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## APPENDIX J

### Nutrient Management Report and Waste Management Report

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# NUTRIENT MANAGEMENT PLAN

## REVISION-PROPOSED

Developed to reflect proposed conditions

MARCH - 2020

PREPARED FOR:

AZEVEDO DAIRY #2  
7618 HIGHWAY 59  
EL NIDO CA 95317

PREPARED BY:



MARIANN PEDROSO  
PO BOX 906  
NEWMAN CA 95360

**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

**DAIRY FACILITY INFORMATION**

**A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY:** Azevedo Dairy #2

Physical address of dairy:

7618 Highway 59	El Nido	Merced	95317
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address): \_\_\_\_\_

Date facility was originally placed in operation: 01/01/1982

Regional Water Quality Control Board Basin Plan designation: San Joaquin River Basin

County Assessor Parcel Number(s) for dairy facility:

0075-0010-0003-0000

**B. OPERATOR NAME:** Azevedo, Alexandrina Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido Rd	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

**OPERATOR NAME:** Azevedo, Antonio Telephone no.: (209) 564-7596

Landline Cellular

2025 W El Nido Rd	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

**C. LEGAL OWNER NAME:** Azevedo, Alexandrina Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido Rd	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

**LEGAL OWNER NAME:** Azevedo, Antonio Telephone no.: (209) 564-7596

Landline Cellular

2025 W El Nido Rd	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

**D. CONTACT NAME:** Pedroso, Mariann Telephone no.: (209) 862-4291 (209) 277-2817

Landline Cellular

Title: Technical Service Provider

P.O. Box 906	Newman	CA	95360
Mailing Address Number and Street	City	State	Zip Code

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AVAILABLE NUTRIENTS

**A. HERD INFORMATION**

The milk cow dairy is currently regulated under individual Waste Discharge Requirements.

Total number of milk and dry cows combined as a baseline value in response to the Report of Waste Discharge (ROWD) request of October, 2005:

3,500 milk and dry cows combined (regulatory review is required for any expansion)

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo. to breeding)	Calves (4-6 mo.)	Calves (0-3 mo.)
Present count	3,000	500	500	0	0	0
Maximum count	3,000	500	500	0	0	0
Avg live weight (lbs)	1,200	1,250	875	0		
Daily hours on flush	20	20	18	0	0	0

Predominant milk cow breed: Jersey-Holstein Cross

Average milk production: 65 pounds per cow per day

**B. IRRIGATION SOURCES**

Irrigation Source Name	Type	Nitrogen (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Discharge Rate
Irrigation Well	Groundwater (well)	6.80	0.00	0.00	750 gpm

**C. NUTRIENT IMPORTS**

*No nutrient imports entered.*

**D. NUTRIENT EXPORTS**

Nutrient Type/Name	Quantity	Moisture	Nitrogen	Phosphorus (as P2O5)	Potassium (as K2O)
Separated solids	7,000.00 ton	66.0%	3.120%	2.120%	1.800%
Separated solids	9,000.00 ton	66.0%	3.120%	2.120%	1.800%
Corral solids	9,000.00 ton	36.6%	2.200%	0.970%	2.300%
Corral solids	5,600.00 ton	36.6%	2.200%	0.970%	2.300%

Total nitrogen exported: 746,737.60 lbs

Total phosphorus exported: 179,270.58 lbs

Total potassium exported: 515,956.55 lbs



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**E. STORAGE PERIOD**

Storage period is the maximum period of time anticipated between land application of process wastewater (from storage ponds/lagoons) to croplands. A qualified agronomist and civil engineer should collaborate and collectively consider predominant soil types, soil infiltration rates, maximum depth, available water, field capacity, permanent wilting point, allowable depletion, crop water use, evapotranspiration, precipitation, irrigation system capacity, water delivery constraints, crop nutrient requirements, soil nutrient adsorption/desorption, rooting depth, nutrient accumulation/availability for current and future crop needs, facility wide process wastewater storage capacity and other factors as deemed necessary across all croplands where process wastewater is applied in selecting a storage period. In many cases conflicts will arise between crop water demands, crop nutrient demands and insufficient process wastewater storage capacity. Process wastewater may not be the best choice as a source of either water and/or nutrients to meet crop demands throughout the year. Groundwater and surface water vulnerability has been considered.

The storage period selected in this Nutrient Management Plan is consistent with the storage period selected in the Waste Management Plan.

Storage period: 120 days

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**APPLICATION AREA**

**A. ASSESSOR PARCEL NUMBER:** 0075-0010-0003-0000

Legal owner of parcel: Owned by Dairy

**B. FIELD NAME:** 1

Cropable acres: 19

Predominant soil type: Loam/Sandy Loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Berm

**Crops grown and rotation:**

Crop Type	Plant Date	Harvest Date	Acres Planted
Oats, silage-soft dough	Late October	Late April	19
Sudangrass, silage	Early May	Middle October	19

**FIELD NAME:** 2

Cropable acres: 61

Predominant soil type: Loam/Sandy Loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Returned to retention pond

**Crops grown and rotation:**

Crop Type	Plant Date	Harvest Date	Acres Planted
Oats, silage-soft dough	Late October	Late April	61
Sudangrass, silage	Early May	Middle October	61

**C. LAND APPLICATION AREA FIELDS AND PARCELS**

Field name	Cropable acres	Total harvests	Parcel number
1	19	4	0075-0010-00030000
2	61	4	0075-0010-00030000
Land application area totals	80	8	

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**NUTRIENT BUDGET**

**A. NUTRIENT BUDGET FOR CROP: 1 / Oats, silage-soft dough**

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (with fertilizer) Nutrient source: Retention pond (lagoon) Application method: Pipeline	3	80.0 50%	15.0 80%	82.0 80%	259.4															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well</td><td>6.5</td><td>0.0</td><td>0.0</td><td>48.0</td></tr><tr><td></td><td>6.5</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well	6.5	0.0	0.0	48.0		6.5	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well	6.5	0.0	0.0	48.0																
	6.5	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	19.4	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	240.0	45.0	246.0
Other	0.0	0.0	0.0
Atmospheric deposition	3.5		
Nutrients applied	262.9	45.0	246.0
Potential crop nutrient removal	193.2	33.6	180.6
Nutrient balance	69.7	11.4	65.4
Applied to removal ratio	1.36	1.34	1.36

Fresh water applied: 1.05 feet Total harvests: 1

**NUTRIENT BUDGET FOR CROP: 1 / Sudangrass, silage**

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Subsurface	2	0.0 0%	0.0 0%	0.0 0%	19.4															
<table><tr><th>Irrigation Source</th><th>N (lbs/acre)</th><th>P (lbs/acre)</th><th>K (lbs/acre)</th><th>Runtime (hrs)</th></tr><tr><td>Irrigation Well</td><td>9.7</td><td>0.0</td><td>0.0</td><td>72.0</td></tr><tr><td></td><td>9.7</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well	9.7	0.0	0.0	72.0		9.7	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well	9.7	0.0	0.0	72.0																
	9.7	0.0	0.0																	



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**NUTRIENT BUDGET FOR CROP (CONTINUED): 1 / Sudangrass, silage**

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (with fertilizer) Nutrient source: Retention pond (lagoon) Application method: Pipeline	5	60.0 50%	14.0 80%	118.0 80%	348.4															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well</td><td>9.7</td><td>0.0</td><td>0.0</td><td>72.0</td></tr><tr><td></td><td>9.7</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well	9.7	0.0	0.0	72.0		9.7	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well	9.7	0.0	0.0	72.0																
	9.7	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	67.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	300.0	70.0	590.0
Other	0.0	0.0	0.0
Atmospheric deposition	10.5		
Nutrients applied	378.2	70.0	590.0
Potential crop nutrient removal	276.0	52.8	420.0
Nutrient balance	102.2	17.2	170.0
Applied to removal ratio	1.37	1.33	1.40

Fresh water applied: 3.66 feet Total harvests: 3

**NUTRIENT BUDGET FOR CROP: 2 / Oats, silage-soft dough**

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	3	61.0 50%	10.0 80%	55.0 80%	204.1
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well	7.0	0.0	0.0	168.0	
	7.0	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	21.1	0.0	0.0



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Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	183.0	30.0	165.0
Other	0.0	0.0	0.0
Atmospheric deposition	3.5		
Nutrients applied	207.6	30.0	165.0
Potential crop nutrient removal	149.8	22.4	117.6
Nutrient balance	57.8	7.6	47.4
Applied to removal ratio	1.39	1.34	1.40

Fresh water applied: 1.14 feet Total harvests: 1

**NUTRIENT BUDGET FOR CROP: 2 / Sudangrass, silage**

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Subsurface	2	0.0 0%	0.0 0%	0.0 0%	20.1															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well</td><td>10.0</td><td>0.0</td><td>0.0</td><td>240.0</td></tr><tr><td></td><td>10.0</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well	10.0	0.0	0.0	240.0		10.0	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well	10.0	0.0	0.0	240.0																
	10.0	0.0	0.0																	
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	5	60.0 50%	14.0 80%	118.0 80%	350.2															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well</td><td>10.0</td><td>0.0</td><td>0.0</td><td>240.0</td></tr><tr><td></td><td>10.0</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well	10.0	0.0	0.0	240.0		10.0	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well	10.0	0.0	0.0	240.0																
	10.0	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	70.3	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	300.0	70.0	590.0
Other	0.0	0.0	0.0
Atmospheric deposition	10.5		
Nutrients applied	380.8	70.0	590.0
Potential crop nutrient removal	276.0	52.8	420.0

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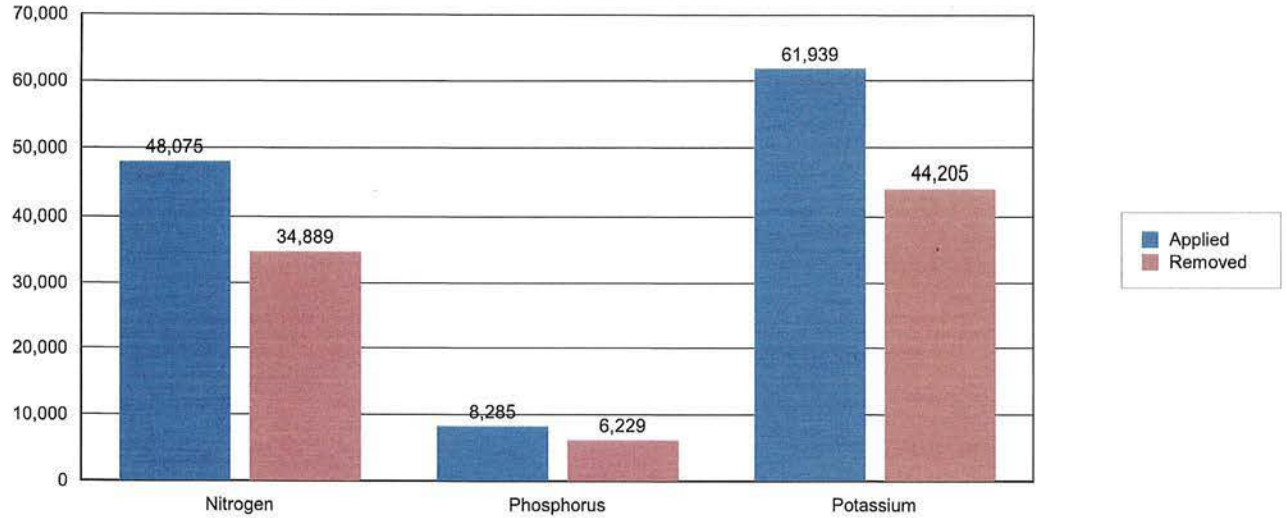
Nutrient balance	104.8	17.2	170.0
Applied to removal ratio	1.38	1.33	1.40

Fresh water applied: 3.80 feet      Total harvests: 3

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NUTRIENT APPLICATIONS, POTENTIAL REMOVAL, AND BALANCE

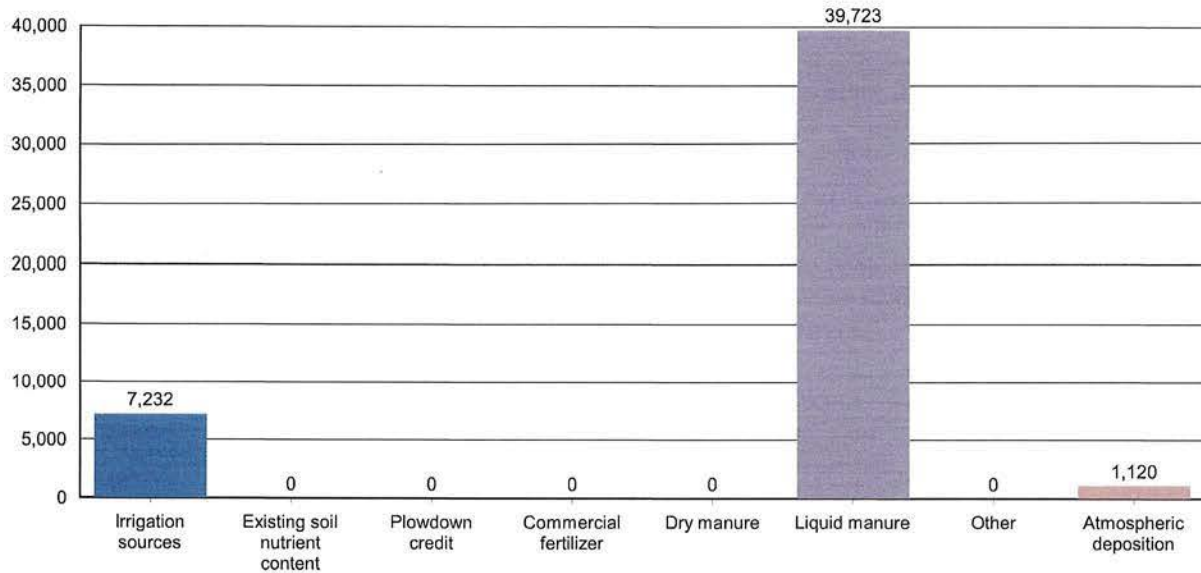
**A. POUNDS OF NUTRIENT APPLIED VS. CROP REMOVAL POTENTIAL**



	Total N (lbs)	Total P (lbs)	Total K (lbs)
Irrigation sources	7,231.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	39,723.0	8,285.0	61,939.0
Other	0.0	0.0	0.0
Atmospheric deposition	1,120.0		
Nutrients applied to all crops	48,074.7	8,285.0	61,939.0
Potential crop nutrient removal	34,888.6	6,228.8	44,205.0
Nutrient balance	13,186.1	2,056.2	17,734.0
Applied to removal ratio	1.38	1.33	1.40

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**B. POUNDS OF NITROGEN APPLIED BY NUTRIENT SOURCE**



	Total N (lbs)	Total P (lbs)	Total K (lbs)
Irrigation sources	7,231.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	39,723.0	8,285.0	61,939.0
Other	0.0	0.0	0.0
Atmospheric deposition	1,120.0		
Nutrients applied to all crops	48,074.7	8,285.0	61,939.0
Potential crop nutrient removal	34,888.6	6,228.8	44,205.0
Nutrient balance	13,186.1	2,056.2	17,734.0
Applied to removal ratio	1.38	1.33	1.40



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**NUTRIENT BALANCE**

**A. WHOLE FARM BALANCE**

	Total N (lbs)	Total P (lbs)	Total K (lbs)
Nutrients in storage from herd*			
Daily gross	3,073.5	510.1	1,547.0
Annual gross	1,121,823.4	186,176.3	564,672.7
Net to pond storage after ammonia losses (30% loss applied)	651,629.1	154,477.8	470,560.6
Net to drylot storage after ammonia losses (30% loss applied)	133,647.3	31,698.6	94,112.1
Net in storage (30% loss applied)	785,276.4	186,176.3	564,672.7
Irrigation sources	7,231.7	0.0	0.0
Atmospheric deposition	1,120.0		
Imports	0.0	0.0	0.0
Exports	746,737.6	179,270.6	515,956.6
Potential crop nutrient removal	34,888.6	6,228.8	44,205.0
Nutrient balance	12,001.9	676.9	4,511.1
Nutrient balance ratio	1.34	1.11	1.10

\* Potassium excretion from milk cows and dry cows only.

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**SAMPLING AND ANALYSIS PLAN**

**A. MANURE SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Twice per year	A composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	Corral Solids	None required	Total nitrogen, total phosphorus, potassium, and percent moisture
Each offsite export of manure	A composite sample "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.  For each manure source exported, a scaled weight by truckload will be recorded.	Corral Solids	Date exported and total weight (tons) exported	Percent moisture

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**A. MANURE SAMPLING AND ANALYSIS PLAN (CONTINUED)**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Annually	<p>Annual estimation for total manure dry weight applied to each field will be quantified using the following:</p> <p>Dry weight applied from a source to a crop per application event = weight applied * (1 - (percent moisture / 100))</p> <p>Dry weight applied to crop per application event = sum of dry weights applied from each source</p> <p>Dry weight applied to a crop = sum of dry weights applied during each application</p> <p>Dry weight applied to a field = sum of dry weights applied to each crop</p> <p>Annual estimation for total manure dry weight exported will be quantified using the following:</p> <p>Dry weight exported from a source per event = weight exported * (1 - (percent moisture / 100))</p> <p>Dry weight exported per event = sum of dry weights exported from each source</p> <p>Dry weight exported to any offsite destination = sum of dry weights exported per event</p>	Corral solids	Total dry weight (tons) manure applied annually to each land application area, and total dry weight (tons) manure exported offsite annually	None required

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**A. MANURE SAMPLING AND ANALYSIS PLAN (CONTINUED)**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each application to each land application area	For each applied manure source, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.  For each applied manure source, a scaled weight by truckload will be recorded.	Corral solids	Date applied and total weight (tons) applied	Percent moisture
Once every 2 years	For each manure source, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	Corral solids	None required	calcium, magnesium, sodium, sulfur, chloride, and fixed solids

**B. PROCESS WASTEWATER SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each application	For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	WWS	Date applied and volume (gallons or acre-inches) applied	None required



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**B. PROCESS WASTEWATER SAMPLING AND ANALYSIS PLAN (CONTINUED)**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Quarterly during one application event	For field measurement: For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.  For laboratory analyses: For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	WWS	Date applied and electrical conductivity	Laboratory analyses for nitrate-nitrogen (only when retention pond is aerated), un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium and total dissolved solids.
Annually	For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	WWS	None required	Analysis of liquid process wastewater, prior to blending with irrigation water, for pH, total dissolved solids, electrical conductivity, nitrate-nitrogen, ammonium-nitrogen, total Kjeldahl nitrogen, total phosphorus and total potassium
Once every 2 years	For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	WWS	None required	Laboratory analyses for General minerals, including: calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride

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**C. SOIL SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Once in summer of 2008 and then once every five years for each land application area (may be distributed over a 5 year period by sampling 20% of the land application areas annually)	For each field, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	Field 1 - 68 acres Field 2 - 19 acres	None required	0 to 1 foot: soluble phosphorus

**D. PLANT TISSUE SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each crop harvest from each land application area	For every 40 acres, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.  For each field and crop, a scaled weight by truckload will be recorded.	See Attached Land Application Area Table	Date harvested and total weight (tons) of harvested material removed from each land application area	Percent wet weight of harvested plant removed  Total nitrogen, phosphorus, and potassium, expressed on a dry weight basis

**E. IRRIGATION WATER SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each fresh water irrigation event for each land application area	List individual irrigation sources and the measurement method, e.g.:  Irrigation Well 1 - inline totalizing flow meter Irrigation Well 2 - flow rate multiplied by runtime Canal 1 - flow rate multiplied by runtime	List individual irrigation sources, e.g.:  Irrigation Well #1	Date applied and volume (gallons or acre-inches) applied	None required

**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

**E. IRRIGATION WATER SAMPLING AND ANALYSIS PLAN (CONTINUED)**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
One irrigation event during each irrigation season during actual irrigation events – for each irrigation water source (well and canal)	For each irrigation source, a grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected. In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.	List individual irrigation sources, e.g.:  Irrigation Well #1	None required	Electrical conductivity, total dissolved solids, and total nitrogen

**F. GROUNDWATER MONITORING SAMPLING AND ANALYSIS PLAN**

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Every five years (may be distributed over a 5-year period by sampling 20% of the wells annually)	For each domestic and agricultural supply well, a grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual wells, e.g.:  Domestic Well MB Domestic Well Houses Irrigation Well #1	None required	General minerals, including: calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, chloride  Total dissolved solids
Annually	For each domestic and agricultural supply well, a grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual wells, e.g.:  Domestic Well MB Domestic Well Houses Irrigation Well #1	Electrical conductivity and ammonium-nitrogen	Nitrate-nitrogen.  If field measurement indicates the presence of ammonium-nitrogen, the Discharger shall collect a sample for laboratory analysis of ammonium-nitrogen.



**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

NUTRIENT MANAGEMENT PLAN REVIEW

**A. NUTRIENT MANAGEMENT PLAN REVIEW**

Person who created the NMP: Pedroso, Mariann *See above for contact information.*  
Date the NMP was drafted: 03/11/2020  
Person who approved the final NMP: Pedroso, Mariann *See above for contact information.*  
Date of NMP implementation: 11/01/2022



**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

**ATTACHED MAP AND DOCUMENTATION REFERENCES**

The following list, based upon user selections and data entries, describes the minimum required attachments that must be submitted with the Nutrient Management Plan for the reporting schedule of 'July 1, 2009'.

**A. PRELIMINARY DAIRY FACILITY ASSESSMENT**

The NMP will include the initial Preliminary Dairy Facility Assessment (Attachment A) and the annual updates as required by Monitoring and Reporting Program No. R5-2007-0035. Copies of these assessments shall be maintained for 10 years.

**B. LAND AREA MAP(S)**

Identify each land application area (under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) on a single published base map

1. A field identification system (Assessor's Parcel Number; land application area; crops grown); indication if each land application is owned, rented, or leased by the Discharger; indication of what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field.
2. Process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, draining controls (berms, levees, etc.), and drainage easements.

Application area map reference number: Land App Map

Identify each field under control of the Discharger and within five miles of the dairy where neither process wastewater nor manure is applied. Each field shall be identified on a single published base map at an appropriate scale by the following:

1. Assessor's Parcel Number.
2. Total acreage.
3. Information on who owns or leases the field

Non-application area map reference number: Not Applicable

Setbacks, Buffers, and Other Alternatives to Protect Surface Water (see Technical Standard VII):

1. Identify all potential surface waters or conduits to surface water that are within 100 feet of any land application area.
2. For each land application area that is within 100 feet of a surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water (Technical Standard VII).

Setbacks and buffers map reference number: Land App Map

**C. PROCESS WASTEWATER WRITTEN AGREEMENTS**

Provide copies of written agreements with third parties that receive process wastewater for their own use from the Discharger's dairy (Technical Standards V.A.1 and V.A.3).

**Nutrient Management Plan Report**

General Order No. R5-2007-0035, Attachment C

July 1, 2009 deadline

**SAMPLING AND ANALYSIS PLAN CERTIFICATION****A. DAIRY FACILITY INFORMATION**Name of dairy or business operating the dairy: Azevedo Dairy #2

Physical address of dairy:

7618 Highway 59El NidoMerced95317

Physical Address Number and Street

City

County

Zip Code

Street and nearest cross street (if no address): \_\_\_\_\_

**B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT**

*I certify that I meet the requirements as a certified specialist in developing nutrient management plans as described in Attachment C of Waste Discharge Requirements General Order No. R5-2007-0035 and that I prepared the Sampling and Analysis plan.*

Technical Service Provider

TITLE/QUALIFICATIONS OF CERTIFIED NUTRIENT MANAGEMENT SPECIALIST



SIGNATURE OF TRAINED PROFESSIONAL

3-11-2020

DATE

Mariann Pedrosa

PRINT OR TYPE NAME

P.O. Box 906; Newman, CA 95360


MAILING ADDRESS

(209) 862-4291

PHONE NUMBER

**C. OWNER AND/OR OPERATOR CERTIFICATION**

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*



SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

Antonio Azevedo

PRINT OR TYPE NAME

PRINT OR TYPE NAME

3-11-2020

DATE

DATE



**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

**NUTRIENT BUDGET CERTIFICATION**

**A. DAIRY FACILITY INFORMATION**

Name of dairy or business operating the dairy: Azevedo Dairy #2

Physical address of dairy:

7618 Highway 59  
Number and Street

El Nido  
City

Merced  
County

95317  
Zip Code

Street and nearest cross street (if no address): \_\_\_\_\_

**B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT**

*I certify that I meet the requirements as a certified specialist in developing nutrient management plans as described in Attachment C of Waste Discharge Requirements General Order No. R5-2007-0035 and that I prepared the Nutrient Budget plan.*

Technical Service Provider

TITLE/QUALIFICATIONS OF CERTIFIED NUTRIENT MANAGEMENT SPECIALIST

  
SIGNATURE OF TRAINED PROFESSIONAL

3-11-2020  
DATE

Mariann Pedrosa

PRINT OR TYPE NAME

P.O. Box 906; Newman, CA 95360

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**C. OWNER AND/OR OPERATOR CERTIFICATION**

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

  
SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

Antonio Azevedo

PRINT OR TYPE NAME

PRINT OR TYPE NAME

3-11-2020  
DATE

DATE

General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies (General Order) requires owners and operators of existing milk cow dairies (Dischargers) to develop and implement a Nutrient Management Plan for their land application areas (land under control of the Discharger, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient cycling). The Discharger is required to maintain the NMP at the dairy, make the NMP available to Central Valley Water Board staff during their inspections, and submit the NMP to the Executive Officer upon request.

The General Order requires the Discharger to submit two Statements of Completion during development of the NMP. The Discharger may use this form to comply with the General Order requirement to submit one or both of these Statements of Completion. Parts A and E must be completed for each Statement of Completion. Parts B, C and D are to be completed for the Statements of Completion due by 1 July 2008, 31 December 2008 and 1 July 2009, respectively. Both the owner and the operator of the dairy must sign this form in Part E below.

Name of dairy or business operating the dairy: Azevedo Dairy #2

7618 Highway 59	El Nido	Merced	95317
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address):

Operator name: \_\_\_\_\_ Telephone no.: \_\_\_\_\_

Mailing Address Number and Street	City	State	Zip Code
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Legal owner name: Azevedo, Antonio Telephone no.: (209) 564-7596  
Landline Cellular

2025 W El Nido Rd	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code



**Nutrient Management Plan Report**  
General Order No. R5-2007-0035, Attachment C  
July 1, 2009 deadline

**B. STATEMENT OF COMPLETION DUE 1 JULY 2008**

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2008:

- ☒ **Item I.A.1 Land Application Information**  
Identification of land used for manure application and needed information on a facility map.
- ☒ **Item I.B Land Application Information**  
Information list for information provided on map above.
- ☒ **Item I.C Land Application Information**  
Copies of written third-party process wastewater agreements.
- ☒ **Item I.D Land Application Information**  
Identification of fields under control of the discharger within five miles of the dairy where neither process wastewater nor manure is applied.
- ☒ **Item II Sampling and Analysis Plan**
- ☒ **Item IV Setbacks, Buffers, and Other Alternatives to Protect Surface Water**  
Identification of all potential surface waters or conduits to surface waters within 100 feet of land application areas and appropriate protection.
- ☒ **Item VI Record-Keeping Requirements**  
Identification of monitoring records that will be maintained as required in the production and land application areas.

Has Item II (Sampling and Analysis Plan) of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

☒ Yes      ☐ No

**C. STATEMENT OF COMPLETION DUE 31 DECEMBER 2008**

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 31 December 2008:

- ☒ **Item V Field Risk Assessment**  
Evaluation of the effectiveness of management practices used to control the discharge of waste constituents from land application areas by assessing the water quality monitoring results of discharges of manure, process wastewater, tailwater, subsurface (tile) drainage, or storm water from the land application areas.

**D. STATEMENT OF COMPLETION DUE 1 JULY 2009**

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2009:

- ☒ **Item I.A.2 Land Application Area Information**  
Identification of process wastewater conveyance, mixing and drainage information for each land application area on a facility map.
- ☒ **Item III Nutrient Budget**  
Established planned rates of nutrient applications by crop based on nutrient monitoring results for each land application area.

Has Item III (Nutrient Budget) of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

☒ Yes      ☐ No

**Nutrient Management Plan Report**

General Order No. R5-2007-0035, Attachment C

July 1, 2009 deadline

**E. CERTIFICATION STATEMENT**

*I certify under penalty of law that I have completed the items of the Nutrient Management Plan that are checked in Parts B, C and/or D above for the dairy identified in Part A above and that the appropriate certified nutrient management specialist has certified the items requiring such certification as noted in part B and/or D above and that I have personally examined and am familiar with the information submitted in Parts A, B, C and D of this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

*Antonio Azevedo*

SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

Antonio Azevedo

PRINT OR TYPE NAME

PRINT OR TYPE NAME

*3-11-2020*

DATE

DATE



## LAND APPLICATION AREA FIELD INFORMATION ATTACHMENT





DAIRY NAME: AZEVEDO DAIRY #2

DAIRY ADDRESS: 7618 HIGHWAY 59 EL NIDO CA 95317

[illegible]



## Legend:

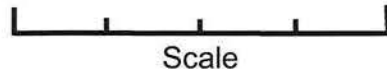
- Field Boundary
- Flow Direction
-  Irrigation Well w/ Setback
-  Fixed Irrigation Pump
- Irrigation Pipeline
-  Tail Water
-  Earthen Irrigation Ditch
- B-B- Berm
- D Drain



**CAS**

**CARDOSO AG SERVICES**

1834 Ft.



Scale

Antonio Azevedo Dairy #2  
Merced County, CA

Project No.

Date:  
3/12/2020

Drawn By:  
MD

App By:  
MP

**Field Map  
Proposed**



# Waste Management Plan For Antonio Azevedo Dairy #2 Merced County, CA

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Prepared For:  
Antonio Azevedo Dairy #2  
1257 W. Roosevelt Road  
El Nido, CA 95317





**SOSA**  
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AGRICULTURE

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OAKDALE, CA 95361  
PHONE: (209)238-3151  
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**WASTE MANAGEMENT PLAN  
FOR  
AZEVEDO DAIRY #2  
MERCED COUNTY, CA**

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**1. NARRATIVE**

- a. Introduction
- b. Compliance Criteria
- c. Results and Conclusions

**2. EXHIBITS**

- a. Sheet 1 – Vicinity Map
- b. Sheet 2 – Site Map – Land Application Areas
- c. Sheet 3 – Site Map – Production Area
- d. Sheet 4 – Production Area Hydrologic Map
- e. Sheet 5 – FEMA Panel No. 06047C0675G

**3. DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE DOCUMENTATION**

- a. Waste Management Plan Report / Process Wastewater Calculations
- b. Flood Protection Analysis
- c. Vector Control Plan

## 1. NARRATIVE

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## **INTRODUCTION**

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This Waste Management Plan (WMP) has been prepared at the request of the subject dairy's owner and/or operator in order to comply with Section H.1.b., *Waste Management Plan*, of Order No. R5-2013-0122, *Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies*, (Order) adopted by the California Regional Water Quality Control Board (CRWQCB) Central Valley Region. Per the requirements set forth by the aforementioned Order it is the intent of this plan to provide an evaluation of the existing milk cow facility's design, construction, operation, and maintenance for flood protection and waste containment and to determine whether the facility complies with Prohibition A.14, General Specifications B.1 through B.3, Pond Specifications C.1 through C.3, and Production Area Specifications D.1, D.4, and D.5. Should the evaluation provided by this plan determine that the existing facility does not comply with the requirements of the Order, then modifications will be proposed for the facility that will bring it into compliance and those modifications shall be made a part of this plan.



## COMPLIANCE CRITERIA

As required by the Order this plan must evaluate the existing facility's compliance with Prohibition A.14, General Specifications B.1 through B.3, Pond Specifications C.1 through C.3, and Production Area Specifications D.1, D.4, and D.5. The criteria set forth by this Prohibition and General Specifications are as follows:

**Prohibition A.14:** *"The direct discharge of wastewater into groundwater via backflow through water supply or irrigation supply wells is prohibited."*

The water, irrigation, and wastewater systems of this facility have been examined by a Registered Civil Engineer licensed in the State of California. It has been determined and hereby documented that there are no existing conditions on the project site that would allow for direct discharge of wastewater into groundwater via backflow through water supply or irrigation supply wells. The existing well that supplies the irrigation system has been constructed with an air gap so as to prevent backflow of wastewater into the well.

**General Specification B.1:** *"The existing milk cow dairy shall have facilities that are designed, constructed, operated, and maintained to retain all facility process wastewater generated during the storage period (maximum period of time anticipated between land application of process wastewater), together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm (see item II of Attachment B, which is attached to and made part of this Order)."*

Section 3.a. of this plan contains calculations that demonstrate the facility's ability to retain all process wastewater and precipitation generated by the 25-year, 24-hour storm. The tributary areas for storm drain runoff were determined by utilizing field measurements and aerial photography. The existing Wastewater Basins (WW) were field measured.

**General Specification B.2:** *"In the Sacramento and San Joaquin River Basins, ponds and manured areas at existing milk cow dairies in operation on or before 27 November 1984 shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Existing milk cow dairies that were in operation on or before 27 November 1984 and that are protected against 100-year peak stream flows must continue to provide such protection. Existing milk cow dairies built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows (Title 27 Section 22562(c))."*

The facility is in the San Joaquin River Basin and was constructed before 27 November 1984. However the facility has been expanded since 27 November 1984 and thus must have protection against the 100-year storm event. The relevant Flood Zone Map published by the Federal Emergency Management Agency (FEMA) is Panel No. 06047C675G. This map indicates that the existing dairy facility is in Zone A and is thus subject to inundation by the 100-year storm event. An analysis describing locations and levels of inundation and recommended protection measures is included in the Plan in Section 3.b.

**General Specification B.3:** *“In the Tulare Lake Basin, existing milk cow dairies that existed as of 25 July 1975 shall be protected from inundation or washout from overflow from any stream channel during 20-year peak stream flows and existing milk cow dairies constructed after 25 July 1975 shall be protected from 100-year peak stream flows. Existing milk cow dairies expanded after 8 December 1984 shall be protected from 100-year peak stream flows.”*

As the facility is in the San Joaquin River Basin this specification is not applicable.

**Pond Specification C.1:** *“The level of waste in the process wastewater retention ponds shall be kept a minimum of two (2) feet from the top of each aboveground embankment and a minimum of one (1) foot from the ground surface of each belowground pond. Less freeboard may be approved by the Executive Officer when a Civil Engineer who is registered pursuant to California law, or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work, demonstrates that the structural integrity of the pond will be maintained with the proposed freeboard.*

1' of freeboard has been assigned to the wastewater storage pond WWS as it has been constructed in ground or below grade.

**Pond Specification C.2:** *“Ponds shall be managed and maintained to prevent breeding of mosquitoes and other vectors. In particular,*

- a. Small coves and irregularities shall not be allowed around the perimeter of the water surface;*
- b. Weeds shall be minimized through control of water depth, harvesting, or other appropriate method;*
- c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and*
- d. Management shall be in accordance with the requirements of the Mosquito Abatement District.”*

An Operations and Maintenance Plan addressing these items has been included in Section 3.a. and is hereby made a part of this plan.

**Pond Specification C.3:** *“Ponds designated to contain the 25-year, 24-hour storm event runoff must have a depth marker that clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation from a 25-year, 24-hour storm event.”*

A marker meeting this specification will be installed in all the facility's ponds by the compliance date.

**Production Area Specification D.1:** *“All dirt or unpaved corrals shall be graded to promote drainage. Cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. Water troughs, permanent feed racks, and mangers shall have paved access, and water troughs shall have a drain to carry water away from the corrals. (Cal Code Regs., title 3, § 646.1.).”*

Dirt or unpaved areas are graded to promote drainage. Any areas requiring improvement are noted on Exhibit Sheets 3 and 4 and in Section 3.b.

All cow washing areas are paved with Portland Cement Concrete (PCC) and sloped to a drain which conveys wastewater to the retention ponds.

Water troughs, feed racks, and mangers have access paved with PCC. Water troughs have drains which convey wastewater to the retention ponds.

**Production Area Specification D.4:** *“All roofs, buildings, and non-manured areas located in the production area of the existing milk cow dairy shall be constructed or otherwise designed so that clean rainwater is diverted away from manured areas and waste containment facilities, unless such drainage is fully contained in the wastewater retention ponds. (Title 27, § 22562(b).)”*

The production area is designed such that rainwater that is not diverted away from manured areas and waste containment facilities is collected and conveyed to the wastewater retention ponds.

**Production Area Specification D.5:** *“Roof drainage from barns, milk houses, or shelters shall not drain into the corrals unless the corrals are properly graded and drained. (Cal Code Regs., title 3, § 661.)”*

Roof drainage is collected by gutters, downspouts, and drains and is conveyed to the wastewater retention ponds or fields as indicated in Section 3.a.

## **RESULTS AND CONCLUSIONS**

---

After conducting a visual inspection of the site, obtaining herd and facility information from the operator, performing the required measurements of facility improvements, and performing the calculations included in Section 3.a. it has been determined that the design, construction, operation, and waste containment of this facility are in compliance with Prohibition A.14 and General Specifications B.1 through B.3 and B.10 through B.16 of Order No. R5-2013-0122, *Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies*.

Some improvements will be required to ensure that the proposed facility expansion meets the General Order's requirements for flood protection. Those improvements are described in detail in Section 3.d., *Flood Protection Analysis*, of this Plan.



## 2. EXHIBITS

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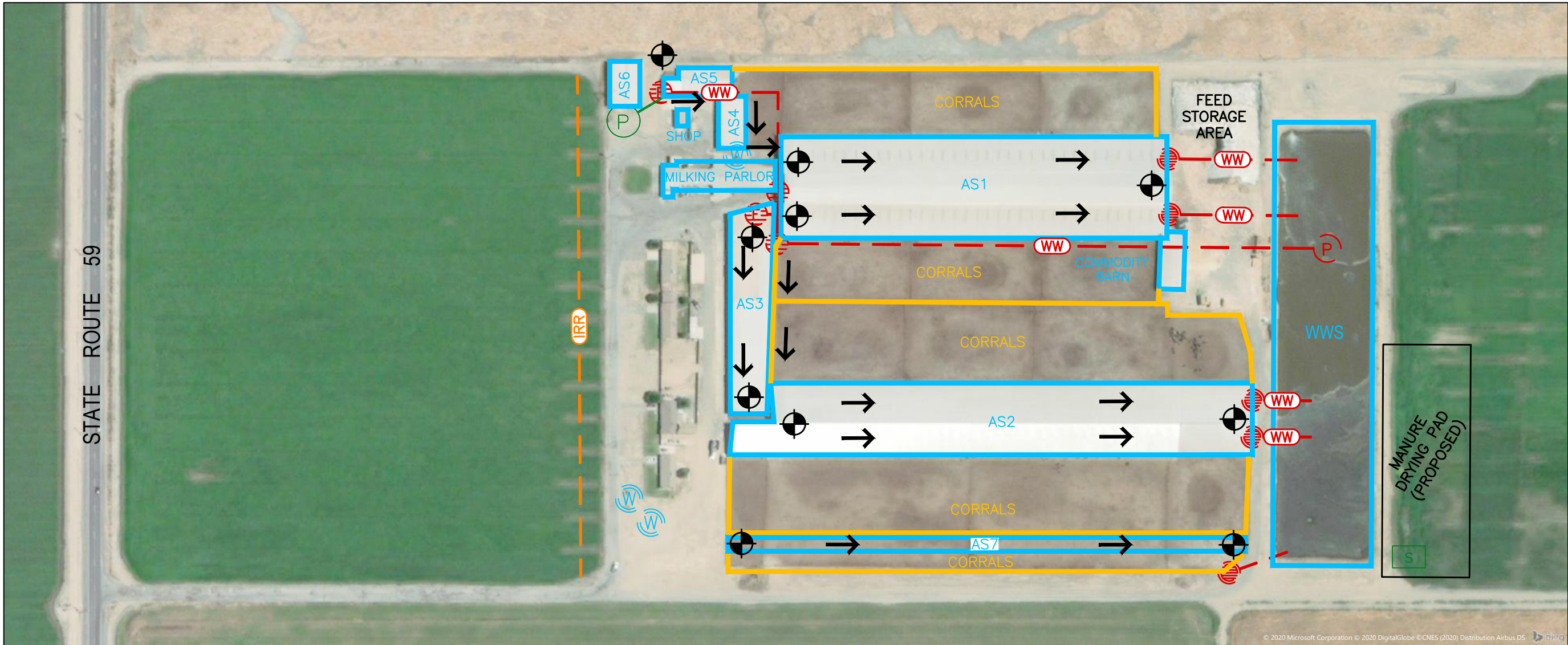
VICINITY MAP  
AZEVEDO DAIRY #2

MERCED COUNTY, CA





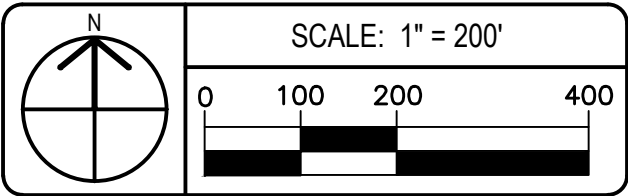




LEGEND

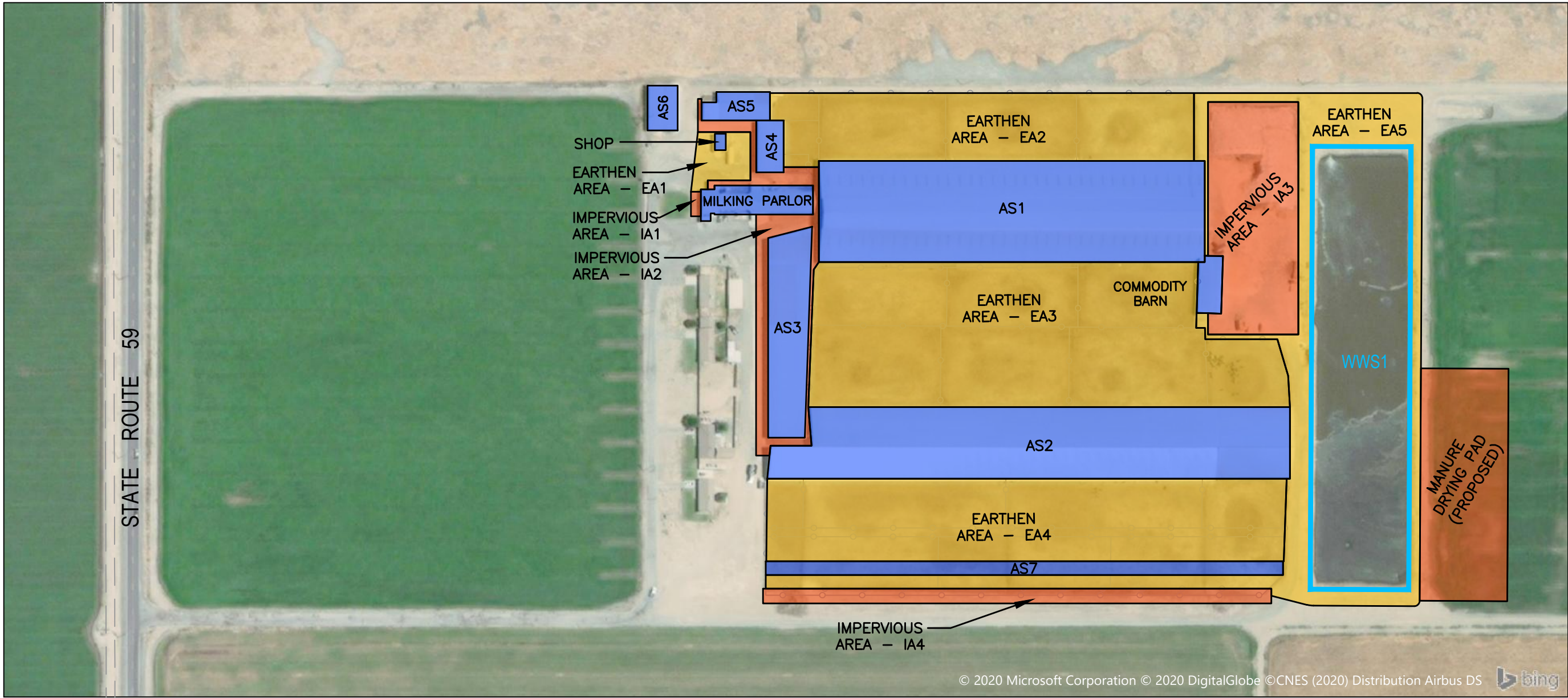
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- CORRAL AREA
- IRRIGATION LINE
- WASTEWATER LINE
- WASTEWATER LINE (PROPOSED)
- WASTEWATER SUMP WITH PUMP
- WASTEWATER SUMP WITH PUMP (PROPOSED)

- FLUSH SYSTEM DRAIN INLET
- FLUSH SYSTEM DRAIN INLET (PROPOSED)
- FLUSH SYSTEM DISCHARGE VALVE
- FLUSH SYSTEM DISCHARGE VALVE (PROPOSED)
- MECHANICAL SEPARATOR (PROPOSED)
- WELL
- GENERAL SLOPE AND DIRECTION OF FLOW
- INSPECTION POINT FOR MONITORING ANIMAL HOUSING AND FLUSH WATER CONVEYANCE SYSTEM






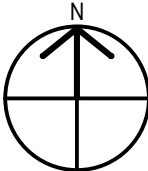
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				SYMBOL	DESCRIPTION





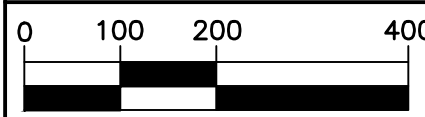
**LEGEND**

	ROOF AREA
	EARTHEN AREA
	IMPERVIOUS AREA



N

SCALE: 1" = 200'



**SHEET 4 OF 5**

**SOUSA ENGINEERING**  
INFRASTRUCTURE - DEVELOPMENT - AGRICULTURE

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PRODUCTION AREA  
HYDROLOGIC MAP

ANTONIO AZEVEDO DAIRY #2

MERCED COUNTY, CA

DRAWN BY: MS	DATE: 12/7/2020	FILE: 04_hydro.dwg	JOB NO.: 2019-039
SYMBOL	REVISIONS	DESCRIPTION	APPD.

























# National Flood Hazard Layer FIRMette



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **3/10/2020 at 8:25:16 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

37°10'46.70"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

37°10'18.04"N

120°28'48.16"W

### 3. DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE DOCUMENTATION

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

**DAIRY FACILITY INFORMATION**

**A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY:** Azevedo Dairy #2

Physical address of dairy:

7618 Highway 59	El Nido	Merced	95317
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address): \_\_\_\_\_

TRS Data and Coordinates:

9S	13E	11	Mt. Diablo	37° 10' 3.79" N	120° 30' 57.21" W
Township (T_)	Range (R_)	Section (S_)	Baseline meridian	Latitude (N)	Longitude (W)

Date facility was originally placed in operation: 01/01/1982

Regional Water Quality Control Board Basin Plan designation: San Joaquin River Basin

County Assessor Parcel Number(s) for dairy facility:

0075-0010-0003-0000

**B. OPERATOR NAME:** Azevedo, Alexandrina Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido RD	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

**OPERATOR NAME:** Azevedo, Antonio Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido RD	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

**C. LEGAL OWNER NAME:** Azevedo, Alexandrina Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido RD	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

**LEGAL OWNER NAME:** Azevedo, Antonio Telephone no.: (209) 723-0562

Landline Cellular

2025 W El Nido RD	El Nido	CA	95317
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

**D. CONTACT NAME:** Sousa, Manny Telephone no.: (209) 238-3151

Landline Cellular

Title: Civil Engineer

P.O. Box 1613	Oakdale	CA	95361
Mailing Address Number and Street	City	State	Zip Code

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**HERD AND MILKING EQUIPMENT**

**A. HERD AND MILKING**

The milk cow dairy is currently regulated under individual Waste Discharge Requirements.

Total number of milk and dry cows combined as a baseline value in response to the Report of Waste Discharge (ROWD) request of October, 2005:

3,500 milk and dry cows combined (regulatory review is required for any expansion)

Type of Animal	Present Count	Maximum Count	Daily Flush Hours	Avg Live Weight (lbs)
Milk Cows	3,000	3,000	20	1,200
Dry Cows	500	500	20	1,250
Bred Heifers (15-24 mo.)	500	500	18	875
Heifers (7-14 mo.)	0	0	0	0
Calves (4-6 mo.)	0	0	0	
Calves (0-3 mo.)	0	0	0	

Predominant milk cow breed:

Jersey-Holstein Cross

Average milk production:

65 pounds per cow per day

Average number of milk cows per string sent to the milkbarn:

300 milk cows per string

Number of milkings per day:

2.0 milkings per day

Number of times milk tank is emptied/filled each day:

2.0 per day

Number of hours spent milking each day:

22.0 hours per day

**B. MILKBARN EQUIPMENT AND FLOOR WASH**

Bulk tank wash and sanitizing:

2.0 run cycles/wash

Bulk tank wash vat volume:

100 gallons/cycle

Bulk tank wash wastewater:

400.0 gallons/day

Pipeline wash and sanitizing:

2.0 run cycles/wash

Pipeline wash vat volume:

150 gallons/cycle

Pipeline wash wastewater:

600.0 gallons/day

Reused / recycled water is the source of parlor floor wash water:

☒ Yes   ☐ No

Milkbarn / parlor floor wash volume:

7,500 gallons/day

Plate coolers type:

Well Water Cooled (Water Reused/Recycled)

Plate coolers volume:

45,349 gallons/day

Vacuum pumps / air compressors / chillers type:

Mechanically/Air Cooled

Vacuum pumps / air compressors / chillers volume:

0 gallons/day

Milkbarn and equipment wastewater volume generated daily:

46,349 gallons/day

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

**C. OTHER WATER USES**

Reused/recycled water is the source of herd drinking water: ☐ Yes ☒ No

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Bred Heifers (7-14 mo.)	Calves (4-6 mo.)	Calves (0-3 mo.)
Number of cows drinking from reusable water:	0	0	0	0	0	0
	of 3,000	of 500	of 500	of 0	of 0	of 0
Gallons per head per day:	0	0	0	0	0	0

Total reusable water consumed by herd: 0 gallons/day

Reused/recycled water is the source of sprinkler pen water: ☒ Yes ☐ No

Number of sprinklers in the holding pen: 48 sprinklers

Duration of each sprinkler cycle: 4.0 minutes

Number of sprinkler pen runs/milking: 2 cycles/milking

Flow rate for each sprinkler head: 4.0 gallons/minute

Total sprinkler pen wastewater volume: 30,720 gallons/day

Total fresh water used in manure flush lane system(s): 0 gallons/day

**D. MISCELLANEOUS EQUIPMENT**

*No miscellaneous equipment entered.*

**E. MILKBARN AND EQUIPMENT SUMMARY**

Number of days in storage period: 120 days

Water available for reuse/recycle: 45,349 gallons/day

Recycled water reused: 38,220 gallons/day

Recycled water leaving system: 0 gallons/day

Reusable water balance: 7,129 gallons/day

Volume of milkbarn and equipment wastewater generated for storage period: 5,561,880 gallons/storage period

**MANURE AND BEDDING SOLIDS**

**A. IMPORTED AND FACILITY GENERATED BEDDING**

Bedding Type	Imported or Generated (tons)	Density (lbs/cu. ft.)	Applied Separation Efficiency (default)	Solids to Pond (cu. ft./period)
Facility generated bedding	315	40.0	50%	7,875
			Total:	7,875

**B. SOLIDS SEPARATION PROCESS**

Combined manure solids separation efficiency (weight basis): 40 %

Description of all solids separation equipment used in flushed lane manure management systems:

Mechanical Separator



**Waste Management Plan Report**  
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**C. MANURE AND BEDDING SOLIDS SUMMARY**

	cubic feet		gallons	
	day	storage period	day	storage period
Manure generated by the herd (pre-separation):	7,631.74	915,809	57,089.39	6,850,726
Manure generated by the herd sent to pond(s):	5,489.12	658,694	41,061.44	4,927,373
Manure generated by the herd sent to dry lot(s):	1,309.24	157,109	9,793.79	1,175,255
Manure solids (herd) removed by separation:	403.44	48,413	3,017.93	362,151
Liquid component in separated solids not sent to pond(s):	429.95	51,594	3,216.22	385,947
Imported and facility generated bedding sent to pond(s):	65.63	7,875	490.91	58,909
Total manure and bedding sent to pond(s):	5,554.74	666,569	41,552.35	4,986,282
Residual manure solids and bedding sent to pond(s) w/factor:	335.39	40,247	2,508.90	301,068
	cubic feet per year		gallons per year	
Residual manure solids and bedding sent to pond(s) w/factor:	122,418		915,749	

**RAINFALL AND RUNOFF**

**A. RAINFALL ESTIMATES**

Rainfall station nearest the facility: Merced

25 year/24 hour storm event (default NOAA Atlas 2, 1973): 2.50 inches/storage period

25 year/24 hour storm event (user-override):          inches/storage period

Storage period rainfall (default DWR climate data): 8.05 inches/storage period

Storage period rainfall (user-override):          inches/storage period

Flood zone: Zone A

**B. IMPERVIOUS AREAS**

Name	Surface Area (sq. ft.)	Quantity	25yr/24hr Storm Runoff Coefficient	Storage Period Runoff Coefficient	Runoff Destination
Impervious Area 1 - IA1	810	1	0.95	0.50	Drains into pond(s).
Impervious Area 2 - IA2	24,850	1	0.95	0.50	Drains into pond(s).
Impervious Area 3 - IA3	67,400	1	0.95	0.50	Drains into pond(s).
Impervious Area 4 - IA4	25,100	1	0.95	0.50	Drains into pond(s).
Manure Drying Pad	68,000	1	0.95	0.50	Drains into pond(s).

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Surface area that does not run off into pond(s): 0 sq. ft.

Surface area that runs off into pond(s): 186,160 sq. ft.

Total surface area: 186,160 sq. ft.

Runoff from normal storage period rainfall: 467,092 gallons/storage period

Runoff from normal storage period rainfall with 1.5 factor: 700,639 gallons/storage period

25 year/24 hour storm event runoff: 275,614 gallons/storage period

Total surface area runoff: 742,706 gallons/storage period

Total surface area runoff with 1.5 factor: 976,252 gallons/storage period

**C. ROOF AREAS**

Name	Surface Area (sq. ft.)	Quantity	Runoff Destination
Animal Shelter - AS1	130,425	1	Field
Animal Shelter - AS2	119,420	1	Field
Animal Shelter - AS3	27,600	1	Wastewater pond
Animal Shelter - AS4	4,700	1	Wastewater pond
Animal Shelter - AS5	6,000	1	Wastewater pond
Animal Shelter - AS6	4,510	1	Adjacent field
Animal Shelter - AS7	23,625	1	Wastewater pond
Commodity Barn	4,400	1	Wastewater pond
Milking Parlor	11,600	1	Wastewater pond
Shop	600	1	Wastewater pond

Surface area that does not run off into pond(s): 254,355 sq. ft.

Surface area that runs off into pond(s): 78,525 sq. ft.

Total surface area: 332,880 sq. ft.

Runoff from normal storage period rainfall: 394,053 gallons/storage period

Runoff from normal storage period rainfall with 1.5 factor: 591,079 gallons/storage period

25 year/24 hour storm event runoff: 122,377 gallons/storage period

Total surface area runoff: 516,429 gallons/storage period

Total surface area runoff with 1.5 factor: 713,456 gallons/storage period

**D. EARTHEN AREAS**

Name	Surface Area (sq. ft.)	Quantity	25yr/24 Storm Coefficient	Storage Period Coefficient	Runoff Destination
Earthen Area 1 - EA1	8,800	1	0.35	0.20	Drains into pond(s).
Earthen Area 2 - EA2	95,050	1	0.35	0.20	Drains into pond(s).
Earthen Area 3 - EA3	207,135	1	0.35	0.20	Drains into pond(s).
Earthen Area 4 - EA4	143,000	1	0.35	0.20	Drains into pond(s).

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Earthen Area 5 - EA5	107,800	1	0.35	0.20	Drains into pond(s).
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Surface area that does not run off into pond(s):	<u>0</u> sq. ft.
Surface area that runs off into pond(s):	<u>561,785</u> sq. ft.
Total surface area:	<u>561,785</u> sq. ft.
Runoff from normal storage period rainfall:	<u>563,828</u> gallons/storage period
Runoff from normal storage period rainfall with 1.5 factor:	<u>845,742</u> gallons/storage period
25 year/24 hour storm event runoff:	<u>306,428</u> gallons/storage period
Total surface area runoff:	<u>870,256</u> gallons/storage period
Total surface area runoff with 1.5 factor:	<u>1,152,170</u> gallons/storage period

**E. TAILWATER MANAGEMENT**

*No fields with tailwater entered.*

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LIQUID STORAGE

**A. POND OR BASIN DESCRIPTION:** WWS1

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions			
Earthen Length (EL):	<u>810</u> ft.	Earthen Depth (ED):	<u>23</u> ft.
Earthen Width (EW):	<u>180</u> ft.	Side Slope (S):	<u>1.7</u> ft. (h:1v)
Free Board (FB):	<u>2</u> ft.	Dead Storage Loss (DS):	<u>2.0</u> ft.
Calculations			
Liquid Length (LL):	<u>803</u> ft.	Storage Volume Adjusted for Dead Storage Loss:	<u>2,070,384</u> cu. ft.
Liquid Width (LW):	<u>173</u> ft.		
Pond Surface Area:	<u>145,800</u> sq. ft.	Pond Marker Elevation:	<u>20.1</u> ft.
Storage Volume:	<u>2,225,078</u> cu. ft.	Evaporation Volume:	<u>863,533</u> gals/period
		Adjusted Surface Area:	<u>137,631</u> sq. ft.

Potential storage losses (due to dead storage): 154,694.0 cubic feet - or - 1,157,191.5 gallons

Liquid storage surface area: 139,114 sq. ft.

Rainfall onto retention pond(s): 731,651 gallons/storage period

Rainfall runoff into retention pond(s): 1,424,973 gallons/storage period

Normal rainfall onto retention pond(s) with 1.5 factor: 1,097,476 gallons/storage period

Normal rainfall runoff into retention pond(s) with 1.5 factor: 2,137,459 gallons/storage period

Storage period evaporation (default): 13.42 inches/storage period

Storage period evaporation (user-override):            inches/storage period

Storage period evaporation volume: 863,533 gallons/storage period

Manure and bedding sent to pond(s): 4,986,282 gallons/storage period

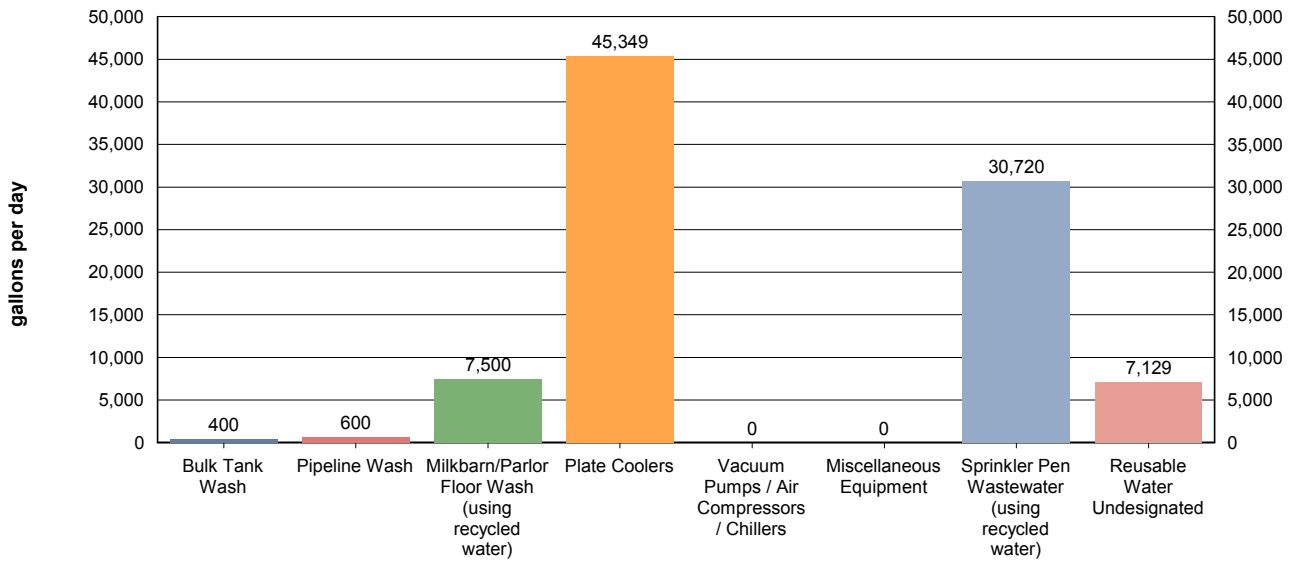
Milkbarn water sent to pond(s): 5,561,880 gallons/storage period

Fresh flush water for storage period: 0 gallons/storage period

**Waste Management Plan Report**  
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CHARTS

**A. MILKBARN WASTEWATER SENT TO POND(S)**



*Values shown in chart are approximate values per day.*

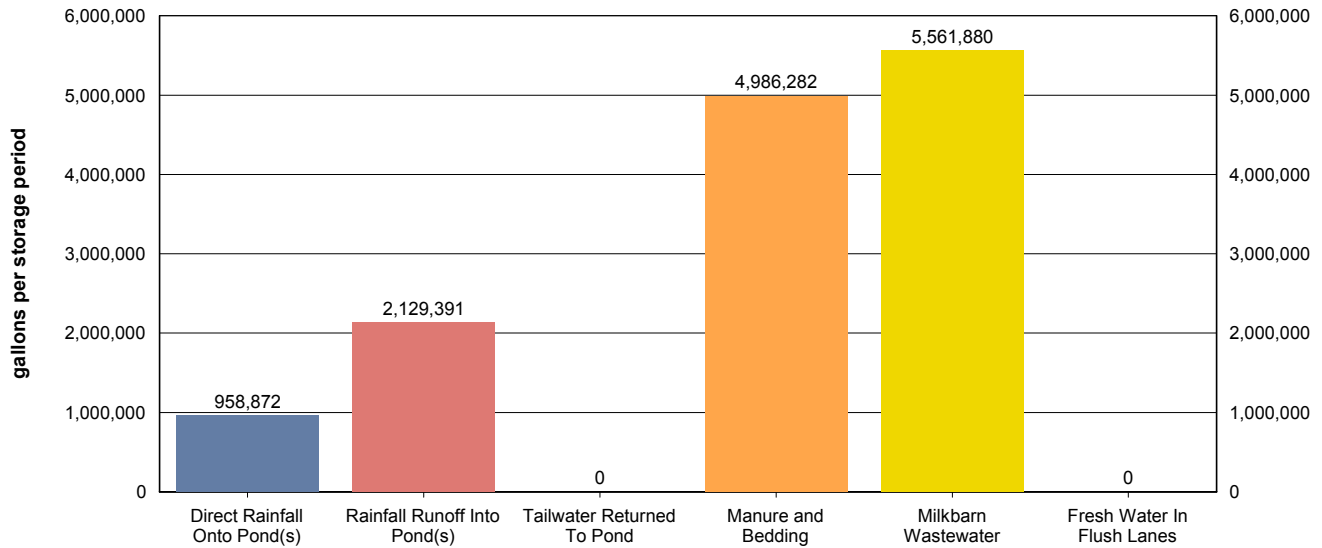
Total milkbarn wastewater generated daily: 46,349 gallons/day

Total milkbarn wastewater generated per period: 5,561,880 gallons/storage period



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**B. PROCESS WASTEWATER (NORMAL PRECIPITATION)**



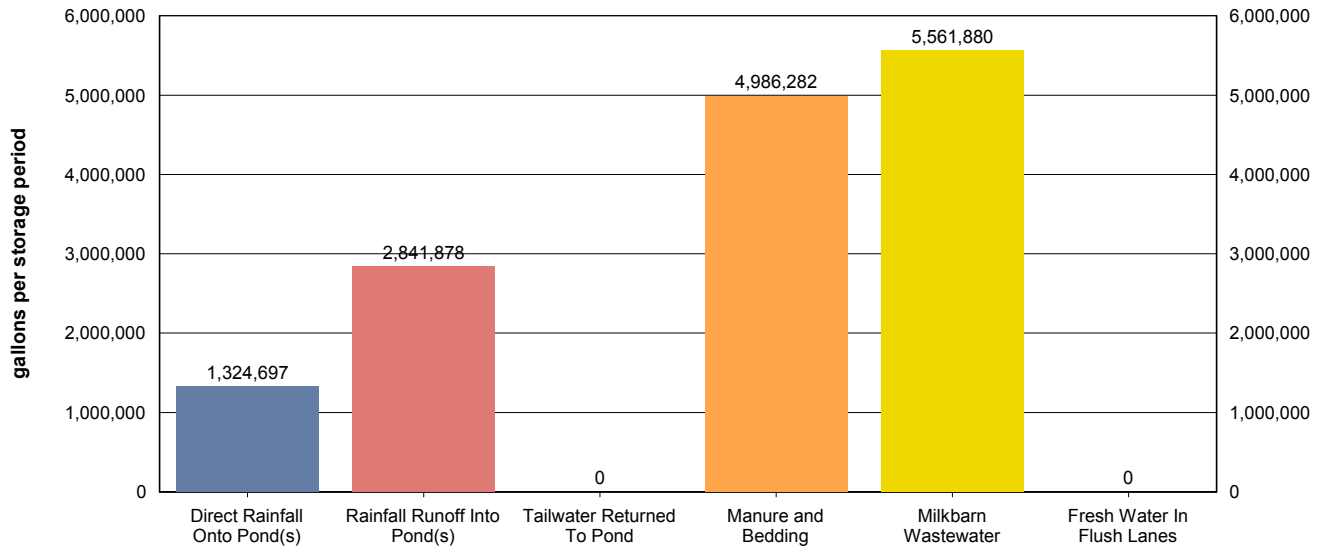
*Values shown in chart are approximate values for storage period.*

Storage period:	<u>120 days</u>
Total process wastewater generated daily:	<u>113,637 gallons/day</u>
Total process wastewater generated per period:	<u>13,636,425 gallons/storage period</u>
Total process wastewater removed due to evaporation:	<u>863,533 gallons/storage period</u>
Total storage capacity required:	<u>12,772,892 gallons</u>
	<u>1,707,487 cu. ft.</u>
Existing storage capacity (adjusted for dead storage loss):	<u>15,487,548 gallons</u>
	<u>2,070,384 cu. ft.</u>

**Considering normal precipitation, existing capacity meets estimated storage needs:**      ☒ Yes    ☐ No

**Waste Management Plan Report**  
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**C. PROCESS WASTEWATER (NORMAL PRECIPITATION WITH 1.5 FACTOR)**



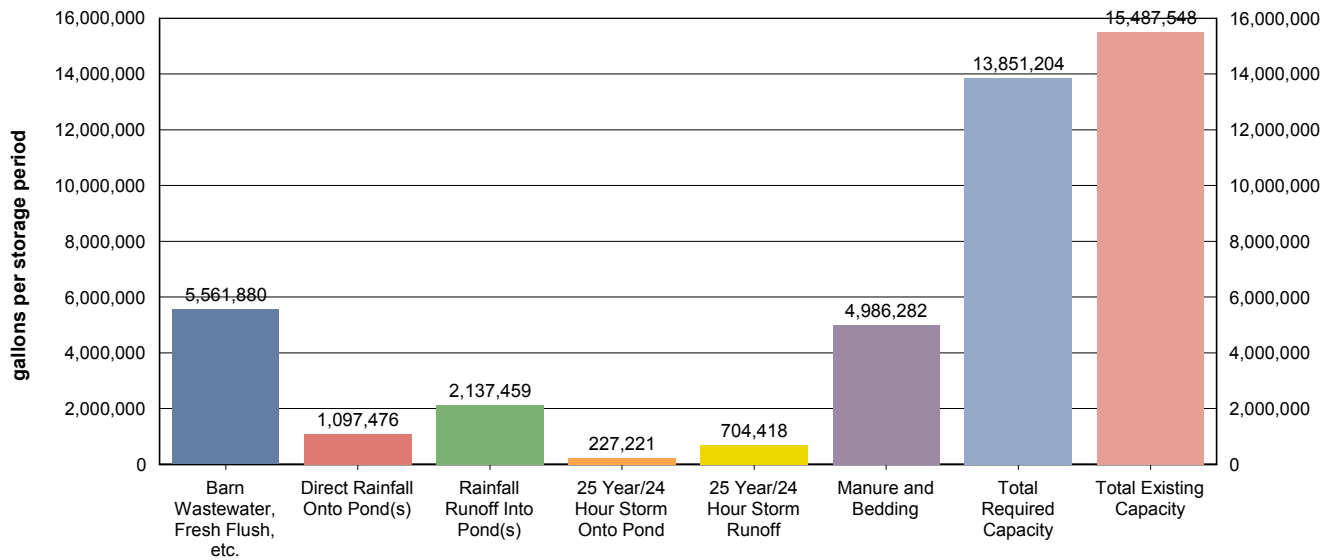
*Values shown in chart are approximate values for storage period.*

Storage period:	<u>120 days</u>
Total process wastewater generated daily:	<u>122,623 gallons/day</u>
Total process wastewater generated per period:	<u>14,714,737 gallons/storage period</u>
Total process wastewater removed due to evaporation:	<u>863,533 gallons/storage period</u>
Total storage capacity required:	<u>13,851,204 gallons</u>
	<u>1,851,637 cu. ft.</u>
Existing storage capacity (adjusted for dead storage loss):	<u>15,487,548 gallons</u>
	<u>2,070,384 cu. ft.</u>

**Considering factored precipitation, existing capacity meets estimated storage needs:**      ☒ Yes    ☐ No

**Waste Management Plan Report**  
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**D. STORAGE VOLUME ASSESSMENT (NORMAL PRECIPITATION WITH 1.5 FACTOR)**



*Values shown in chart are approximate values for storage period.*

Storage period:	120 days
Barn wastewater, fresh flush water, and tailwater:	5,561,880 gallons/storage period
Manure and bedding sent to pond:	4,986,282 gallons/storage period
Precipitation onto pond:	1,097,476 gallons/storage period
Precipitation runoff:	2,137,459 gallons/storage period
25 year/24 hour storm onto pond:	227,221 gallons/storage period
25 year/24 hour storm runoff:	704,418 gallons/storage period
Residual solids after liquids have been removed (liquid equivalent):	301,068 gallons/storage period
Total process wastewater removed due to evaporation:	863,533 gallons/storage period
Total required capacity:	13,851,204 gallons/storage period
Total existing capacity:	15,487,548 gallons/storage period
<b>Existing capacity meets estimated storage needs:</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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**OPERATION AND MAINTENANCE PLAN**

The goal of the Operation and Maintenance Plan is to eliminate discharges of waste or storm water to surface waters from the production area and the protection of underlying soils and ground water.

**A. POND MAINTENANCE**

**i. FREEBOARD MONITORING**

1. Freeboard will be monitored monthly from June 1 through September 1 (dry season) and weekly from October 1 through May 31 (wet season). The results will be recorded on a Dairy Production Area Visual Inspection Form.
2. Freeboard will be monitored during and after each significant storm event and the results recorded on a Production Area Significant Storm Event Inspection Form.
3. Ponds will be photographed on the first day of each month. Pond photos will be labeled and maintained with the dairy's monitoring records.

**ii. PREPARATION FOR MAINTAINING WINTER STORAGE CAPACITY**

1. The retention pond(s) will begin to be lowered to the minimum operating level on or before a designated date each year.
2. The minimum operating level will include the necessary storage volume as identified in Section II.A in Attachment B of the General Order.

**iii. OTHER POND MONITORING**

1. At the time of each monitoring for freeboard, the pond(s) will be inspected for evidence of excessive odors, mosquito breeding, algae, or equipment damage; and issues with berm integrity, including cracking, slumping, erosion, excess vegetation, animal burrows, and seepage. Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Other Pond Monitoring.
2. At the time of each monitoring during and after each significant storm event, the ponds will be inspected for evidence of any discharge and issues with berm integrity, including cracking, slumping, erosion, excess vegetation, animal burrows, and seepage. Any issues identified and corrective actions performed will be recorded on a Production Area Significant Storm Event Inspection Form.

**iv. SOLIDS REMOVAL PROCEDURES**

1. The average thickness of the solids accumulated on the bottom of the pond(s) will be measured on the designated interval using the owner, operator, and/or designer specified procedure.
2. Once solids/sludge on the bottom of the pond(s) reach the owner, operator, and/or designer specified critical thickness, solids/sludge will be removed so that adequate capacity is maintained.
3. When necessary, solids/sludge will be removed using the owner, operator, and/or designer specified methods for protecting any pond liner.

**OPERATIONS AND MAINTENANCE PLAN FOR POND: WWS1**

Dry season freeboard monitoring will occur on the 1st of each month.

Wet season freeboard monitoring will occur every Monday of each week.

Process wastewater pond contents will be lowered to the minimum operating level (elevation) of 2.0 feet above the pond invert beginning in March of each year.

Sludge accumulation will be measured annually.

The following method will be used to measure solids/sludge accumulation:

Solids will be measured with a probe/measuring rod/etc.

**Waste Management Plan Report**  
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When solids/sludge accumulate to a thickness of 2.0 feet, the following method will be used to maintain adequate storage capacity while protecting any pond liner:

Solids will be removed with an excavator.

**B. RAINFALL COLLECTION SYSTEM MAINTENANCE**

- i. Annually, rainfall collection systems will be assessed to ensure:
1. Conveyances are free of debris and operating within designer/manufacturer specifications.
  2. Components are properly fastened according to designer/manufacturer specifications.
  3. All downspouts and related infrastructure are connected to conveyances that divert water away from manured areas.
  4. Water from the rainfall collection system(s) is diverted to an appropriate destination.

<b><i>Buildings with rooftop rainfall collection systems</i></b>	<b>Quantity</b>	<b>Surface Area (sq. ft.)</b>
Animal Shelter - AS1	1	130,425
Animal Shelter - AS2	1	119,420
Animal Shelter - AS3	1	27,600
Animal Shelter - AS4	1	4,700
Animal Shelter - AS5	1	6,000
Animal Shelter - AS6	1	4,510
Animal Shelter - AS7	1	23,625
Commodity Barn	1	4,400
Milking Parlor	1	11,600
Shop	1	600

Assessment for buildings with rooftop rainfall collection systems will occur on or before: 1st of October

Assessment for other rainfall collections systems will occur on or before: 1st of October

Description of how rainfall collection systems will be assessed:

Gutters, downspouts, inlets, and drainage piping will be inspected for proper operation. Repairs will be made as needed prior to the rain season.

**C. CORRAL MAINTENANCE**



**Waste Management Plan Report**  
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- i. Monthly from June 1st through September 30th (dry season) and weekly from October 1st through May 31st (wet season), the perimeter of the corrals and pens will be assessed to ensure that runoff controls such as berms are functioning correctly, and that all water that contacts waste is collected and diverted into the wastewater retention pond (s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Corrals.
- ii. The corrals will be assessed by the designated date to determine:
  1. Whether manure needs to be removed from the corrals based on the owner, operator, and/or designer specified conditions.
  2. Whether there are depressions within the corrals that should be filled/groomed to prevent ponding.
- iii. Removal of manure and/or regrading, when necessary, will be completed on or before the designated month/day of each year.

Day of the month dry season assessment will occur: 1st of each month

Day of the week wet season assessment will occur: Monday

Solid manure removal and regrading assessment will occur on or before: 1st of October

Conditions requiring manure removal and/or regrading:

Solids will be removed with scrapers and/or loaders. Regrading will be performed as necessary after solids removal to ensure proper drainage.

Solid manure removal and/or regrading will occur on or before: 1st of November

**D. FEED STORAGE AREA MAINTENANCE**

- i. During the dry season and prior to the wet season, the perimeter of storage areas will be assessed to ensure all runoff controls such as berms are functioning correctly and runoff and leachate from the areas are collected and diverted into the wastewater pond(s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Manure and Feed Storage Areas.
- ii. During the wet season, feed storage area(s) will be assessed to determine if there are depressions within any feed storage area that should be filled or repaired to prevent ponding.
- iii. Any necessary regrading/resurfacing and berm/conveyance maintenance will be completed on an annual basis.

Day of the month dry season assessment will occur: 1st of each month

Day of the week wet season assessment will occur: Monday

Regrading/resurfacing and berm maintenance assessment will occur on or before: 1st of October

Regrading/resurfacing and berm maintenance completion will occur on or before: 1st of November

**E. SOLID MANURE STORAGE AREA MAINTENANCE**

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

- i. During the dry season and prior to the wet season, the perimeter of manure storage areas will be assessed to ensure all runoff and runoff controls such as berms are functioning correctly and runoff and leachate from the areas are collected and diverted into the wastewater pond(s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Manure and Feed Storage Areas.
- ii. During the wet season, manure storage area(s) will be assessed to determine if there are depressions within any manure storage area that should be filled to prevent ponding.
- iii. Any necessary regrading/resurfacing and berm/conveyance maintenance will be completed on an annual basis.

Day of the month dry season assessment will occur: 1st of each month

Day of the month wet season assessment will occur: Monday

Regrading/resurfacing and berm maintenance assessment will occur on or before: 1st of October

Regrading/resurfacing and berm maintenance completion will occur on or before: 1st of November

**F. ANIMAL HOUSING AND FLUSH WATER CONVEYANCE SYSTEM MAINTENANCE**

- i. A map will be attached that identifies critical points for monitoring the animal housing and flush water conveyance system to verify that water is being managed as identified in this Waste Management Plan. These points will be maintained at owner, operator, and/or designer specified intervals.

Animal housing area assessment will occur on or before: 1st of October

Animal housing drainage system maintenance will occur on or before: 1st of October

Animal housing area drainage system assessment and maintenance methods:

Animal housing drainage systems will be inspected for proper operation. Repairs will be made as soon as possible after identification of damaged facilities.

**G. MORTALITY MANAGEMENT**

- i. Dead animals will be stored, removed, and disposed of properly.

Rendering company or landfill name: Darling International

Rendering company or landfill telephone number: (559) 268-5325

**H. ANIMALS AND SURFACE WATER MANAGEMENT**

- i. A system will be in place, monitored, and maintained to prevent animals from entering any surface waters when a stream or other surface water crosses or adjoins the corral(s).

Does a stream or any other surface water cross or adjoin the corrals? ☐ Yes ☒ No

**I. MONITORING SALT IN ANIMAL RATIONS**

- i. The combined quantity of minerals as salt in animal drinking water and feed rations will be reviewed by a qualified nutritionist on a routine basis to verify that minerals are limited to the amount required to maintain animal health and optimum production. As feed rations change, mineral content may change.

Assessment interval: Annually

**J. CHEMICAL MANAGEMENT**

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

- i. Chemicals and other contaminants handled at the facility will not be disposed of in any manure or process wastewater, storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.

Chemical Name	Quantity	Units	Frequency	Usage Area	Destination (Used Chemical / Container)	Disposal Company		Collection Frequency
						Name	Phone	
Acid	360	gallons	year	Milking parlor	Picked up by distributor			
Chlorine	360	gallons	year	Milking parlor	Picked up by distributor			
Iodine	3,000	gallons	year	Milking parlor	Picked up by distributor			
CIP Detergent	360	gallons	year	Milking parlor	Picked up by distributor			

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

**REQUIRED ATTACHMENTS**

The following list, based upon user selections and data entries, describes the minimum required attachments that must be submitted with the Waste Management Plan for the reporting schedule of 'July 1, 2010'.

**A. SITE MAP(S)**

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of the production area including the following in sufficient detail: structures used for animal housing, milk parlor, and other buildings; corrals and ponds; solids separation facilities (settling basins or mechanical separators); other areas where animal wastes are deposited or stored; feed storage areas; drainage flow directions and nearby surface waters; all water supply wells (domestic, irrigation, and barn wells) and groundwater monitoring wells.

Production area map reference number: Exhibit Sheets 3 & 4

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) including the following in sufficient detail: a field identification system (Assessor's Parcel Number; field by name or number; total acreage of each field; crops grown; indication if each field is owned, leased, or used pursuant to a formal agreement); indication of what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field.

Application area map reference number: Exhibits Sheet 2

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of all cropland (land that is part of the dairy but not used for dairy waste application) including the following in sufficient detail: Assessor's Parcel Number, total acreage, crops grown, and information on who owns or leases the field. The Waste Management Plan shall indicate if such cropland is covered under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger, or updates thereto).

Non-application area map reference number: n/a

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of all off-property domestic wells within 600 feet of the production area or land application area(s) associated with the dairy and the location of all municipal supply wells within 1,500 feet of the production area or land application area(s) associated with the dairy.

Well area map reference number: Exhibit Sheets 2,3,4

Provide a site map (or maps) of appropriate scale to show property boundaries and a vicinity map, north arrow and the date the map was prepared. The map shall be drawn on a published base map (e.g., a topographic map or aerial photo) using an appropriate scale that shows sufficient details of all facilities.

Vicinity map reference number: Exhibit Sheet 1

**B. PROCESS WASTEWATER MAP(S)**

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of the production area including the following in sufficient detail: process wastewater conveyance structures, discharge points, and discharge /mixing points with irrigation water supplies; pumping facilities and flow meter locations; upstream diversion structures, drainage ditches and canals, culverts, drainage controls (berms/levees, etc.), and drainage easements; and any additional components of the waste handling and storage system.

Production infrastructure system area map reference number: Exhibit Sheets 2,3,4

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) including the following in sufficient detail: process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.

Land application infrastructure system area map reference number: Exhibit Sheets 2,3,4

**C. EXCESS PRECIPITATION CONTINGENCY REPORT**

*There were no attachment references entered or required for this attachment section.*

**D. OPERATION AND MAINTENANCE PLAN**

Attach a map that identifies critical points for monitoring the system to verify that water is being managed as identified in this Waste Management Plan (see Attachment B, Pg B-7 V.F, V.G, and V.H for additional requirements).

Animal housing assessment map reference number: Exhibit Sheet 3

**E. FLOOD PROTECTION / INUNDATION REPORT**

Provide an engineering report showing that the facility has adequate flood protection.

Flood zone map and/or document reference number: WMP Section 3.b.

**F. BACKFLOW PROTECTION**

Attach documentation from a trained professional (i.e. a person certified by the American Backflow Prevention Association, an inspector from a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training), as specified in Required Reports and Notices H.1 of Waste Discharge Requirements General Order No. R5-2007-0035, that there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the Site Map.

Backflow documentation reference number: WMP Section 1.b.



**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

CERTIFICATION

**A. DAIRY FACILITY INFORMATION**

Name of dairy or business operating the dairy: Azevedo Dairy #2

Physical address of dairy:

7618 Highway 59

El Nido

Merced

95317

Number and Street

City

County

Zip Code

Street and nearest cross street (if no address): \_\_\_\_\_

**B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT**

*I have reviewed the portion of the waste management plan that is related to storage capacity facility and design specifications in accordance with Item II, Attachment B of the Waste Discharge Requirements General Order for Existing Milk Cow Dairies - Order No. R5-2007-0035 and certify that this plan was prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work.*

Storage capacity is:

Insufficient

- ☐ Retrofitting Plan/Schedule/Design Criteria attached in accordance with Attachment B, II.B. 1-5 and Attachment B, II. C.

Sufficient

- ☒ Certification 1 - Certified in accordance with Attachment B, II. A. 1-8. (no contingency plan)
- ☐ Certification 2 - Certified in accordance with Attachment B, II. A. 1-8, II. C. (with contingency plan attached)



CIVIL ENGINEER'S WET STAMP

*Manuel R. Sousa*

12/7/2020

SIGNATURE OF CIVIL ENGINEER

DATE

Manny Sousa

PRINT OR TYPE NAME

P.O. Box 1613; Oakdale, CA 95361

MAILING ADDRESS

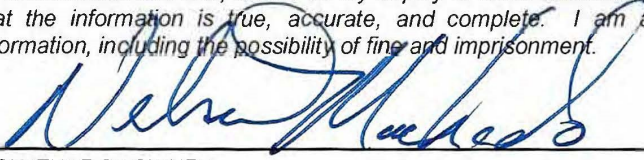
(209) 238-3151

PHONE NUMBER

**Waste Management Plan Report**  
General Order No. R5-2007-0035, Attachment B  
July 1, 2010 deadline

**C. OWNER AND/OR OPERATOR CERTIFICATION**

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*



SIGNATURE OF OWNER

SIGNATURE OF OPERATOR

Antonio Azevedo

PRINT OR TYPE NAME

PRINT OR TYPE NAME

12/7/2020

DATE

DATE



**Sousa**  
**ENGINEERING**  
INFRASTRUCTURE-DEVELOPMENT-  
AGRICULTURE

PO BOX 1613  
OAKDALE, CA 95361  
PHONE: (209)238-3151  
www.sousaeng.com

**FLOOD PROTECTON ANALYSIS  
FOR  
ANTONIO AZEVEDO DAIRY #2  
MERCED COUNTY, CA**

**TABLE OF CONTENTS**

1. Introduction / Project Overview
2. Determination of Base Flood Elevation (BFE)
3. Determination of Elevations of Existing Dairy Production Area and Proposed Expansion Area within FEMA Zone A
4. Determination of Levels of Flood Protection and Inundation / Conceptual Flood Protection Plan
5. Exhibits
  - a. Vicinity Map
  - b. FIRM Panel No. 06047C0675G
  - c. Estimated 100-Year Base Flood Elevation
  - d. Existing Topography – Existing Improvements
  - e. Conceptual Grading and Flood Protection Plan



## INTRODUCTION / PROJECT OVERVIEW

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This analysis has been prepared to accompany a Waste Management Plan (WMP) for the Antonio Azevedo #2 dairy facility in Merced County, CA. A WMP describing the generation and management of dairy wastewater must be prepared in accordance with Merced County and Central Valley Regional Water Quality Control Board (CVRWQCB) requirements. CVRWQCB General Order No. R5-20013-0122, *Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies*, (Order) was adopted by the California Regional Water Quality Control Board (CRWQCB) Central Valley Region in 2013 and establishes the criteria for preparation of the WMP.

Per the requirements set forth by the Order, each existing milk cow dairy in the Central Valley Region located in an area subject to inundation from the prescribed flood event must have or must construct improvements that provide protection from that flood event. More particularly the Order states the following:

**General Specification B.2:** *“In the Sacramento and San Joaquin River Basins, ponds and manured areas at existing milk cow dairies in operation on or before 27 November 1984 shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Existing milk cow dairies that were in operation on or before 27 November 1984 and that are protected against 100-year peak stream flows must continue to provide such protection.*

*Existing milk cow dairies built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows (Title 27 Section 22562(c)).”*

This facility was built after November 27, 1984, thus it will be required to provide protection against 100-year peak stream flows.

The above referenced section of Title 27 (Section 22562 of Chapter 7, Subchapter 2) also states the following criterion in its item (3):

*“The determination of peak stream flows shall be from data provided by a recognized federal, state, local, or other agency.”*

The source of flood information for this analysis is Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) Flood Insurance Studies (FISs). FIRMs and FISs are industry standard sources of flood information for engineers, scientists, lending institutions, and other industries with a vested interest in the location of real property as it relates to areas subject to flood inundation.

The entire Antonio Azevedo Dairy #2 lies within a FEMA Zone A, or an area determined to be subject to inundation by the 100-year flood event. It is the intent of this analysis to do the following:

1. Determine a Base Flood Elevation (BFE) for the portion of the site located with the FEMA Zone A.
2. Determine the elevations of existing Dairy Production Area (DPA) improvements relative to the determined BFE.
  - a. If the DPA is currently protected from inundation by the design storm event, then the extent of this protection will be demonstrated.
  - b. If the DPA is not protected from inundation by the design storm event, then the extent of

inundation will be demonstrated.

3. If portions of the existing and proposed DPA are determined not to be protected from the design storm event by existing conditions, then a plan for constructing improvements to provide adequate protection will be developed.

Neither this analysis nor any of the information contained herein represent a certificate of elevation or Letter of Map Revision or Amendment (LOMR / LOMA) for the project site.



## **DETERMINATION OF BASE FLOOD ELEVATION (BFE)**

---

The entire subject Dairy Production Area (DPA) is in Zone A per the relevant FIRM. Zone A is defined as an area subject to inundation by the 100-year storm event but for which a Base Flood Elevation (BFE) has not been established. The location of the DPA is shown on the FIRM on the attached Exhibit B.

The hydrologic analysis used to determine the boundary of Zone A in these cases typically has been performed utilizing topographic information available on quadrangle maps prepared by the United States Geological Survey (USGS). The method of determining an estimated flood elevation for Zone A sites as recommended by FEMA is to superimpose the Zone A boundary defined by the FIRM over the relevant USGS quadrangle map and interpolate the elevation along said Zone A boundary (see *Managing Floodplain Development in Approximate Zone A Areas*, Federal Emergency Management Agency, April, 1995).

Combining the aforementioned method with current technology in an effort to create a flood plain model that is as accurate as possible given the available information, three dimensional models of the existing topography and of the water surface have been created from which to estimate the BFE for the project site. The method utilized is based on the methods described in *Managing Floodplain Development in Approximate Zone A Areas*, Federal Emergency Management Agency, and, is particularly described in *Base Flood Elevation Determination Module*, Federal Emergency Management Agency, June, 2003, prepared by Nolte Associates, Inc.

The FIRM was digitally superimposed over the relevant USGS quadrangle map for the project site. The 10' contours on the quadrangle map were digitized and a three-dimensional model of the existing terrain was generated. Three-dimensional feature lines along the Zone A boundary were then created and elevations from the existing terrain surface were sampled along those feature lines at the Zone A boundary.

For this Zone A area, the Zone A boundary represents the outer edge of the floodplain at its northern and southern extents (see Exhibit Sheet C, Estimated 100-year Base Flood Elevation. Thus, the sampled elevations on the feature lines represent the floodplain elevation at its outer edge in these northern and southern locations. However, at other locations the Zone A boundary meets the boundary of a AO zones with depths between 1' and 3', AE zones with determined Base Flood Elevations, and an AH zone with a determined Base Flood Elevation. Where the Zone A boundary meets these other zones, the sampled elevations of the existing terrain surface along the boundary were adjusted upward 1' to 3' along the AO zones and adjusted to match the BFE along the AH and AE zones to correspond to the flood depth at those locations.

After creation of accurate feature lines using the methods described above, a three-dimensional surface of the flood plain was then created from said features lines thus allowing for observation of the estimated BFE on the project site. The elevations and contours of the flood plain are shown on Exhibit C, Estimated 100-Year Base Flood Elevation. As indicated on Exhibit C the estimated flood elevation in the vicinity of the DPA increases from approximately 144' at the west boundary to 146' at the east boundary of the facility.

## **DETERMINATION OF ELEVATIONS OF EXISTING DAIRY PRODUCTION AREA**

An engineering survey was performed in to determine the actual existing elevations of facilities within the DPA relative to the estimated flood elevation. USGS benchmarks were used to establish elevations based on the datum corresponding to that of the quadrangle map relevant to the project site. The elevations shown on the quadrangle map are based on the North American Vertical Datum of 1988 (NAVD88). A three-dimensional model of the existing terrain was generated using the engineering survey performed on the existing DPA improvements to compare actual elevations to those of the estimated flood elevation. Contours of that model are shown on Exhibit D, Existing Topography – Existing Improvements.

It is apparent upon visual inspection that the DPA was raised significantly above existing grade during construction. Portions of the facility were raised approximately 4' and this was verified by the survey data. As shown on Exhibit D, Existing Topography – Existing Improvements, the elevations of most of the DPA within the Flood Zone Boundary are consistently above the estimated flood elevation and range from 144' to 147'. These areas are outlined in red on Exhibit D.

Portions of the DPA have elevations that are slightly lower than the estimated BFE and would be subject to inundation levels of approximately 1' or less. These areas are the eastern portions of the corrals, eastern portions of the two largest animal housing structures, and the feed storage area. These areas are outlined in blue on Exhibit D.

## **DETERMINATION OF LEVELS OF FLOOD PROTECTION AND INUNDATION / CONCEPTUAL FLOOD PROTECTION PLAN**

As discussed in the previous section the elevations of most of the DPA within the Flood Zone Boundary are consistently above the estimated flood elevation and range from 144' to 147'. These areas are outlined in red on Exhibit D.

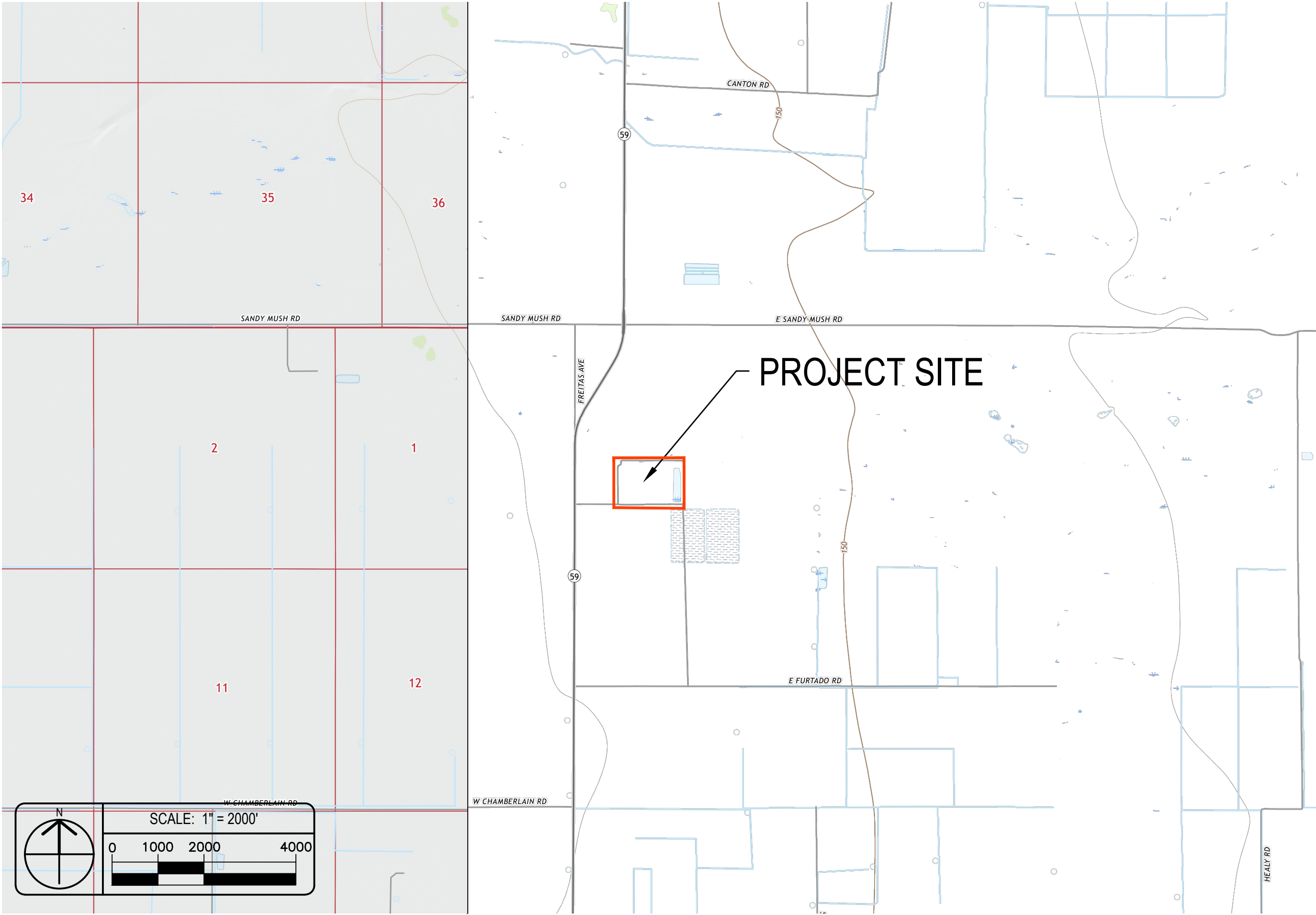
The areas described in the previous section that would be subject to inundation levels of approximately 1' or less based on the estimated BFE can be improved to provide sufficient flood protection. The following are suggested improvements for these areas:

- 1. Eastern portions of corrals, eastern portions of the two largest animal housing structures, and feed storage area:** the existing access roads on the north and south edges of the DPA can be raised slightly to finished grades between 145' and 146 as shown on Exhibit E, Conceptual Grading and Flood Protection Plan;

With the suggested improvements described above, or similar improvements that would provide the required flood protection, this dairy would meet the requirements of General Specification B.2. of the General Order for flood protection.


## **EXHIBITS**

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DRAWN BY: MS		
DATE: 2/12/2020		
FILE: 01_vic.dwg		
JOB NO.: 2019-039		
SYMBOL	REVISIONS	APPROD.
	DESCRIPTION	

EXHIBIT A  
VICINITY MAP  
ANTONIO AZEVEDO DAIRY #2  
MERCED COUNTY, CA



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# National Flood Hazard Layer FIRMette



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **3/10/2020 at 8:25:16 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

37°10'46.70"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

37°10'18.04"N



THREE DIMENSIONAL ELEVATION MAP, TYPICAL

Map labels include:

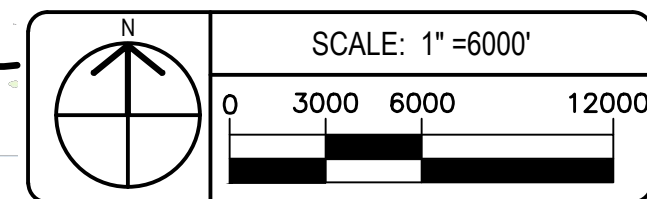
- ZONE X
- ZONE AE
- ZONE A
- ZONE AO 1'
- ZONE AO 2'
- ZONE AO 3'
- ZONE AH EL 153
- ZONE A
- DAIRY PRODUCTION AREA
- ZONE A BOUNDARY PER FEMA FIRM SUPERIMPOSED OVER QUADRANGLE MAP

Elevation contours are marked with values: 125, 130, 135, 140, 145, 150, 155.

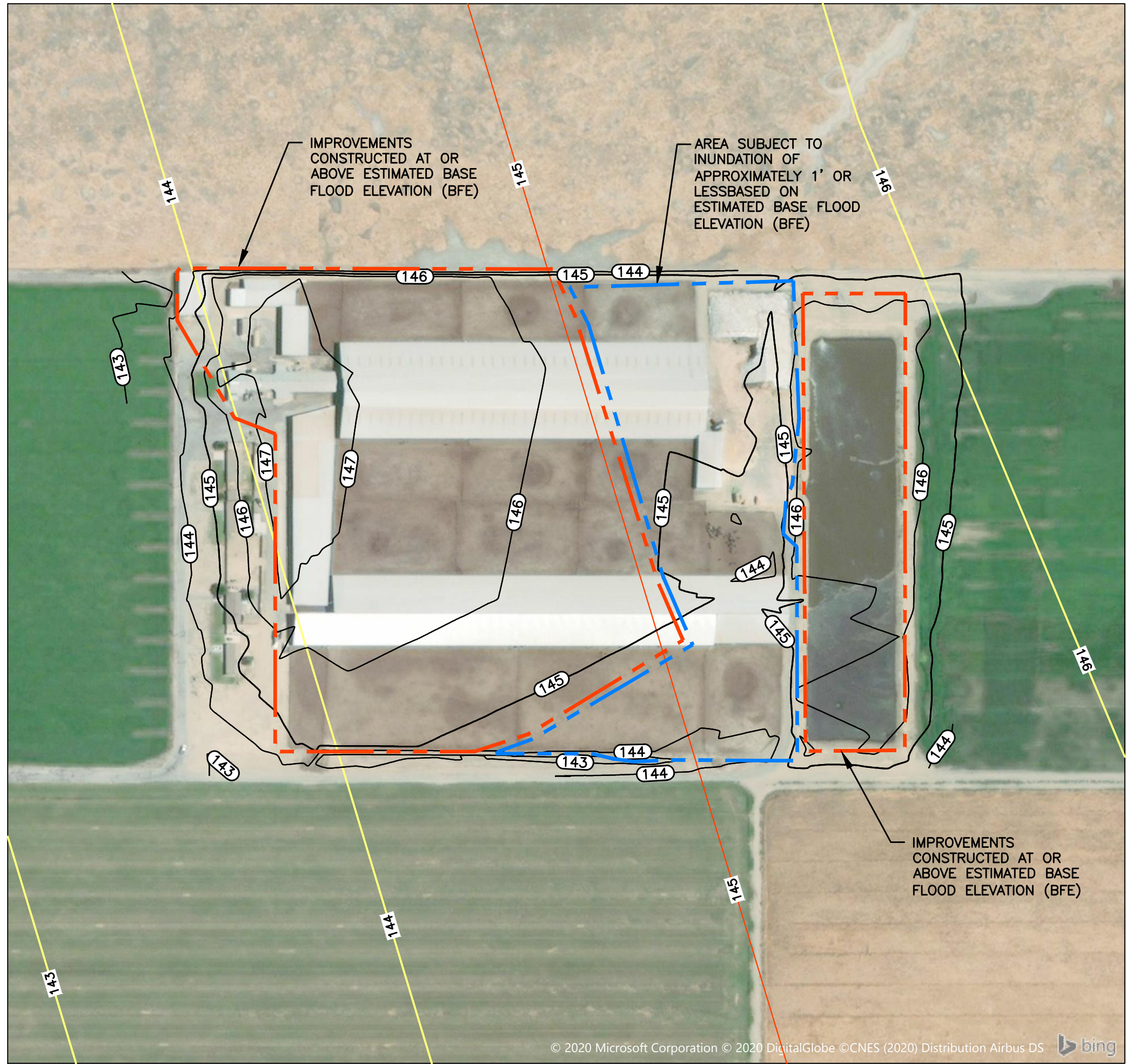
Geographical features include the Merced River, Merced National Wildlife Refuge, and various roads (e.g., W CHAMBERLAIN RD, W CHAMBERLAIN RD, W CHAMBERLAIN RD).

Map of the Merced River floodplain showing FEMA Flood Insurance Rate Maps (FIRM) and a superimposed Zone A boundary. The map includes labels for various flood zones (ZONE AO 1', ZONE AO 2', ZONE AO 3', ZONE AH EL 153, ZONE A), a DAIRY PRODUCTION AREA, and a ZONE A BOUNDARY PER FEMA FIRM SUPERIMPOSED OVER QUADRANGLE MAP. The map also shows the GRASSLANDS WILDLIFE MANAGEMENT AREA and the MERCED NATIONAL WILDLIFE REFUGE. The map is overlaid with a grid of latitude and longitude coordinates.

## CONTOUR AND ELEVATION BASED ON FLOOD PLAIN MODEL

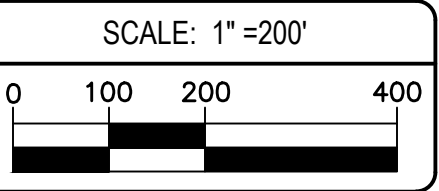
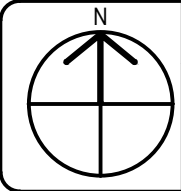






LEGEND

- CONTOUR OF THREE-DIMENSIONAL MODEL OF EXISTING SITE IMPROVEMENTS
- IMPROVEMENTS CONSTRUCTED ABOVE ESTIMATED BASE FLOOD ELEVATION (BFE)
- AREA SUBJECT TO INUNDATION OF APPROXIMATELY 1' OR LESS BASED ON ESTIMATED BASE FLOOD ELEVATION (BFE)
- CONTOUR AND ELEVATION BASED ON FLOOD PLAIN MODEL



SHEET 4 OF 5

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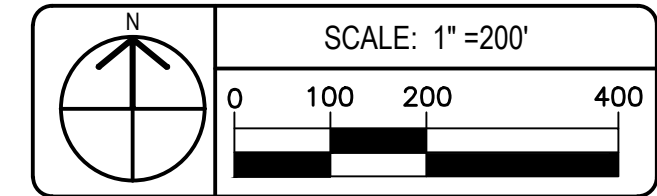
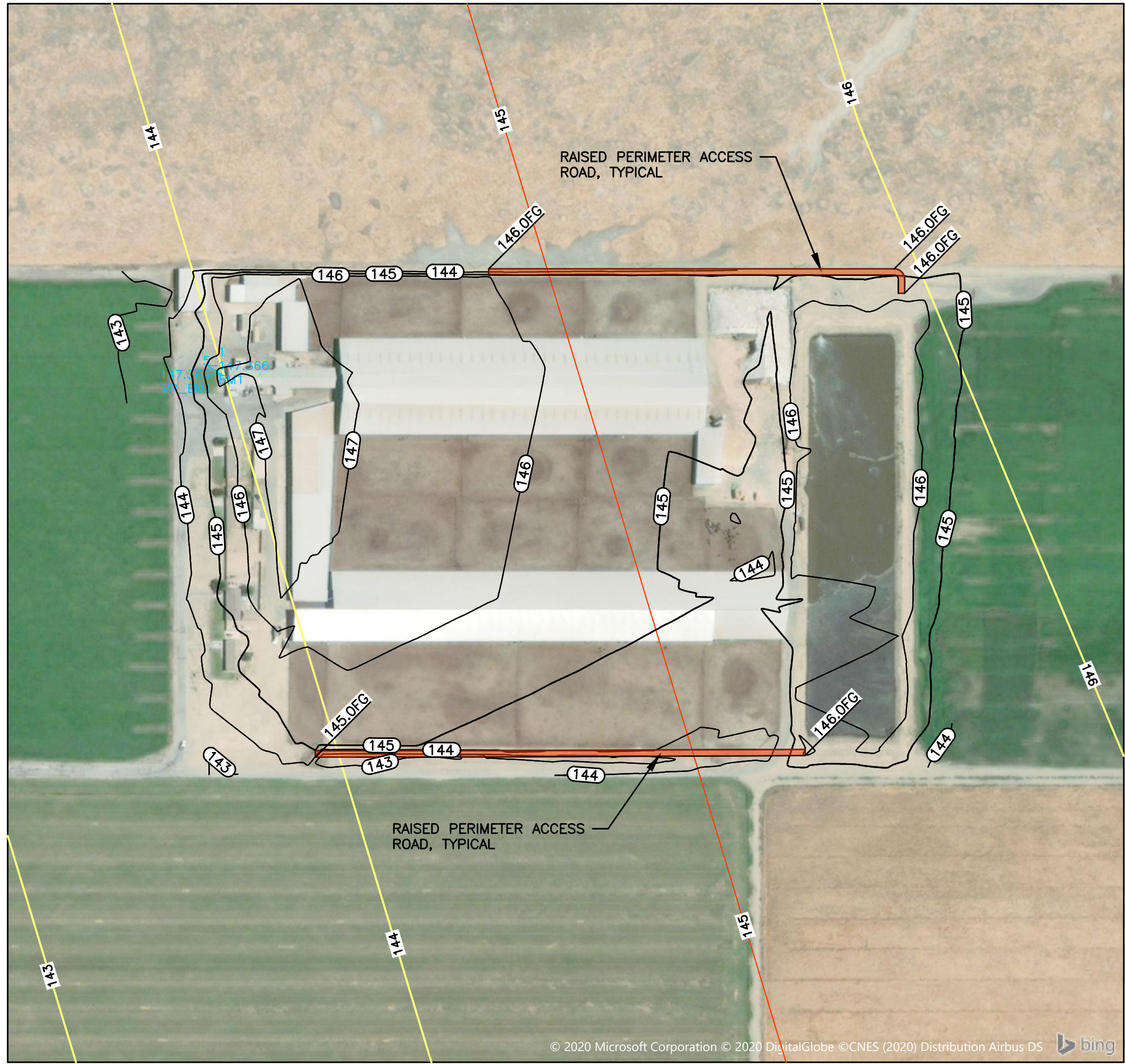
EXHIBIT D  
EXISTING TOPOGRAPHY -  
EXISTING IMPROVEMENTS  
ANTONIO AZEVEDO DAIRY #2

MERCED COUNTY, CA

SYMBOL	REVISIONS		APPROVED
	DESCRIPTION	DATE	

DRAWN BY: MS  
DATE: 2/12/2020  
FILE: 04\_survey.dwg  
JOB NO.: 2019-039





- LEGEND**
- CONTOUR OF THREE-DIMENSIONAL MODEL OF EXISTING SITE IMPROVEMENTS
  - CONTOUR AND ELEVATION BASED ON FLOOD PLAIN MODEL
  - PROPOSED RAISED PERIMETER BERM, ACCESS ROAD, OR EMBANKMENT
  - PROPOSED FINISHED GRADE ELEVATION

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DATE: 2/12/2020	DESCRIPTION	
FILE: 05_grad.dwg		
JOB NO.: 2019-039		

EXHIBIT E  
CONCEPTUAL GRADING AND  
FLOOD PROTECTION PLAN  
ANTONIO AZEVEDO DAIRY #2

MERCED COUNTY, CA



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**VECTOR CONTROL PLAN  
FOR  
AZEVEDO DAIRY #2  
MERCED COUNTY, CA**

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## 1. INTRODUCTION

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Vector control is an important aspect of disease prevention and public health. Without proper management, agricultural production facilities can create or enhance opportunities for vectors to develop and proliferate. Certain land management practices can reduce vector populations thereby reducing long-term vector treatment costs, reducing the amount of pesticides used in vector control operations, helping to protect public health, and contributing to an integrated pest management (IPM) approach to vector control.

Integrated Pest Management is an approach that focuses on site-specific, scientifically sound decisions to manage pest populations by matching a wide variety of techniques with the conditions found on site. These techniques are commonly grouped into four categories:

1. Source reduction or physical control—environmental manipulation that results in a reduction of vector development sites.
2. Biological Control—use of biological agents to limit vector populations
3. Chemical Control—larvicides (materials that kill immature larval vectors and mosquitoes) and adulticides (materials that kill adult vectors and mosquitoes)
4. Cultural Control—change the behavior of people so that their actions prevent the development of vectors or the transmission of vector-borne disease.

Through the adoption of these policies and procedures, this Plan will provide an outline to effectively control vectors by physical, cultural, and biological means.

The Vector Reduction Best Management Practices (BMPs) referred to in this document are the recommended land management practices that can provide a reduction in vector populations by various means including: reducing or eliminating breeding areas, increasing the efficacy of biological controls, increasing the efficacy of chemical controls, and improving access for control operations.

While it is generally accepted that vector production from all sources may be reduced through the widespread implementation of vector Reduction BMPs, these policies specifically target the most severe vector problems with the greatest likelihood of responding through the use of BMPs.



## 2. **BEST MANAGEMENT PRACTICES (BMPs)**

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- a. **Land Application Areas:** for Land Application Areas, the following are areas of concern and recommended BMPs for vector control:

### Common Vector Development Areas

- Vegetated ditches
- Seepage or flooding of fallow fields
- Irrigation tail water return sumps
- Blocked ditches or culverts
- Leaky water control structures
- Irrigated pastures
- Low areas caused by improper grading
- Broken or leaky irrigation pipes or valves

### Special Concerns

Agricultural practices vary among growers, locations, and conventional or organic production methods. Pesticide regulations can affect the ability to use chemical control. The Best Management Practices below are offered as tools to balance the economic and agronomic requirements of the growers and land owners with the need for effective vector control.

### General Vector Reduction Principles

1. Prevent or eliminate unnecessary standing water that stands for more than 72 –96 hours during mosquito season which can start as early as March and extend through October depending on weather.
2. Maintain access for Abatement District staff to monitor and treat mosquito breeding sources.
3. Minimize emergent vegetation and surface debris on the water.
4. Contact the County Department of Environmental Health or Mosquito Abatement District for technical guidance or assistance in implementing vector reduction BMPs.

### **Vector Reduction BMPs for Land Application Areas**

#### Ditches and Drains

- DD-1** Construct or improve ditches with at least 2:1 slopes and a minimum 4-foot bottom. Consider a 3:1 slope or greater to discourage burrowing animal damage, potential seepage problems, and prevent unwanted vegetation growth. Other designs may be approved by the MVCD based on special circumstances.
- DD-2** Keep ditches clean and well-maintained. Periodically remove accumulated sediment and vegetation. Maintain ditch grade to prevent areas of standing water.



**DD-3** Design irrigation systems to use water efficiently and drain completely to avoid standing water.

#### Irrigated Pastures

- IP-1** Grade field to achieve efficient use of irrigation water. Use NRCS guidelines for irrigated pastures. Initial laser leveling and periodic maintenance to repair damaged areas are needed to maintain efficient water flow.
- IP-2** Irrigate only as frequently as is needed to maintain proper soil moisture. Check soil moisture regularly until you know how your pasture behaves
- IP-3** Do not over fertilize. Excess fertilizers can leach into irrigation tail water, making mosquito production more likely in ditches or further downstream
- IP-4** Apply only enough water to wet the soil to the depth of rooting.
- IP-5** Drain excess water from the pasture within 24 hours following each irrigation. This prevents scalding and reduces the number of weeds in the pasture. good check slopes are needed to achieve drainage. A drainage ditch may be used to remove water from the lower end of the field.
- IP-6** Inspect fields for drainage and broken checks to see whether re-leveling or reconstruction of levees is needed. Small low areas that hold water can be filled and replanted by hand. Broken checks create cross-leakage that provide habitat for vectors.
- IP-7** Keep animals off the pasture while the soil is soft. An ideal mosquito habitat is created in irrigated pastures when water collects in hoof prints of livestock that were run on wet fields or left in the field during irrigation. Keeping animals off wet fields until soils stiffen also protects the roots of the forage crop and prevents soil compaction that interferes with plant growth.
- IP-8** Break up pastures into smaller fields so that the animals can be rotated from one field to another. This allows fields to dry between irrigations and provides a sufficient growth period between grazings. It also prevents hoof damage (pugging), increases production from irrigated pastures, and helps improve water penetration into the soil by promoting a better root system.

- b. Dairy Production Area (DPA):** for the Dairy Production Area, the following are areas of concern and recommended BMPs for vector control:

#### Common Vector Development Areas

- Wastewater lagoons
- Animal washing areas

- Drain ditches
- Sumps/ponds
- Watering troughs

#### Special Concerns

Dairy and associated agricultural practices vary; however, these practices need to consider mosquito and vector control issues. The Best Management Practices for Vector Reduction below offer options to balance the requirements of the dairy operators with the need for effective vector control.

#### General Vector Control Principles

1. Prevent or eliminate unnecessary standing water that remains for more than 72 –96 hours during mosquito season which can start as early as March and extend through October depending on weather.
2. Maintain access for Abatement District staff to monitor and treat mosquito breeding sources.
3. Minimize emergent vegetation and surface debris on the water.
4. Contact the County Department of Environmental Health or Mosquito Abatement District for technical guidance or assistance in implementing vector reduction BMPs.

#### **Vector Reduction BMPs for Dairy Production Area**

- DA-1 All holding ponds should be surrounded by lanes of adequate width to allow safe passage of vector control equipment. This includes keeping the lanes clear of any materials or equipment (e.g. trees, calf pens, hay stacks, silage, tires, equipment, etc.).
- DA-2 If fencing is used around the holding ponds, it should be placed on the outside of the lanes with gates provided for vehicle access.
- DA-3 It is recommended that all interior banks of the holding ponds should have a grade of at least 2:1.
- DA-4 An effective solids separation system should be utilized such as a mechanical separator or two or more solids separator ponds. If ponds are used, they should not exceed sixty feet in surface width.
- DA-5 Drainage lines should not by-pass the separator ponds whenever possible, except those that provide for normal corral run-off and do not contain solids. All drain inlets must be sufficiently graded to prevent solids accumulation.
- DA-6 Floating debris should be minimized in all ponds; mechanical agitators may be used to break up crusts.

- DA-7 Vegetation should be controlled regularly to prevent emergent vegetation and barriers to access. This includes access lanes, interior pond embankments and any weed growth that might become established within the pond surface.
- DA-8 Dairy wastewater discharged for irrigation purposes should be managed so that it does not stand for more than three days.
- DA-9 All structures and water management practices should meet current California Regional Water Quality Control Board requirements.
- DA-10 Tire sidewalls or other objects that will not hold water should be used to hold down tarps (e.g. on silage piles). Whole tires or other water-holding objects should be replaced.

### **3. CONTACT INFORMATION**

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