulton Reclamation Facility, has property located south and east of the dairy and spoke in opposition of the proposal. Fulton explained that ground water monitoring wells on her property have been contaminated with pollutants from the dairy. Fulton questioned the adequacy of the monitoring wells located on the dairy site. Fulton explained that odors are more noticeable from the Greenwood dairy than other dairies in the area. Fulton was also concerned about the total number of animals on the site and explained that all animals produce odors.

Commissioner Leach asked Johnston if she could address the specific concerns of those opposed to the proposal, which include ground water concerns and number of animals on the site.

Johnston addressed the concerns of those opposed to the proposal. Johnston explained that manure piles would be adequately managed because they have had to comply with all the requirements of the Glenn County Environmental Health Department. Johnston explained that the dairy operator has monitoring wells in crop application areas. Johnston explained that the Regional Water Quality Control Board limits the number of cows at a dairy by the amount of available agricultural land for distribution of waste

water. Johnston explained that three additional ponds will help better achieve this process.

Johnston explained that dead cows will not be visible and will be removed twice a week from the site as required by the Glenn County Environmental Health Department.

Commissioner Cawthra questioned how many dead cows there are in a week.

Daniel Vander Dussen explained that he has about five dead cows per week.

Johnston explained that the number of cows on the site varies depending on how many are milking at any one time.

Commissioner Carriere questioned Johnston whether water is pumped to the north.

Johnston explained that water is pumped to the north and east. Johnston pointed out and explained the piping diagram for the waste water at the facility.

Commissioner Leach questioned Obermeyer regarding any future improvement plans for County Road 27.

Obermeyer explained that the County Road 27 project has been suspended due to insufficient funding.

Johnston added that a condition of approval has been proposed by the Public Works Department for additional right-of-way in front of the dairy facility for future road expansion and to pay fees for road improvements.

Popper stated as a clarification that the applicant has the option of an expanded right-of-way or supplying 50% of the cost for road improvement when the county improves the road. Popper also stated that there will be daily removal of animals between April 1 and October 31 due to high temperatures in the summer. Popper also stated that the applicant will have to pay an impact fee related to the weight of milk leaving the dairy.

Commissioner Cawthra questioned Johnston regarding the operation of the water monitoring program.

Johnston explained that Vestra has monitored the wells on the dairy site for the past two and a half years and all samples go to state certified labs as required by the Regional Water Quality Control Board.

Commissioner Cawthra questioned Johnston regarding the frequency of sending water samples.

Johnston explained that water samples are generally sent quarterly or bi-annually depending on the permit.

Commissioner Cawthra questioned Johnston regarding the action taken when water samples exceed an allowed figure.

Johnston explained the thresholds of waste water which are dependent on the beneficial use of the water and explained actions taken when water samples exceed certain thresholds.

Commissioner Cawthra questioned Johnston regarding the actions taken by the Regional Water Quality Control Board.

Johnston explained the state laws and Regional Water Quality Control Board requirements regarding waste water ponds.

Commissioner Cawthra questioned Johnston regarding nitrate levels from the continuous application of waste water on agricultural land.

Johnston explained nitrate levels as they relate to the agronomic rate or the amount of water the plants can use. Johnston explained that nitrates are found within shallow ground water whenever you have agricultural crops.

Commissioner Carriere questioned Johnston regarding an increase in the amount of waste water with an increase in the number of cows.

Johnston explained that she didn't have the information in front of her but explained that the waste water would increase during phase I.

Popper explained that the Staff Report says that the use of ground water will decrease because waste water from the dairy will be applied to the crops. Popper also explained that nothing will occur at the facility upon approval until the applicant has met all the requirements of the Regional Water Quality Control Board.

Johnston explained anaerobic decomposition methods related to the new waste water treatment ponds and explained that it is a best management practice to reduce odors.

Daniel Vander Dussen, Greenwood Dairy operator, explained management operations of the dairy, mitigation measures to reduce odor and dust, Regional Water Quality Control Board and Environmental Health requirements, and addressed questions and concerns previously brought to the attention of the Commission. Vander Dussen also explained that he wants to maximize the use of the dairy and believes the operation of the dairy will be better than before.

Commissioner Cawthra questioned Vander Dussen regarding odor from manure piles.

Vander Dussen explained the separator operation of the manure. Vander Dussen explained that the odor will come from the flush water versus the manure piles themselves. Vander Dussen explained the flush water and drainage related to the dairy.

Commissioner Cawthra questioned Vander Dussen of whether he lives on the dairy site.

Vander Dussen explained that he lives on the dairy site and explained the successes of the dairy over the last couple of years.

Fulton questioned if anything would prevent any future runoff coming onto her property and if planting trees would prevent airborne odors.

Popper added that the Board of Supervisors has adopted a Statement of Overriding Considerations acknowledging that cumulative impacts from increases in matter and ammonia emissions are unavoidable. Popper explained that impacts from the dairy have been addressed in the past with the adoption of the Confined Animal Facilities Element of the General Plan.

Commissioner Cawthra questioned staff of whether the project meets the requirements of the Confined Animal Facilities Element.

Popper stated that the Staff Report explains how the project meets the requirements of the Confined Animal Facilities Element. Popper also explained that the proposed mitigation measures will meet and go beyond the requirements of the Confined Animal Facilities Element.

Commissioner Cawthra questioned whether the project will meet directional requirements for windblown odors.

Obermeyer explained that some parts of the dairy existed before the new rules were in place. Obermeyer further explained that the project now comes under the new rules which put more restrictions on the dairy. In addition, Obermeyer explained that the Confined Animal Facilities Element explains that some issues can't be addressed, he explained the Right to Farm Ordinance of the county, he explained that the project will use best management practices to reduce impacts, and he explained that the project has safety valves which are in place with the proposed conditions of approval.

Commissioner Leach questioned Obermeyer regarding the status of the Brighton Ranch project located west of Interstate 5.

Obermeyer explained that the Brighton Ranch development is still in progress and an EIR is being prepared. Obermeyer explained that this

development is over one half mile west of the dairy so it is outside the buffer zone identified in the Confined Animals Facilities Element. Obermeyer added that the development may still be subject to occasional odors.

Commissioner Leach questioned Obermeyer regarding dairy generated odors and new development in the surrounding area.

Obermeyer explained that the dairy has been noted as a particularly smelly dairy, but Environmental Health has recognized this and has reviewed the project proposal. Obermeyer explained that the proposal is meant to fix the problems by implementing best management practices to reduce impacts and to make the dairy similar to other dairies. Obermeyer also explained that the dairy would now be more closely monitored with the new rules in place.

Public comment period closed.

Commissioners discussed the project and the positives for its approval.

Commissioner Carriere questioned staff whether water is allowed to leave property.

Popper stated that legally water is not allowed to leave property.

Obermeyer explained that the storm water retention ponds will contain water on site.

Commissioner Carriere questioned staff if the project is to be recommended to the Board of Supervisors.

Obermeyer explained that the project is a Conditional Use Permit and the Planning Commission is the approving body, but the approval of the Conditional Use Permit can be appealed to the Board of Supervisors.

On a motion from William Carriere, second by Maurice L. Eakes, it was unanimously voted to Approve the aforesaid matter. I move that the Planning Commission adopt the previously certified Confined Animal Facilities Element (CAFE) Program Environmental Impact Report (EIR) and the Statement of Overriding Considerations, which was originally adopted December 6, 2005 by the Glenn County Board of Supervisors. I further move that the Planning Commission find that on the basis of the Initial Study for **Conditional Use Permit #2007-002**, prepared by the Planning and Public Works Agency, that the Conditional Use Permit, as applied for by **Greenwood Dairy**, will not have a significant adverse effect on the environment because the codified County standards, Conditions of Approval, and Mitigation Measures (Air Quality, Hazards & Hazardous Materials, Hydrology and Water Quality, Transportation/Traffic, Utilities/Services, and Mandatory Findings of Significance/Human Health) shall reduce impacts to a less than significant level, except for the significant, cumulative, and unavoidable impacts recognized in the Statement of Overriding Considerations for the CAFE EIR. Therefore, a Mitigated Negative Declaration shall be granted with the Findings listed in the Staff Report. I further move that the Planning Commission approve

Conditional Use Permit #2007-002, as applied for by Greenwood Dairy, on Assessor's Parcel Number: 024-100-017 et al. and that the Planning Commission has reviewed, analyzed and considered the Mitigated Negative Declaration that was recommended for this project and the Conditional Use Permit to be approved with the Findings listed in the Staff Report and the Mitigation Measures and Conditions of Approval as attached. .

Obermeyer explained that there is a ten day appeal period if anyone wants to appeal the decision of the Planning Commission.

IV. PUBLIC COMMENT:

The Public Comment Period was opened.

There were no public comments.

The Public Comment Period was closed.

V. DISCUSSION:

The Discussion Period was opened.

Obermeyer addresses Planning Commission with a few items: (1) Brett Walker has taken a job with Butte County and his position is in the process of being filled (2) Next Planning Commission meeting to be held on January 16, 2008.

The Discussion Period was closed.

The December 19, 2007 Planning Commission meeting was adjourned.

Respectfully submitted,

DRAFT

Appendix C
Form 200

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

I. FACILITY INFORMATION

A. FACILITY:

Name: Douglas Freitas dba Mission Livestock

Address: 6569 County Road 27 Mailing Address: P.O. Box 933 Dixon, CA 95620

City/County/State/Zip Code: Orland, CA 95963

Contact Person: Douglas Freitas

Telephone Number: (510) 996-8455 Email: freitas.douglas.p@gmail.com

B. FACILITY OWNER:

Name: Paul Violich Rev Trust/ Violich Farms Inc./Alcatraz Farming, Inc.

Address: P.O. Box 875

City/State/Zip Code: Kentfield, CA 94914

Contact Person: Julia Violich

Telephone Number: (415)308-1589 Email: jviolich@capayfarms.com

Federal Tax ID: 94-241-2203

Owner Type (*Mark one*):

☐ Individual ☑ Corporation ☐ Governmental Agency ☐ Partnership

☑ Other: Corporation and Trust

C. FACILITY OPERATOR (The agency or business, not the person):

Name: Mission Livestock

Address: 6569 County Road 27 Mailing Address: P.O. Box 933 Dixon, CA 95620

City/State/Zip Code: Orland, CA 95963

Contact Person: Douglas Freitas

Telephone Number: (510)996-8455 Email: freitas.douglas.p@gmail.com

Operator Type (*Mark one*):

☐ Individual ☑ Corporation ☐ Governmental Agency ☐ Partnership

☐ Other:

D. OWNER OF THE LAND

Name Same as Facility Owner

Address

City/State/Zip Code

Contact Person

Telephone Number Email

Owner Type (*Mark one*):

☐ Individual ☑ Corporation ☐ Governmental Agency ☐ Partnership

☑ Other:

E. ADDRESS WHERE LEGAL NOTICE MAY BE SERVED

Address 156 Ridgewood Road

City/State/Zip Code Kentfield, CA 94904

Contact Person Julia Violich

Telephone Number (415) 308-1589 Email jviolich@capayfarms.com

F. BILLING ADDRESS

Address P.O. Box 875

City/State/Zip Code Kentfield, CA 94904

Contact Person Julia Violich

Telephone Number (415) 308-1589 Email jviolich@capayfarms.com

II. <u>TYPE OF DISCHARGE</u>

Check Type of Discharge(s) Described in this Application:

☑ **Waste Discharge to Land** ☐ **Waste Discharge to Surface Water**

Check all that apply:

☑ Animal or Aquacultural Wastewater
☑ Animal Waste Solids
☐ Biosolids/Residual
☐ Cooling Water
☐ Domestic/ Municipal Wastewater Treatment and Disposal
☐ Dredge Material Disposal
☐ Hazardous Waste (*see instructions*)
☐ Industrial Process Wastewater
☐ Land Treatment Unit
☐ Landfill (*see instructions*)
☐ Mining
☐ Storm Water
☐ Surface Impoundment
☐ Waste Pile
☐ Wastewater Reclamation
☑ Other, *please describe* Feedlot

III. LOCATION OF THE FACILITY

Describe the physical location of the facility:

1. Assessor's Parcel Number(s)
   - Facility: Portion of 024-100-017-0
   - Discharge Point: See Figure 1 attached
2. Latitude
   - Facility: 39°40'42.63"N
   - Discharge Point: N/A
3. Longitude
   - Facility: 122°11'26.43"W
   - Discharge Point: N/A

IV. REASON FOR FILING

Check all that apply:

- ☐ New Discharge or Facility
- ☑ Change in Design or Operation
- ☐ Change in Quantity/Type of Discharge
- ☑ Changes in Ownership/Operator (see instructions)
- ☐ Waste Discharge Requirements Update or NPDES Permit Reissuance
- ☑ Other: Greenwood Dairy is closing and new feedlot is taking over the facility.

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Name of Lead Agency Glenn County

Has a public agency determined that the proposed project is exempt from CEQA?

☐ Yes ☑ No

If yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below:

_____

_____

Has a "Notice of Determination" been filed under CEQA?

☐ Yes ☑ No

If Yes, enclose a copy of the CEQA document, Environmental Impact Report (EIR), or Negative Declaration. If No, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents: ☐ EIR ☐ Negative Declaration

Expected CEQA Completion Date: _____

VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

II Type of Discharge section- The feedlot facility will be composting. There will NOT be any land application.

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name Douglas Freitas Title Operator of Mission Livestock

Signature DocuSigned by: 543DE24DA83D436... Date 4/1/2020

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:

DRAFT

Appendix D

Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Glenn County, California

Mission Livestock

March 10, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:9,480 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

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

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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Glenn County, California
Survey Area Data: Version 15, Sep 16, 2019

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

Date(s) aerial images were photographed: Mar 30, 2017—Nov 4, 2017

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 (Mission Livestock)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Czr	Cortina very gravelly sandy loam, 0 to 3 percent slopes	91.7	65.6%
Tg	Tehama gravelly loam, 0 to 3 percent slopes, MLRA 17	3.7	2.7%
Tm	Tehama silt loam, 0 to 3 percent slopes, MLRA 17	44.3	31.7%
Totals for Area of Interest		**139.8**	**100.0%**

Map Unit Descriptions (Mission Livestock)

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, 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*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one 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.

Glenn County, California

Czr—Cortina very gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hd7h
Elevation: 30 to 2,400 feet
Mean annual precipitation: 8 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cortina

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium

Typical profile

H1 - 0 to 8 inches: very gravelly sandy loam
H2 - 8 to 40 inches: stratified very gravelly loamy sand to very gravelly loam
H3 - 40 to 60 inches: stratified very gravelly sand to very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: About 40 inches to strongly contrasting textural stratification
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Gravel pits
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 5 percent
Landform: Fans
Hydric soil rating: Yes

Tg—Tehama gravelly loam, 0 to 3 percent slopes, MLRA 17

Map Unit Setting
National map unit symbol: 2srjb
Elevation: 100 to 1,970 feet
Mean annual precipitation: 17 to 43 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Prime farmland if irrigated

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

Description of Tehama

Setting
Landform: Stream terraces, stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium derived from metamorphic and sedimentary rock

Typical profile
Ap - 0 to 9 inches: gravelly loam
Bt - 9 to 27 inches: gravelly clay loam
BCtk - 27 to 60 inches: gravelly clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 1.28 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillgate

Percent of map unit: 5 percent
Hydric soil rating: No

Arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Plaza

Percent of map unit: 5 percent
Hydric soil rating: No

Tm—Tehama silt loam, 0 to 3 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2srj8
Elevation: 100 to 1,180 feet
Mean annual precipitation: 17 to 21 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Tehama

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium derived from metamorphic and sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
BAt - 9 to 12 inches: silty clay loam

Bt1 - 12 to 19 inches: silty clay loam
Bt2 - 19 to 27 inches: silty clay loam
BCtk1 - 27 to 38 inches: silty clay loam
BCtk2 - 38 to 50 inches: silty clay loam
BCtk3 - 50 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Hillgate

Percent of map unit: 5 percent
Hydric soil rating: No

Plaza

Percent of map unit: 5 percent
Hydric soil rating: No

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Appendix E

Water Balance

Mission **1.5 * Average Precipitation Year**
Mar-20

Precip — Orland - from WRCC, 2020
ET — Durham - from CIMIS, 2020

Notes:
1 - No note 1
2 - Compost Area = 3.0 acres. Application rate = 0.0921 aft/acre/month * compost area) March through October
3 - Freeboard Calculation

24 hour/25 year design storm	3.89 inches	From NOAA
Total pond surface area	25 acres	From below Input
Runnoff area	50.5 acres	From below Input
Runoff factor	0.4	From below Input
Minimum Required Freeboard Estimate	**0.59 feet**	**Calculated - Use this Number for Required Freeboard on Line 33**

4- Monthly water application to compost is 10,000 gallons per month per acre of compost = 0.0307 acre-feet per acre of compost per month, excluding Oct thru Feb.

Compost Water Usage	0.0000	acre-feet/acre/month	Enter 0.0306 if water is being reapplied to compost. If not, enter 0.
Fraction Runoff Area w/Compost	1.00		

Mission **1.5 * Average Precipitation Year**
0.00 End of Sept. Pond Balance (aft)

Note: 30,000 gallons per day over 20 acres = 30,000 gallons per month/acre (assuming you apply water 20 days per month)

gal/month/acre	aft/acre/month		aft/month (20 acres)	
10,000	0.0307			
15,000	**0.0460**		**0.92**	**October, November and December**
30,000	**0.0921**	**Garys Estimate**	**1.84**	
33,000	0.1013	10 percent more		
36,000	0.1105	20 percent more		
37,500	**0.1151**	**25 percent more**	**2.30**	**March through September**
39,000	0.1197	30 percent more		
45,000	0.1381	50 percent more	2.76	

Same as gal/day over 20 acres assuming 20 days per month

PW=generic

Input

Total Pond Surf. Area	25	Acres	From pond design sheets. Used for direct precipitation into ponds
Avg. Pond Surf. Area	20	Acres	From pond design sheets. Used for evaporation and infiltration from ponds [(total pond surface area + total pond bottom surface area) / 2]
Runoff Area	50.5	Acres	From site plan. Includes berms that drain into the ponds.
Runoff Factor	0.4	Fraction	Composite value for runoff areas based on 2016 WMP Update = 0.325 (0.4 used to be conservative).
Precip Factor	1.5	Fraction	Per regulation.
Evap Factor	1.1	Fraction	See Terms below - Monthly Evap (use 1 if primary loss is from irrigation, adjust upward if primary loss is from ponds). Eto < Pond Loss < Pan.
Irrigated Area	0	Acres	Water is not being land-applied.
Required Freeboard	0.59	Feet	Based on 24 hour/25 year design storm. Additional 2-feet of freeboardis not included here because calculated Maximum Required Storage Volume is compared to Available Storage Volume, which does not incude freeboard.
Potential Infiltration Rate	0.0014	In/hour	Use 0 to be conservative. 10-6 cm/sec = 0.0014 inches/hour. 10-6 used because ponds were designed to NRCS standard.

Dilution Factor (see Notes) 1

Calcs

Month	Average Monthly Precip. (inches)	Adjusted Monthly Precip. (inches)	Monthly Evap (see Terms) (inches)	Adjusted Evap. (inches)	Beginning Water Volume (aft)	Monthly Precip. In (aft)	Monthly Runoff In (aft)	Monthly Process In (aft)	Monthly Total In (aft)	Potential Monthly Pond Infiltr. Out (aft)	Potential Monthly Pond Evap. Out (aft)	Monthly Irrigation Out (aft)	Monthly Treatment Out (aft)	Monthly Compost Out (aft)	Total Potential Monthly Out (aft)	End of Month Balance (aft)	Freeboard or Design Storm Volume (aft)	Required Pond Storage (aft)	Monthly Discharge Rate For Discharge or Treatment: Monthly Accumulation (aft)	Monthly Discharge Rate For Discharge or Treatment: Equivalent Monthly Discharge (gpm)
10	1.05	1.58	3.33	3.66	0.00	3.28	2.65	0.00	5.93	1.68	6.11	0.00	0.00	0.28	8.07	0.00	14.75	14.75	0	0
11	2.32	3.48	1.63	1.79	0.00	7.25	5.86	0.00	13.11	1.68	2.99	0.00	0.00	0.00	4.67	8.44	14.75	23.19	8.44	65
12	3.52	5.28	1.05	1.16	8.44	11.00	8.89	0.00	19.89	1.68	1.93	0.00	0.00	0.00	3.61	24.72	14.75	39.47	16.28	125
1	4.04	6.06	1.21	1.33	24.72	12.63	10.20	0.00	22.83	1.68	2.22	0.00	0.00	0.00	3.90	43.65	14.75	58.40	18.93	146
2	3.43	5.15	1.95	2.15	43.65	10.72	8.66	0.00	19.38	1.68	3.58	0.00	0.00	0.00	5.26	57.77	14.75	72.52	14.12	109
3	2.66	3.99	3.4	3.74	57.77	8.31	6.72	0.00	15.03	1.68	6.23	0.00	0.00	0.28	8.19	64.61	14.75	79.36	6.84	53
4	1.3	1.95	4.89	5.38	64.61	4.06	3.28	0.00	7.35	1.68	8.97	0.00	0.00	0.28	10.93	61.03	14.75	75.78	0.00	0
5	0.73	1.10	6.58	7.24	61.03	2.28	1.84	0.00	4.12	1.68	12.06	0.00	0.00	0.28	14.02	51.13	14.75	65.88	0.00	0
6	0.37	0.56	7.35	8.09	51.13	1.16	0.93	0.00	2.09	1.68	13.48	0.00	0.00	0.28	15.44	37.79	14.75	52.54	0.00	0
7	0.04	0.06	7.54	8.29	37.79	0.13	0.10	0.00	0.23	1.68	13.82	0.00	0.00	0.28	15.78	22.23	14.75	36.98	0.00	0
8	0.11	0.17	6.61	7.27	22.23	0.34	0.28	0.00	0.62	1.68	12.12	0.00	0.00	0.28	14.08	8.77	14.75	23.52	0.00	0
9	0.37	0.56	4.92	5.41	8.77	1.16	0.93	0.00	2.09	1.68	9.02	0.00	0.00	0.28	10.98	0.00	14.75	14.75	0.00	0
Annual	**19.94**	**29.91**	**50.46**	**55.51**		**62.31**	**50.35**		**112.66**											

0.00	Adjust pond size or irrigated acres until this number = 0
79.36	Maximum Required Storage Capacity (aft)
3.97	Approximate Pond Depth (Maximum Storage/Average Pond Surface Area)
3,456,943	Maximum required storage capacity (cft)

Terms

Average Monthly Precip. - Take from WRRC web site
Monthly Evap. - If irrigating, enter Eto from nearest CIMIS station here and an Evap Factor (if necessary) to estimate pond evap (Adjusted Evap). If not irrigating, you can enter pan/pond directly and use1 for Evap Factor.
Adjusted Evap. - Adjusted to get pan/pond evaporation
Beginning Water Volume - Assume volume is 0 on October 1 (ie, you want to end up with zero at end of month 9)
Monthly Runoff In - Calculated for runoff area specified and runoff factor.
Monthly Process In - Enter monthly values manually
Monthly Total In - Sum of monthly runoff plus monthly process plus monthly precipitation, actual value
Monthly Pond Infiltriltration Out - Calculated from infiltration rate entered (if you want to be conservative, use 0). Infiltration is the potential rate assuming water is present.
Monthly Pond Evaportation Out, potential value
Monthly Irrigation Out - Water out for irrigation etc (set up to be based on adjusted pan evap rate and irrigated acres), potential value, zero if precip > Eto
Monthly Total Out - Sum of monthly infiltration, monthly evaporation and irrigation out, potential value.
EOM Balance - Beginning monthly water volume plus Actual Monthly Total In minus Potential Monthly Total Out, Zero if negative


Mission Livestock
Runoff Area
51.9 acres
+ 3.3 acres
- 11.7 acres (covered areas)
+ 7 acres (pond berms)
= 50.5 acres
Note: Pond berm area from design drawings
DRAFT
0.35 Acres
51.9 Acres
3.3 Acres
27
5
Google Earth
© 2020 Google
N
1000 ft

DRAFT

Appendix F

Historical Groundwater Data

Appendix B-1
MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-1	1/14/03	7	580	--	--	250	<0.1	22.4	31	48	380	< 1	--	--	--	--	--	36	37	--	--	22	--
	12/10/03	6.9	590	--	--	226	<0.1	30.2	--	52.8	360	< 1	--	--	--	--	--	40	37	--	--	22	--
	1/6/05	7	570	--	--	268	<0.1	23.1	--	43.2	330	< 1	<0.02	--	--	--	--	32	32	--	--	23	<0.02
	8/2/05	6.9	559	209	<2	255	<0.1	24	7	37.1	373	1.6	<0.02	<0.02	<2	<2	110	49	64	2.25	12	12	<0.02
	9/21/06	6.9	558	203	<5	248	<5	24.8	8.91	43.1	393	2.7	0.15	5.24	17	17	153	50	45	3.91	2	24	0.16
	5/31/07	7.20	494	220	<5.0	268	<0.10	20	6.5	36	410	3.6	<0.2	2.6	<2	<2	410	93	100	8.8	8.5	26	<0.2
	12/28/07	7.76	590	203	<1	247	<1	20.4	7.23	37.8	--	--	0.32	--	--	--	--	63	69	--	4	27	0.34
	5/28/08	6.81	461	213	<1	260	<1	20	6.26	38	--	--	2.2	--	--	--	--	68	91	--	17	29	2.33
	12/2/08	6.23	563	280	<1	342	<1	15.9	10.3	32	450	--	0.8	87.8	--	--	--	247	419	--	45	36	0.85
	5/29/09	6.96	676										DRY										
	11/24/09												DRY										
	5/12/10	6.94	466	--	--	--	--	--	7.18	--	420	--	0.27	3.46	--	<2	--	--	--	--	5.3	--	0.35
	12/13/10	7.07	415	210	<1	256	<1	18.8	7.10	35.3	422	--	0.05	3.64	--	<2	--	53	64	--	6.4	26	0.05
	6/9/11	6.64	502	--	--	--	--	--	7.14	--	360	--	0.053	4.12	--	<2	--	--	--	--	6.2	--	0.053
	12/2/11	6.88	523	207	<1	252	<1	19.5	6.71	34.8	443	--	<0.02	2.62	--	<2	--	57	70	--	6.3	24	<0.02
	5/16/12												DRY										
	12/11/12												DRY										
	5/7/13												DRY										
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/20/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.78	642	--	--	--	--	--	9.23	--	424	--	<0.05	2.32	--	<2	--	--	--	--	16.8	--	<0.06
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	7.10	493	--	--	--	--	--	8.51	--	444	--	<0.02	1.47	--	<2	--	--	--	--	13.2	--	<0.0257
	12/17/19	7.60	560	197	<2	240	<2	25.9	9.32	31.8	390	--	<0.02	0.278	--	2	--	42.4	72.2	--	12.0	--	<0.0257
MW-2	1/14/03	7	570	--	--	250	<0.1	24	31	42.2	370	< 1	--	--	--	--	--	38	34	--	--	19	--
	12/10/03	6.9	550	--	--	226	<0.1	31.2	--	41.3	320	< 1	--	--	--	--	--	40	28	--	--	19	--
	1/6/05	7	550	--	--	256	<0.1	24	--	41	330	< 1	<0.02	--	--	--	--	32	20	--	--	20	<0.2
	8/2/05	6.8	499	195	<2	237	<0.1	18.4	<2	31.4	313	2.8	0.03	0.07	<2	<2	250	66	66	3.75	2	16	<0.02
	9/21/06	6.9	489	196	<5	240	<5	20.1	6.47	31.8	327	1.6	0.2	2.7	<2	<2	91.2	44	39	1.72	2	20	0.21
	5/31/07	7.06	498	220	<1	264	<1.0	20	7.1	34	410	2	<0.2	2.6	<2	<2	240	68	110	4.3	6	22	<0.2
	12/28/07	7.21	561	247	<1	247	<1	20.4	7.23	37.8	--	--	0.3	--	--	--	--	92	112	--	6	26	0.32
	5/28/08	6.74	475	220	<1	268	<1	21.7	6.26	38	--	--	0.015	--	--	--	--	76	110	--	22	26	0.043
	12/2/08												DRY										
	5/29/09	7.04	708	--	--	--	--	--	5.30	--	625	--	0.09	6.49	--	<2	--	--	--	--	8	--	0.06
	11/24/09												DRY										
	5/12/10	6.72	816	--	--	--	--	--	6.30	--	657	--	<0.15	2.07	--	<2	--	--	--	--	5.2	--	<0.16
	12/13/10	6.88	677	425	<1	519	<1	56	5.14	31.1	612	--	0.05	6.69	--	<2	--	122	169	--	14.2	31	0.05
	6/9/11	6.37	595	--	--	--	--	--	6.99	--	400	--	0.05	2.06	--	<2	--	--	--	--	5.6	--	0.053
	12/13/11	6.70	838	313	<1	382	<1	33.8	7.47	32.2	483	--	0.04	0.38	--	<2	--	61	55	--	3.4	25	0.047
	5/16/12	6.90	828	--	--	--	--	--	5.05	--	490	--	<0.03	0.42	--	4	--	--	--	--	6.8	--	<0.03

Appendix B-1
MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-2	12/11/12												DRY										
	5/7/13	6.62	1,092	--	--	--	--	--	2.64	--	792	--	0.11	0.52	--	2	--	--	--	--	5.1	--	0.15
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/16	6.62	1,499	--	--	--	--	--	8.17	--	937	--	<0.05	0.96	--	<2	--	--	--	--	10.9	--	<0.06
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	6.92	1,334	--	--	--	--	--	15.8	--	855	--	<0.02	1.34	--	<2	--	--	--	--	10.9	--	<0.0257
	12/17/19												DRY										
MW-3	1/14/03	7	1,200	--	--	732	<0.1	64	<2	33.1	660	0.5	--	--	--	--	--	76	94	--	--	37	--
	12/19/03	6.8	1,150	--	--	610	<0.1	67.3	--	18.2	640	4.3	--	--	--	--	--	70	110	--	--	35	--
	1/6/05	6.8	1,030	--	--	610	<0.1	53.3	--	46.1	560	2.8	1.3	--	--	--	--	52	59	--	--	33	1.38
	8/2/05	6.5	1,193	565	<10	690	<0.1	72.3	< 2	28.1	668	9.6	5.16	<0.02	<2	<2	31	78	94	3.22	11	32	7.58
	9/21/06	6.8	1,290	671	<5	819	<5	82.4	0.04	17.6	794	9.8	3.99	2.08	>1,600	>1,600	8.21	89	111	3.99	19	44	4.12
	5/31/07	6.65	3,610	730	<1	841	<1.0	880	<1.5	55	2200	4	4.2	3.9	17	<2	130	310	250	11	34	450	4.45
	12/28/07	6.78	595	580	<1	265	<	422	3.3	84.3	--	--	5.23	--	--	--	--	127	161	--	23	178	3.42
	5/28/08	6.71	1,348	722	<1	881	<	142	0.43	21.2	--	--	--	--	--	--	--	106	129	--	24	64	--
	12/2/08	7.04	2,044	1,500	<1	1,830	<1	138	0.1	4.90	2,170	--	40.1	16.4	--	--	--	200	225	--	102	104	48.8
	5/29/09	7.35	2,254	--	--	--	--	--	0.07	--	2,800	--	20.2	5.34	--	13	--	--	--	--	48	--	21.4
	11/24/09												DRY										
	5/12/10	6.77	1,947	--	--	--	--	--	<0.01	--	1,390	--	19.6	--	--	500	--	--	--	--	63.6	--	25.2
	12/13/10	6.96	1,493	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/9/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	1/14/03	7.1	500	--	--	275	<0.1	31.2	25	30.2	340	<1	--	--	--	--	--	60	23	--	--	23	--
	12/19/03	7	650	--	--	268	<0.1	27.3	--	37.9	380	<1	--	--	--	--	--	68	26	--	--	25	--
	1/6/05	7	670	--	--	317	<0.1	30.9	--	39.4	380	<1	<0.02	--	--	--	--	56	22	--	--	32	<0.02
	8/2/05	7	723	256	<2	312	<0.1	36.2	13	39.1	469	<1	0.06	0.03	<2	<2	33.2	78	34	0.514	4	27	0.06
	9/21/06	7	671	261	<5	319	<5	38.5	11.8	47.8	459	0.1	0.08	0.98	7	<2	30.9	81	30	0.52	2	32	0.08
	5/31/07	7.19	544	12	<1	77	<1.0	25	6.9	36	400	<1.0	<0.2	3.9	<2	<2	97	250	95	4	<40	32	<0.2
	12/28/07	7.94	604	209	<1	255	<1	26.4	7.98	39.8	--	--	0.37	--	--	--	--	92	56	--	4	32	0.37
	5/28/08	6.87	560	245	<1	298	<1	29.8	9.3	43.1	--	--	0.05	--	--	--	--	96	70	--	15	34	0.05
	12/2/08												DRY										
	5/29/09	7.45	653	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/24/09												DRY										
	5/12/10	6.85	677	--	--	--	--	--	15.3	--	527	--	<0.15	0.80	--	2	--	--	--	--	5.3	--	<0.10
	12/13/10	6.83	532	276	<1	337	<1	34.2	8.66	43.1	484	--	<0.15	26.0	--	50	--	118	81	--	8.3	32	<0.16
	6/9/11	6.48	750	--	--	--	--	--	8.45	--	496	--	0.043	1.11	--	<2	--	--	--	--	4.0	--	0.043
	12/2/11	6.81	714	322	<1	392	<1	36.0	3.81	41.3	487	--	0.06	0.71	--	2	--	94	42	--	3.3	28	0.06
	5/16/12												DRY										
	12/11/12												DRY										
	5/7/13												DRY										
	12/10/13												DRY										

Appendix B-1
MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-4	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.53	1,043	--	--	--	--	--	16.8	--	666	--	<0.05	1.01	--	<2	--	--	--	--	18.7	--	<0.06
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	6.91	916	--	--	--	--	--	11.1	--	640	--	<0.02	6.05	--	30	--	--	--	--	11.7	--	<0.0257
	12/17/19												DRY										
MW-5	1/14/03	7	670	--	--	305	<0.1	31.2	34	43.7	370	< 1	--	--	--	--	--	42	39	--	--	39	--
	12/19/03	6.9	740	--	--	293	<0.1	39.1	--	52.8	390	< 1	--	--	--	--	--	46	43	--	--	39	--
	1/6/05	7	670	--	--	311	<0.1	32	--	47.5	400	< 1	<0.02	--	--	--	--	40	37	--	--	41	<0.02
	8/2/05	6.8	704	257	<2	313	<0.1	37.7	8	45.6	484	1.4	<0.02	<0.02	<2	<2	91.6	58	69	1.99	14	34	<0.02
	9/21/06	7	740	287	<5	351	<5	41.3	9.12	47.4	437	0.7	0.12	0.04	<2	<2	33.8	54	50	0.643	4	36	0.13
	5/31/07	7.90	554	260	<5	339	<1.0	27	6.4	36	410	<1.0	<0.2	2.7	<2								
	12/28/07	7.87	567	236	<1	288	<1	25.8	6.48	39.2	--	--	0.49	--	--	--	--	60	55	--	4	32	0.52
	5/28/08	6.79	502	206	<1	293	<1	24	6.42	35.9	--	--	0.08	--	--	--	--	67	69	--	15	32	0.08
	12/2/08	7.19	515	134	<1	164	<1	22.3	6.09	34.6	410	--	0.05	0.55	--	--	--	52	44	--	5	27	0.05
	5/29/09	7.17	576	--	--	--	--	--	3.13	--	391	--	0.04	0.48	--	<2	--	--	--	--	5	--	0.04
	11/24/09	7.09	570	241	<1	294	<1	22.3	5.36	35.9	300	--	0.241	2.88	--	<2	--	61	58	--	7	28	0.271
	5/12/10	6.82	560	--	--	--	--	--	10.7	--	487	--	0.06	4.72	--	<2	--	--	--	--	5.1	--	0.07
	12/13/10	6.89	473	244	<1	298	<1	27.6	7.78	35.7	454	--	0.033	0.89	--	6	--	50	46	--	4.11	32	0.034
	6/9/11	6.40	619	--	--	--	--	--	7.26	--	401	--	0.043	1.07	--	<2	--	--	--	--	4.0	--	0.041
	12/2/11	6.66	678	277	<1	338	<1	30.6	7.04	38.8	433	--	0.031	0.30	--	<2	--	52	46	--	3.2	33	0.037
	5/16/12	6.97	1,031	--	--	--	--	--	2.39	--	--	--	<0.03	0.12	--	<2	--	--	--	--	3.2	--	<0.03
	12/11/12	6.75	807	293	<1	358	<1	29.3	5.09	33.1	406	--	0.05	0.10	--	<2	--	54	40	--	2.5	32	0.05
	5/7/13	6.75	1,190	--	--	--	--	--	3.80	--	811	--	0.481	1.71	--	30	--	--	--	--	4.4	--	0.62
	12/10/13	6.76	564	244	<1	298	<1	28.5	6.26	36.2	384	--	<0.03	0.09	--	<2	--	49	56	--	2.2	28	<0.03
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16	6.82	1,142	584	<1	713	<1	68.4	<0.02	38.6	820	--	0.13	2.35	--	>1,600	--	104	81.1	--	5.6	58.3	--
	12/7/16	6.80	751	349	<1	426	<1	37.8	0.041	36.0	439	--	0.17	0.26	--	<2	--	58.3	44.9	--	4.4	39.2	0.22
	5/24/17	6.58	1,118	--	--	--	--	--	15.0	--	612	--	0.18	0.23	--	<2	--	--	--	--	6.0	--	0.23
	12/18/17	6.5	1,068	523	<2	638	<2	51.1	0.08	42.7	680	--	1.83	0.89	--	2	--	99.5	75.6	--	19.6	58.9	2.35
	5/31/18	6.91	1,677	--	--	--	--	--	<0.02	--	1,040	--	3.04	1.55	--	900	--	--	--	--	17.7	--	3.90
	12/13/18												DRY										
	5/30/19	7.07	916	--	--	--	--	--	12.0	--	567	--	0.560	0.824	--	<2	--	--	--	--	8.2	--	0.720
	12/17/19	7.44	880	290	<2	364	<2	55.7	14.3	36.7	561	--	<0.02	1.08	--	4	--	67.4	60.9	--	6.1	38.1	<0.0257
MW-6	12/28/07	7.55	507	193	<1	235	<1	20	6.46	38.2	--	--	0.59	--	--	--	--	56	67	--	4	23	0.62
	5/28/08	6.87	444	206	<1	251	<1	19.8	6.39	19.8	--	--	0.05	--	--	--	--	58	73	--	14	24	0.05
	12/2/08												DRY										
	5/29/09	7.21	544	--	--	--	--	--	5.66	--	282	--	0.07	1.07	--	2	--	--	--	--	5	--	0.07

Appendix B-1
MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-6	11/24/09												DRY										
	5/12/10	7.10	477	--	--	--	--	--	6.99	--	375	--	0.20	3.42	--	<2	--	--	--	--	4.4	--	0.26
	12/13/10	6.96	408	200	<1	255	<1	17.9	6.71	33.3	383	--	0.05	3.22	--	7	--	58	72	--	6.7	24	0.05
	6/9/11	6.50	484	--	--	--	--	--	6.67	--	354	--	0.043	3.52	--	<2	--	--	--	--	4.4	--	0.043
	12/13/11	6.96	587	198	<1	241	<1	18.4	7.05	30.5	325	--	0.05	0.18	--	<2	--	47	40	--	3.5	21	0.05
	5/16/12	7.16	521	--	--	--	--	--	6.81	--	337	--	0.05	0.48	--	<2	--	--	--	--	5.1	--	0.05
	12/11/12												DRY										
	5/7/13	6.76	516	--	--	--	--	--	7.58	--	407	--	<0.30	0.98	--	<2	--	--	--	--	3.8	--	<0.30
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.37	679	--	--	--	--	--	8.37	--	453	--	<0.05	0.97	--	<2	--	--	--	--	11.6	--	<0.06
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	7.05	622	--	--	--	--	--	12.4	--	489	--	<0.02	1.82	--	<2	--	--	--	--	11.1	--	<0.0257
	12/17/19	7.25	534	201	<2	245	<2	20.9	7.99	28.3	382	--	<0.02	1.39	--	<2	--	52.5	64.0	--	12.7	21.6	<0.0257
MW-8	5/28/08	6.93	561	272	<1	331	<1	31.8	6.82	35.1	--	--	0.14	--	--	--	--	81	94	--	15	27	0.13
	12/2/08												DRY										
	5/29/09	7.44	703										DRY										
	11/24/09												DRY										
	5/12/10	7.13	626	--	--	--	--	--	6.35	--	487	--	<0.15	0.05	--	<2	--	--	--	--	6.2	--	<0.19
	12/13/10	6.97	567	353	<1	431	<1	34.4	6.08	34.9	428	--	0.06	1.38	--	<2	--	80	72	--	5.7	27	0.06
	6/9/11	6.43	828	--	--	--	--	--	6.56	--	552	--	0.05	0.73	--	<2	--	--	--	--	4.4	--	0.051
	12/13/11	6.82	762	285	<1	347	<1	25.6	6.62	31.9	438	--	0.043	0.22	--	<2	--	58	44	--	3.8	22	0.043
	5/16/12	6.96	678	--	--	--	--	--	7.10	--	432	--	0.05	0.34	--	<2	--	--	--	--	5.8	--	0.05
	12/11/12												DRY										
	5/7/13	6.79	695	--	--	--	--	--	7.66	--	407	--	<0.3	0.84	--	<2	--	--	--	--	5.6	--	<0.30
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.74	1,062	--	--	--	--	--	6.81	--	630	--	<0.05	3.40	--	<2	--	--	--	--	22.1	--	<0.06
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19												DRY										
	12/17/19												DRY										
MW-9	5/28/08	7	479	220	<1	268	<1	23.3	6.77	37	--	--	0.043	--	--	--	--	77	100	--	18	26	0.043
	12/2/08	7.82	524	244	<1	297	<1	21.8	5.88	35.5	405	--	0.42	19	--	--	--	315	634	--	74	30	0.44
	5/29/09	7.14	730	--	--	--	--	--	1.42	--	479	--	0.08	0.91	--	<2	--	--	--	--	5	--	0.08

Appendix B-I

MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-9	11/24/09																						
	5/12/10	7.31	669	--	--	--	--	--	5.61	--	524	--	DRY										
	12/13/10	7.16	534	329	<1	402	<1	27.9	5.02	32.8	455	--	0.25	3.05	--	<2	--	--	--	--	4.3	--	0.32
	6/9/11	6.65	692	--	--	--	--	--	6.02	--	461	--	0.044	0.75	--	<2	--	78	55	--	3.85	27	0.014
	12/13/11	6.87	791	307	<1	374	<1	26.0	5.94	31.6	484	--	0.043	1.00	--	<2	--	--	--	--	2.8	--	0.043
	5/16/12	6.92	668	--	--	--	--	--	6.35	--	434	--	0.043	0.67	--	<2	--	91	100	--	8.7	26	0.044
	12/11/12												0.05	0.65	--	<2	--	--	--	--	2.9	--	0.05
	5/7/13	6.71	676	--	--	--	--	--	7.47	--	477	--	DRY										
	12/10/13												<0.3	1.14	--	<2	--	--	--	--	3.5	--	<0.30
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	7.08	914	--	--	--	--	--	6.41	--	587	--	DRY										
	12/18/17	6.9	818	384	<2	469	<2	30.0	6.95	32.5	578	--	<0.05	0.86	--	<2	--	--	--	--	10.1	--	<0.05
	5/31/18												<0.05	1.87	--	<2	--	265	431	--	38.5	34.1	<0.05
	12/13/18												DRY										
	5/30/19	7.28	886	--	--	--	--	--	6.71	--	592	--	DRY										
	12/17/19	7.44	852	379	<2	462	<2	32.2	6.83	31.2	563	--	0.032	0.561	--	<2	--	--	--	--	5.0	--	<0.0257
MW-10	5/28/08	6.97	464	208	<1	254	<1	20	11.0	33.2	--	--	0.02	0.960	--	<2	--	102	79.0	--	9.2	26.9	<0.0257
	12/2/08												0.07		--	--	--	68	90	--	18	26	0.07
	5/29/09	7.86	332	--	--	--	--	--	--	--	--	--	DRY										
	11/24/09												--	--	--	--	--	--	--	--	--	--	--
	5/12/10	7.00	351	--	--	--	--	--	10.8	--	311	--	DRY										
	12/13/10	6.91	335	158	<1	193	<1	5.84	5.73	15.0	308	--	0.26	6.04	--	4	--	--	--	--	17.6	--	0.33
	6/9/11	6.61	480	--	--	--	--	--	11.3	--	361	--	<0.15	3.77	--	300	--	76	121	--	15.9	17	<0.76
	12/13/11	6.87	517	165	<1	202	<1	10.2	13.8	15.8	359	--	0.23	6.22	--	1,600	--	--	--	--	18.3	--	0.23
	5/16/12												0.16	1.54	--	30	--	60	120	--	22.7	17	0.17
	12/11/12												DRY										
	5/7/13												DRY										
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/29/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.79	333	--	--	--	--	--	10.1	--	334	--	DRY										
	12/18/17												<0.47	10.3	--	17	--	--	--	--	9.01	--	0.22
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	6.95	667	--	--	--	--	--	16.4	--	504	--	DRY										
	12/17/19												1.35	25.9	--	980	--	--	--	--	75.2	--	1.74
MW-11	5/28/08	6.56	910	463	<1	565	<1	86.2	2.67	86.2	--	--	DRY										
	12/2/08												0.13	--	--	--	--	94	133	--	22	45	0.14
	5/29/09	7.17	1,118	--	--	--	--	--	5.6	--	733	--	DRY										
													0.44	11.7	--	<2	--	--	--	--	35	--	0.47

Appendix B-1
MONITORING WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	pH (units)	EC (umhos/cm)	Alk. (mg/l)	OH (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	TKN (mg/l)	NH3-N (mg/l)	Total P (mg/l)	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)	Fe (mg/l)	Ca (mg/l)	Mg (mg/l)	Mn (mg/l)	K (mg/l)	Na (mg/l)	NH4 (mg/l)
MW-11	11/24/09												DRY										
	5/12/10	6.61	1,007	--	--	--	--	--	30.0	--	782	--	0.06	0.51	--	<2	--	--	--	--	10.2	--	0.06
	12/13/10	6.75	828	469	<1	573	<1	70.2	18.7	44.9	762	--	<0.15	3.34	--	4	--	90	101	--	6.6	43	<0.15
	6/9/11	6.39	985	--	--	--	--	--	16.7	--	710	--	0.06	0.31	--	17	--	--	--	--	9.3	--	0.06
	12/13/11	6.61	1,362	435	<1	530	<1	47.3	37.6	41.3	733	--	0.06	0.18	--	2	--	85	96	--	4.8	39	0.06
	6/12/12	6.42	948	--	--	--	--	--		--	1,070	--	2.45	1.73	--	7	--	--	--	--	15.2	--	2.59
	12/11/12												DRY										
	5/7/13	6.77	1,725	--	--	--	--	--	0.45	--	1,090	--	5.02	3.00	--	30	--	--	--	--	19.0	--	6.45
	12/10/13												DRY										
	5/21/14												DRY										
	12/22/14												DRY										
	5/20/15												DRY										
	12/17/15												DRY										
	6/7/16												DRY										
	12/7/16												DRY										
	5/24/17	6.62	1,381						11.0		784		1.09	3.6		13					21.7		1.28
	12/18/17												DRY										
	5/31/18												DRY										
	12/13/18												DRY										
	5/30/19	7.25	974						41.1	--	687		<0.02	0.408	--	300	--	--	--	--	5.1	--	<0.0257
	12/17/19												DRY										

Notes:
1 = Samples not collected due to poor aquifer recovery.
2 = Samples were collected within six weeks of process wastewater land application that occurred in November 2010.
3 = MW-3 was abandoned on November 30, 2011.

Appendix B-2
IRRIGATION AND DOMESTIC WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	Field Parameters			Laboratory Analysis													
		pH (units)	EC (umhos/cm)	Temp (°C)	Alk (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	OH (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	NH3 (mg/l)	F. Col (MPN/100ml)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	NH4 (mg/l)
IR-1	12/2/08	7.54	532	15.9	218	265	<1	<1	25	6.54	34.6	354	0.08	---	56	30	19	---
	6/16/09	6.4	677	21	---	---	---	---	---	6.17	---	356	0.09	7	---	---	---	---
	11/24/09	7.35	561	20.2	222	271	<1	<1	25.7	6.06	33.4	360	0.06	2	58	28	19	0.08
	6/2/10	7.72	527	---	---	---	---	---	---	6.72	---	---	---	---	---	---	---	---
	12/16/10	7.29	528	18.2	220	269	<1	<1	26.4	7.31	33.8	375	0.04 J	<2	50	30	20	0.04 J
	12/18/12	6.90	551	19.0	220	268	<1	<1	25.2	6.91	30.4	342	0.03J	<2	56	30	20	0.04
	12/22/14	7.43	515	20.0	229	279	<1	<1	25.1	6.07	30.7	352	<0.03	<2	61	30	20	<0.04
	12/7/16	6.90	639	17.4	236	288	<1	<1	30.0	6.49	34.5	358	<0.01	<2	61.2	32.3	20.5	<0.01
	12/13/18	7.46	590	17.8	233	284	<2	<2	28.4	6.36	31.5	358	<0.025	<2	67.8	31.8	21.6	<0.0321
IR-2	12/2/08	7.35	569	16.3	251	306	<1	<1	27.3	7.3	40.4	390	0.05	---	60	36	24	---
	6/16/09	7.18	634	22	---	---	---	---	---	6.82	---	403	0.18	2	---	---	---	---
	11/24/09	6.96	623	21.2	256	312	<1	<1	27	6.53	38	391	0.05	<2	62	33	24	0.07
	6/2/10	7.09	580	---	---	---	---	---	---	13.3	---	---	---	---	---	---	---	---
	12/16/10	7.00	644	16.4	270	329	<1	<1	36.6	11.4	42.5	465	<0.03	<2	58	40	30	<0.03
	12/18/12	6.95	699	18.7	295	360	<1	<1	30.8	5.84	33.8	426	0.08	8	60	38	29	0.10
	12/22/14	7.02	642	18.5	302	368	<1	<1	29.6	4.62	33.3	419	<0.03	50	69	38	22	<0.04
	12/7/16	6.94	691	17.7	281	343	<1	<1	33.8	4.94	35.3	407	<0.01	<2	61.3	35.7	29.3	<0.01
	12/13/18	UNABLE TO SAMPLE-WELL NO LONGER OPERATIONAL																
IR-3	12/2/08	7.4	484	15.3	218	266	<1	<1	23.3	4.91	35	343	0.06	---	62	24	21	---
	6/16/09	7.14	620	19.9	---	---	---	---	---	5.09	---	370	0.09	<2	---	---	---	---
	11/24/09	7.5	544	18.8	216	263	<1	<1	24.1	4.66	36.3	350	0.04	<2	62	23	21	0.05
	6/2/10	7.48	534	---	---	---	---	---	---	5.19	---	---	---	---	---	---	---	---
	12/16/10	7.01	526	15.8	214	261	<1	<1	26.7	5.28	45.7	374	<0.03	<2	57	23	23	<0.03
	12/18/12	7.05	553	18.0	216	264	<1	<1	24.3	5.25	33.8	332	0.32	4	62	24	30	0.41
	12/22/14	7.31	505	17.8	218	266	<1	<1	21.7	6.74	30.8	334	<0.03	<2	66	26	22	<0.04
	12/7/16	7.07	516	15.0	206	252	<1	<1	22.3	4.32	32.2	302	<0.01	<2	57.9	22.1	20.1	<0.01
	12/13/18	UNABLE TO SAMPLE-WELL NO LONGER OPERATIONAL																
IR-4	12/2/08	7.29	641	13.4	268	327	<1	<1	33.7	9.92	45.2	465	0.06	---	80	30	28	---
	6/16/09	7.02	678	21.2	---	---	---	---	---	7.88	---	402	0.12	<2	---	---	---	---
	11/24/09	7.28	700	19.5	274	334	<1	<1	32.9	8.58	43.9	441	0.04	<2	80	29	28	0.05
	6/2/10	7.45	730	---	---	---	---	---	---	11.7	---	---	---	---	---	---	---	---
	12/16/10	6.90	650	17.0	277	337	<1	<1	34.0	10.2	48.4	455	0.05	<2	73	29	30	0.05
	12/18/12	6.95	736	17.5	277	338	<1	<1	34.8	11.1	45.5	443	<0.03	2	83	32	30	<0.04

Appendix B-2
IRRIGATION AND DOMESTIC WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	Field Parameters			Laboratory Analysis													
		pH (units)	EC (umhos/ cm)	Temp (°C)	Alk (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	OH (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	NH3 (mg/l)	F. Col (MPN/ 100ml)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	NH4 (mg/l)
IR-4	12/22/14	UNABLE TO SAMPLE																
	5/29/15	7.33	929	18.9	361	441	<1	<1	45.3	16.8	58.5	618	<0.03	<2	114	42.7	33.2	<0.04
	12/7/16	6.96	957	15.1	365	445	<1	<1	47.1	16.5	70.8	616	<0.05	<2	116	44.1	34.9	<0.06
	12/13/18	UNABLE TO SAMPLE-WELL NO LONGER OPERATIONAL																
IR-5	12/2/08	7.44	546	16.4	230	280	<1	<1	28.3	8.89	37.2	383	0.06	---	63	31	21	---
	6/16/09	6.86	670	22.4	---	---	---	---	---	7.21	---	376	0.11	<2	---	---	---	---
	11/24/09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/2/10	7.37	584	---	---	---	---	---	---	9.18	---	---	---	---	---	---	---	---
	12/16/10	7.12	562	17.7	239	292	<1	<1	27.1	8.24	35.1	403	0.04 J	2	58	32	23	0.04 J
	12/18/12	7.03	641	18.0	256	312	<1	<1	28.9	8.88	37.0	401	0.03J	<2	66	33	24	0.04
	12/22/14	7.24	723	18.8	316	385	<1	<1	34.9	9.44	38.6	481	<0.03	2	83	42	29	<0.04
	12/7/16	7.00	850	15.5	341	416	<1	<1	40.6	11.6	47.0	514	<0.01	2	91.6	46.5	29.6	<0.01
	12/13/18	7.08	842	14.8	334	407	<2	<2	41.2	7.21	44.2	512	<0.025	<2	97.3	45.7	31.1	<0.0321
IR-6	5/29/15	UNABLE TO SAMPLE																
	12/17/15	7.73	386	18.5	153	187	<1	<1	9.94	0.96	7.37	193	<0.01	<2	20.5	17.2	26.3	<0.04
	12/18/17	7.4	360	18.4	150	183	<2	<2	11.7	1.50	10.1	212	<0.01	<2	22.5	18.9	24.0	<0.01
	12/13/18	7.94	382	19.9	172	210	<2	<2	14.9	2.40	11.4	231	<0.025	<2	24	18.8	38.7	<0.0321
Barn	12/2/08	7.31	496	16.1	209	255	<1	<1	23.4	6.53	34.5	351	0.8	---	54	30	20	---
	6/16/09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11/24/09	7.35	540	21.9	213	260	<1	<1	23.4	6.43	33.6	354	0.04	<2	53	29	20	0.05
	6/2/10	7.38	525	---	---	---	---	---	---	6.96	---	---	---	---	---	---	---	---
	12/16/10	6.98	515	15.5	210	257	<1	<1	23.2	7.47	34.2	357	<0.03	<2	49	29	21	<0.03
	12/18/12	7.37	532	18.2	207	252	<1	<1	23.8	6.98	31.3	336	<0.03	<2	48	27	19	<0.03
	12/22/14	7.34	509	19.6	214	262	<1	<1	23.6	6.65	31.9	332	0.04 J	<2	53	29	20	0.06 J
	12/7/16	7.85	354	19.1	161	197	<1	<1	13.3	1.39	8.8	195	<0.01	<2	21.4	17.9	30.7	<0.01
	12/13/18	6.78	378	18.2	161	196	<2	<2	14.1	2.49	11.8	222	<0.025	<2	25	19.2	34.8	<0.0321
House	12/2/08	7.31	523	15.7	208	254	<1	<1	23.8	6.71	33.9	343	0.08	---	54	30	19	---
	6/16/09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11/24/09	7	540	23.6	239	292	<1	<1	23.7	0.04	33.9	336	0.05	<2	53	28	19	0.07
	6/2/2010	7.44	538	---	---	---	---	---	---	2.38	---	---	---	---	---	---	---	---
	12/16/10	6.76	520	16.4	211	257	<1	<1	23.4	7.34	34.2	357	0.05	<2	48	29	21	0.05
	12/18/12	7.21	536	14.1	207	252	<1	<1	24.2	7.03	31.2	341	<0.03	<2	52	29	20	<0.04
	12/22/14	7.61	504	16.6	214	261	<1	<	23.7	6.77	31.9	332	<0.03	2	53	29	21	<0.04

Appendix B-2
IRRIGATION AND DOMESTIC WELL HISTORICAL ANALYTICAL RESULTS

Well No.	Date	Field Parameters			Laboratory Analysis													
		pH (units)	EC (umhos/ cm)	Temp (°C)	Alk (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	OH (mg/l)	Cl (mg/l)	NO3-N (mg/l)	SO4 (mg/l)	TDS (mg/l)	NH3 (mg/l)	F. Col (MPN/ 100ml)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	NH4 (mg/l)
House	12/7/16	7.41	630	13.9	212	259	<1	<1	21.9	4.67	21.7	304	<0.01	<2	48.3	27.7	27.4	<0.01
	12/13/18	7.48	718	17.8	289	353	<2	<2	35.4	6.88	36.9	462	<0.025	<2	84.4	39.3	28.9	<0.0321

Notes:
-- = Not analyzed.
J Flag = Constituent detected but concentration below reporting limit.
See Appendix A for a complete list of abbreviations.

Appendix B-3
HISTORICAL GROUNDWATER ELEVATIONS, MONITORING WELLS

Well No.	Date	Top of Casing Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
MW-1	8/2/2005	221.28	37.44	183.84
	9/21/2006		35.88	185.40
	5/31/2007		42.96	178.32
	12/28/2007		42.82	178.46
	5/28/2008		42.39	178.89
	12/2/2008		46.21	175.07
	5/29/2009		Dry	--
	11/24/2009		Dry	--
	5/12/2010		40.65	180.63
	12/13/2010		42.82	178.46
	6/9/2011		40.72	180.56
	12/2/2011		42.28	179.00
	5/16/2012		Dry	--
	12/11/2012		Dry	--
	5/7/2013		Dry	--
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		43.00	178.28
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		43.26	178.02
	12/17/2019		37.09	184.19
MW-2	8/2/2005	214.59	38.74	175.85
	9/21/2006		38.34	176.25
	5/31/2007		42.56	172.03
	12/28/2007		46.06	168.53
	5/28/2008		43.99	170.60
	12/2/2008		Dry	--
	5/29/2009		48.71	165.88
	11/24/2009		Dry	--
	5/12/2010		44.94	169.65
	12/13/2010		47.53	167.06
	6/9/2011		43.25	171.34
	12/13/2011		45.88	168.71
	5/16/2012		48.37	166.22
	12/11/2012		Dry	--
	5/7/2013		48.36	166.23
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		48.41	166.18
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		49.31	165.28
	12/17/2019		Dry	--
MW-3[1]	8/2/2005	215.06	38.88	176.18
	9/21/2006		38.40	176.66
	5/31/2007		42.19	172.87
	12/28/2007		46.10	168.96
	5/28/2008		43.47	171.59
	12/2/2008		43.42	171.64

Appendix B-3
HISTORICAL GROUNDWATER ELEVATIONS, MONITORING WELLS

Well No.	Date	Top of Casing Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
	5/29/2009		48.35	166.71
	11/24/2009		Dry	--
	5/12/2010		44.38	170.68
	12/13/2010		47.00	168.06
	6/9/2011		41.27	173.79
	8/2/2005		32.05	174.63
	9/21/2006		31.82	174.86
	5/31/2007		38.68	168.00
	12/28/2007		41.88	164.80
	5/28/2008		40.35	166.33
	12/2/2008		Dry	--
	5/29/2009		44.90	161.78
	11/24/2009		Dry	--
	5/12/2010		38.25	168.43
	12/13/2010		43.92	162.76
	6/9/2011		39.31	167.37
	12/2/2011		42.75	163.93
	5/16/2012		Dry	--
	12/11/2012		Dry	--
MW-4	5/7/2013	206.68	Dry	--
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		44.87	161.81
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		45.62	161.06
	12/17/2019		Dry	--
	8/2/2005		32.15	195.95
	9/21/2006		29.01	199.09
	5/31/2007		38.35	189.75
	12/28/2007		41.88	186.22
	5/28/2008		36.21	191.89
	12/2/2008		35.38	192.72
	5/29/2009		39.17	188.93
	11/24/2009		39.88	188.22
	5/12/2010		31.93	196.17
	12/13/2010		32.78	195.32
	6/9/2011		34.04	194.06
	12/2/2011		32.55	195.55
	5/16/2012		41.32	186.78
	12/11/2012		34.41	193.96
MW-5	5/7/2013	228.10	35.68	192.42
	12/10/2013		36.45	191.65
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		43.80	184.30
	12/7/2016		41.22	186.88
	5/24/2017		31.84	196.26
	12/18/2017		34.45	193.65
	5/31/2018		42.97	185.13
	12/13/2018		Dry	--
	5/30/2019		30.85	197.25
	12/17/2019		32.66	195.44
	8/2/2005		35.54	177.52

Appendix B-3
HISTORICAL GROUNDWATER ELEVATIONS, MONITORING WELLS

Well No.	Date	Top of Casing Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
MW-6	9/21/2006	213.06	Dry	--
	5/31/2007		Dry	--
	12/28/2007		34.95	178.11
	5/28/2008		40.48	172.58
	12/2/2008		Dry	--
	5/29/2009		45.41	167.65
	11/24/2009		Dry	--
	5/12/2010		40.91	172.15
	12/13/2010		43.55	169.51
	6/9/2011		39.51	173.55
	12/13/2011		42.00	171.06
	5/16/2012		45.13	167.93
	12/11/2013		Dry	--
	5/7/2013		44.96	168.10
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		44.36	168.70
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		45.39	167.67
	12/17/2019		46.83	166.23
MW-8	5/28/2008	210.28	41.98	168.30
	12/2/2008		Dry	--
	5/29/2009		Dry	--
	11/24/2009		Dry	--
	5/12/2010		43.58	166.70
	12/13/2010		46.16	164.12
	6/9/2011		41.64	168.64
	12/13/2011		44.35	165.93
	5/16/2012		46.23	164.05
	12/11/2012		Dry	--
	5/7/2013		46.53	163.75
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		47.34	162.94
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		Dry	--
	12/17/2019		Dry	--
MW-9	5/28/2008	207.30	40.70	166.60
	12/2/2008		49.17	158.13
	5/29/2009		44.44	162.86
	11/24/2009		Dry	--
	5/12/2010		42.92	164.38
	12/13/2010		45.73	161.57
	6/9/2011		40.74	166.56
	12/13/2011		43.46	163.84
	5/16/2012		44.85	162..45
	12/11/2012		Dry	--
	5/7/2013		44.56	162.74

Appendix B-3
HISTORICAL GROUNDWATER ELEVATIONS, MONITORING WELLS

Well No.	Date	Top of Casing Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
MW-9	12/10/2013	207.30	Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		47.55	159.75
	12/18/2017		50.74	156.56
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		48.48	158.82
	12/17/2019		49.41	157.89
MW-10	5/28/2008	209.52	39.29	170.23
	12/2/2008		Dry	--
	5/29/2009		44.58	164.94
	11/24/2009		Dry	--
	5/12/2010		40.25	169.27
	12/13/2010		43.91	165.61
	6/9/2011		38.95	170.57
	12/13/2011		42.34	167.18
	5/16/2012		Dry	--
	12/11/2012		Dry	--
	5/7/2013		Dry	--
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		44.61	164.91
	12/18/2017		Dry	--
	5/31/2018		Dry	--
	12/13/2018		Dry	--
	5/30/2019		45.12	164.40
	12/17/2019		Dry	--
MW-11	5/28/2008	215.93	44.03	171.90
	12/2/2008		Dry	--
	5/29/2009		48.02	167.91
	11/24/2009		Dry	--
	5/12/2010		43.82	172.11
	12/13/2010		47.06	168.87
	6/9/2011		42.90	173.03
	12/13/2011		45.38	170.55
	5/16/2012		45.12	170.81
	6/12/2012		45.24	170.69
	12/11/2012		Dry	--
	5/7/2013		46.47	169.46
	12/10/2013		Dry	--
	5/21/2014		Dry	--
	12/22/2014		Dry	--
	5/29/2015		Dry	--
	12/17/2015		Dry	--
	6/7/2016		Dry	--
	12/7/2016		Dry	--
	5/24/2017		46.35	169.58
	12/18/2017		Dry	--
	5/31/2017		Dry	--
	12/13/2018		Dry	--
	5/30/2019		47.99	167.94
	12/17/2019		Dry	--

Appendix B-3 HISTORICAL GROUNDWATER ELEVATIONS, MONITORING WELLS				
Well No.	Date	Top of Casing Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
[1] = Monitoring Well MW-3 abandoned on November 30, 2011				