

INFORMATION SHEET

ORDER NO. R5-2007-_____
SIERRA NEVADA CHEESE COMPANY, INC. AND
GREGERSEN PROPERTIES LLC
CHEESE PRODUCTION FACILITY
GLENN COUNTY

INTRODUCTION

Sierra Nevada Cheese Company, Inc. and Gregersen Properties LLC (hereafter Discharger) own and operate a cheese production facility (Facility) on County Road 39, four miles north of the City of Willows and one mile east of Interstate 5. The Discharger manufactures small quantities of cheese and lesser amounts of yogurt, sour cream, and butter.

The Discharger purchased the Glenn Milk Plant from Dairy Farmers of America, Inc. in February 2003. The Glenn Milk Plant processed raw milk into powdered milk and butter at this location from 1988 to 2003. Dairy Farmers of America discharged up to 280,000 gallons per day (gpd) of cooling water to Walker Creek and up to 200,000 gpd of process water to treatment ponds. The current Discharger has: 1) converted the large powdered milk plant to a small cheese production facility, 2) ceased discharging to surface waters, and 3) significantly reduced the volume and organic loading of wastewater discharged to land. The Discharger submitted a Report of Waste Discharge in August 2004. The Regional Water Board adopted Order No. R5-2005-0019, reflecting the change in names and ownership; however, the waste discharge requirements remained unchanged.

Both process wastewater and non-contact cooling water are discharged to several wastewater ponds. Process wastewater includes whey, wash water, and boiler blowdown. Whey is expelled as curds are drained, pressed, and washed during the production of cheese. Wash water includes several food-grade cleaning compounds used to clean equipment, work areas, and to flush lines. Heated water from the boiler is used to pasteurize raw products and to heat cultures and is softened by using an ion exchange system. To control the quality of boiler water, a couple of gallons of boiler blowdown are discharged daily and makeup water is added. Non-contact cooling water consists of un-chilled well water used to cool the compressor and culture vats. The compressor cooling water is a constant discharge, while the cooling water from the culture vats is an intermittent discharge. The cooling water effluent is essentially the same quality as the regional groundwater with an increased temperature.

The Discharger proposes to discharge a maximum of 8,000 gallons per day (gpd) of process wastewater and an estimated 14,000 gpd of non-contact cooling water to three, unlined, wastewater ponds (Ponds 1, 2, and 3) with aerators, south of County Road 39. Wastewater treatment consists of aeration, biological degradation, settling, and percolation through soils. There are four northern ponds (Ponds 4, 5, 6, and 7), which have not been used since the cheese plant began production due to the significant decrease in wastewater volume. The RWD indicates the design capacity of all seven ponds is approximately 201 million gallons. Maximum anticipated flows, including non-contact cooling water, are approximately 670,000 gallons per month or 8 million gallons per year, which is only four percent of the total design capacity.

The Discharger has significantly decreased the discharge of process wastewater and cooling water from the cheese plant, as compared to the previous milk plant. The volume of process wastewater has been reduced by 97 percent, from 0.25 million gallons per day (mgd) at the milk plant to 0.008 mgd at the cheese plant. Cooling water has been reduced by 97 percent, from 0.50 mgd at the milk plant to 0.014 mgd at the cheese plant. Previously, Dairy Farmers of America discharged non-contact cooling water to Walker Creek; however, the cheese plant has no surface water discharges. All cooling water is discharged to the wastewater ponds.

EFFLUENT CHARACTERISTICS

The general characteristics and volume of each waste stream from the Facility are summarized below.

Waste Stream Characteristics					
<u>Waste Stream</u>	<u>Characteristics</u>	<u>Volume (gal/month)</u>	<u>Volume (gpd)</u>	<u>Volume (mgd)¹</u>	<u>% of Total Discharge</u>
Process Water:					
Whey wastewater	Milk, cream, enzymes, bacteria, salt	190,000	6,333	0.0063	28
Wash water	Milk, cream, enzymes, bacteria, salt, detergents, caustic acid	50,000	1,667	0.0017	8
Boiler blowdown	Source water, salt for water softener	60	2	<0.0001	<1
Process Water Subtotal		240,000	8,000	0.008	36
Non-contact Cooling water²	Heated source water	430,000	14,333	0.014	64
Total		670,000	22,333	0.022	100
¹ mgd=million gallons per day ² Cooling water is discharged 24 hours per day, seven days per week.					

In March 2005 and May 2006, Sierra Nevada Cheese and Central Valley Water Board staff collected wastewater samples and measured flows to document waste loads during various steps of cheese production, cleaning, etc. The quality of the process water is highly variable depending on the type of cheese produced and whether wash water is discharged. The following tables provide waste loads and concentrations for the various types of cheese production and other wastewaters.

The waste loads from jack cheese wastewater are based on the production of 120 batches of cheese per month. The production of jack cheese includes wastewaters from whey drainage, washing, and pressing. Approximately 2,400 pounds per month of salt are added to the curd after the whey has been drained. Adding salt after draining the whey results in very little salt discharging to the wastewater ponds.

Jack Cheese Wastewater						
Constituent	<u>Whey Drain</u> (126,240 gal/month)		<u>Whey Wash</u> (33,600 gal/month)		<u>Press Whey¹</u> (240 gal/month)	
	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)
pH	6.50	-	6.70	-	-	-
BOD ²	41,100	43,295	15,500	4,346	31,400	63
COD ³	81,600	85,959	25,000	7,009	51,600	103
Sodium	448	472	214	60	16,200	32
Potassium	1,670	1,759	717	201	1,560	3
Calcium	439	462	266	75	2,080	4
Sulfate	68.3	72	35.1	10	124	<1
Chloride	1,600	1,685	679	190	23,900	48
Total N	836	881	4,420	1,239	1,310	3
Kjeldahl N	831	875	4,420	1,239	1,310	3
NO ₃ + NO ₂	4.66	5	2.66	1	2.71	<1
TDS ⁴	32,300	34,025	10,600	2,972	59,000	118

¹ No data available for jack cheese; therefore, used data from similar wastewater (cheddar cheese press whey).
² BOD= Biochemical oxygen demand
³ COD=Chemical oxygen demand
⁴ TDS= Total dissolved solids

The waste loads from cheddar cheese wastewater are based on the production of six batches of cheese per month. The production of cheddar includes wastewaters from whey drainage and whey pressing; however, there is no whey washing. Approximately 360 pounds per month of salt are added to the curd after they whey has been drained.

Cheddar Cheese Wastewater				
Constituent	<u>Whey Drain</u> (16,080 gal/month)		<u>Press Whey</u> (30 gal/month)	
	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)
pH	-	-	5.47	-
BOD	46,700	6,266	31,400	8
COD	77,400	10,386	51,600	13
Sodium	417	56	16,200	4

Cheddar Cheese Wastewater				
Constituent	<u>Whey Drain</u> (16,080 gal/month)		<u>Press Whey</u> (30 gal/month)	
	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)
Potassium	1,310	176	1,560	<1
Calcium	421	56	2,080	1
Sulfate	101	14	124	<1
Chloride	988	133	23,900	6
Total N	911	122	1,310	<1
Kjeldahl N	908	122	1,310	<1
NO ₃ + NO ₂	2.84	<1	2.71	<1
TDS	30,000	4,025	59,000	15

The waste loads from cream cheese wastewater are based on the production of four batches of cheese per month. The production of cream cheese includes wastewaters from whey drainage; however, there is no pressing or washing of whey. Approximately 600 pounds per month of salt are added to the curd after the whey has been drained.

Cream Cheese Wastewater					
<u>Whey Drain</u> (6,172 gal/month)					
Constituent	Concentration (mg/L)	Load (lbs/mo)	Constituent	Concentration (mg/L)	Load (lbs/mo)
pH	4.90	-	Sulfate	114	6
BOD	35,200	1,813	Chloride	7,210	371
COD	68,300	3,518	Total N	642	33
Sodium	4,390	226	Kjeldahl N	641	33
Potassium	1,790	92	NO ₃ + NO ₂	0.99	<1
Calcium	1,080	56	TDS	37,700	1,942

The waste loads from paneer cheese wastewater are based on the production of 7.4 batches of cheese per month. The production of paneer cheese includes wastewaters from whey pressing; however, there is no drainage or washing of whey. No salt is utilized in the production of paneer cheese.

Paneer Cheese Wastewater					
Press Whey (7,681 gal/month)					
Constituent	Concentration (mg/L)	Load (lbs/mo)	Constituent	Concentration (mg/L)	Load (lbs/mo)
pH	5.14	-	Sulfate	100	6
BOD	42,700	2,737	Chloride	870	56
COD	91,100	5,839	Total N	4,680	300
Sodium	473	30	Kjeldahl N	4,670	299
Potassium	1,340	86	NO ₃ + NO ₂	6.01	<1
Calcium	597	38	TDS	31,700	2,032

The table below includes the waste loads from wash waters used to clean equipment, work areas and to flush lines, as well as cooling waters, which are essentially the same quality as the local groundwater.

Other Process Wastewater Discharges						
Constituent	Floor Wash (40,016 gal/mo)		Line Wash (10,004 gal/month)		Non-Contact Cooling Water (429,520 gal/month)	
	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)	Concentration (mg/L)	Load (lbs/mo)
pH	6.67	-	10.39	-	7.16	-
BOD	5,780	1,930	2	<1	2	7
COD	9,080	3,032	86	7	2	2
Sodium	795	265	228	19	28	25
Potassium	241	80	4	<1	4	4
Calcium	205	68	34	3	40	143
Sulfate	130	43	15.6	1	15	4
Chloride	1,050	351	82.8	7	0.6	<1
Total N	68	23	3.2	<1	3.3	12
Kjeldahl N	64	22	1.0	<1	0.2	<1
NO ₃ + NO ₂	3.6	1	3.2	<1	3.1	1
TDS	5,200	1,736	804	67	282	1,011

The average waste loads and concentrations for the combined wastewater sources (process and cooling waters) were calculated from individual stream analyses and an average overall flow of 670,000 gallons of effluent per month, as follows:

Combined Wastewater Sources							
Constituent	Load (lbs/mo)	Load (lbs/day)	Average Concentration (mg/L)	Constituent	Load (lbs/mo)	Load (lbs/day)	Average Concentration (mg/L)
BOD	60,465	2,016	10,821	Chloride	2,847	95	509
COD	115,873	3,862	20,737	Total N	2,613	87	468
Sodium	1,266	42	227	Kjeldahl N	2,593	86	464
Potassium	2,413	80	432	NO ₃ + NO ₂	9	0.3	2
Calcium	907	30	162	TDS	47,943	1,598	8,580
Sulfate	156	5.2	28				

SURFACE WATERS AND GROUNDWATER

Walker Creek, a tributary of the Colusa Basin Drain, bisects the property; however, there are no surface water discharges from the facility.

Water supply for the Facility is supplied by two on-site production wells, which are approximately 200 feet deep. The quality of the deep, regional groundwater is represented by the non-contact cooling water data, shown above.

There are four shallow groundwater monitoring wells located around the . Groundwater has been measured in these wells between 6 and 20 feet below ground surface. Soils encountered during well construction (approximately 30 feet deep) ranged from sands and gravels to silty clays. Only eight groundwater sampling events have been conducted between 1994 and 2006. Dairy Farmers of America conducted four sampling events between 1994 and 2001, during their large-scale operation. The current Discharger, operating under significantly reduced production, conducted four additional sampling events between 2005 and 2006. Due to questionable sampling procedures during past groundwater monitoring and the limited data set, it is not possible to adequately characterize the shallow groundwater. Therefore, it is infeasible to determine compliance with Resolution 68-16 until further groundwater characterization has been completed.

DISCHARGE PROHIBITIONS AND SPECIFICATIONS

This Order contains discharge prohibitions and specifications to ensure the treatment system is properly operated.

Discharge Specification B.1 limits the monthly average daily discharge of process water (excluding non-contact cooling water) to 0.008 mgd.

INTERIM GROUNDWATER LIMITATIONS

Limitation E.2 states that releases of waste constituents from any storage, treatment, or disposal component shall not cause or contribute to groundwater degradation as follows: Total coliform organisms shall not exceed or be equal to 2.2 MPN/100mL; electrical conductivity shall not exceed 700 umhos/cm; nitrate plus nitrite shall not exceed 10 mg/L; and sulfate shall not exceed 250 mg/L.

PROVISIONS

Provision E.2.a of the proposed Order requires the submission of a *Flow Measurement and Groundwater Monitoring Plan*, which is needed to establish consistent flow measurement and sampling procedures to be used to comply with this Order's Monitoring and Reporting Program. The plan will allow review of proposed monitoring procedures and help insure that sample results are representative of site conditions.

Provision E.2.b requires the submission of a *Groundwater Quality Assessment Report*, which is needed to evaluate background and downgradient groundwater conditions at the Facility. Upon completion of the Groundwater Quality Assessment Report, the Regional Water Board may consider whether there is evidence of violations of water quality objectives, impairment to beneficial uses, pollution, nuisance, contamination, or unreasonable degradation.

MONITORING REQUIREMENTS

This Order requires the Discharger to monitor process and cooling water flows on a daily basis, ponds on a weekly basis, groundwater on a quarterly basis, leachfields on a quarterly basis, and solids on a quarterly basis. The monitoring program insures that the daily discharge of process water is not exceeded, that the ponds have sufficient capacity, and provides water quality characteristics of the effluent and upgradient and downgradient groundwater. In addition, the groundwater monitoring results will determine if the Discharger is complying with the interim groundwater limitations.

REOPENER

Existing groundwater data is insufficient to develop groundwater limitations, so the proposed Order contains interim groundwater limitations. This Order may be reopened to reconsider groundwater limitations and treatment processes if it is determined that the discharge from the Facility is adversely impacting the underlying groundwater.