CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0047
WASTE DISCHARGE REQUIREMENTS
FOR
SK FOODS AND COLUSA COUNTY CANNING COMPANY
WILLIAMS TOMATO PROCESSING FACILITY
COLUSA COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Regional Board), finds that:

1. SK Foods and Colusa County Canning Company (hereafter known as Discharger) submitted a Report of Waste Discharge (RWD) dated 2 September 2005 to obtain revised Waste Discharge Requirements (WDRs) for the discharge of tomato processing wastewater at the Colusa County Canning Company facility at 6229 Myers Road in Williams. RWD Addenda were submitted on 30 January 2006 and 23 February 2006.

2. The Colusa County Canning Company facility is in Section 32, T15N, R2W, and Sections 1 and 4, T14N, R2W, MDB&M as shown on Attachment A, which is attached hereto and made part of the Order by reference. The processing plant, which is owned by the Discharger, comprises Assessor's Parcel Number 17-090-062.

3. Order No. 5-01-273, adopted by the Regional Board on 7 December 2001, prescribes requirements for the discharge of tomato processing wastewater from the plant's retail products line to irrigate crops on land owned by Claire L. Reynolds. Order No. 93-089, adopted by the Regional Board on 25 June 1993, prescribes requirements for the discharge of tomato processing wastewater from the plant's paste line to irrigate crops on land owned by F.J. Myers, LLC.

4. The Discharger has applied for revised WDRs to change the discharge location to land owned by the Discharger and allow increased flows resulting from business growth. The proposed new land application areas comprise Assessor's Parcel Nos. 018-090-004, -008, and –009, and 018-08-038.

Existing Facility and Operations

5. The Discharger processes tomatoes and tomato products intermittently during the year. During the fresh pack season (approximately July through October), the tomato paste line produces tomato paste. The retail products line makes canned diced tomatoes, whole tomatoes, and tomato juice products by processing fresh tomatoes during the fresh pack season and remanufacturing previously processed tomatoes at other times. The processing facility site plan is depicted on Attachment B, which is attached hereto and made part of the Order by reference.

6. The paste line has been in operation since 1982. Fresh tomatoes trucked to the facility during the fresh pack season are transported by water flume into the processing plant, where they are washed and macerated. The juice and pulp are squeezed out and concentrated by cooking and evaporation to make tomato paste.

7. Process wastewater from the paste line is generated from the flumes, tomato washing, evaporation, drainage from the product handling areas, water softener regeneration brine, and boiler blowdown. The flume water is screened to remove coarse solids and recycled, but ultimately makes up approximately 45 percent of the paste line process wastewater generated during the fresh pack season. Condensate recovered from the evaporation process constitutes approximately 50 percent of the total wastewater flow, and the remaining 5 percent is comprised of wastewater from the water softener, boiler, hot breaks, finishers, aseptic processing and filling operations, and clean-in-place system.

8. Process wastewaters are commingled and discharged to a sump, as indicated on Attachment C, which is attached hereto and made part of the Order by reference. The wastewater passes through a 0.060 mesh screen and four 0.020 mesh screens prior to discharge to the land application areas. Coarse solids removed from the flume water and wastewater solids removed by the screens are collected and disposed of off-site. During emergencies, the paste line process wastewater can be diverted to a wastewater storage pond at the processing facility.

9. Between 1982 and 2005, screened process wastewater from the paste line was discharged to nearby farmland owned by F.J. Myers, LLC. The Myers property, shown on Attachment A comprises 656 acres that are typically planted to row crops and flood irrigated with wastewater during the fresh pack season only.

10. The retail products line began operating in 2001, and is run intermittently throughout the year. During the fresh pack season, fresh tomatoes are flumed into the processing plant, where they are steam peeled, prepared, and canned. During the off-season (approximately November through June), previously processed tomato products are re-processed.

11. During the fresh pack season, retail line process wastewater is generated from the flumes, steam peeling, tomato preparation, can filling and closing, and can cooling. The flume water is screened to remove coarse solids and recycled, and comprises approximately 35 percent of the retail line process wastewater. Condensate constitutes approximately 50 percent of the total wastewater flow, and the remaining 15 percent is comprised of wastewater from the water softener, boiler, steam peeler, can filling and closing, and can cooling.

12. During the off-season, the retail line is operated intermittently, and process wastewater is generated primarily from cleaning product storage, packaging, and blending equipment.

13. Process wastewaters from the retail line are commingled and discharged to the sump. As with the paste line, the wastewater passes through the screen system prior to discharge. Between 2002 and 2005, screened wastewater was pumped directly to the 145-acre land application area owned by Claire L. Reynolds during the fresh pack season (shown on Attachment A). During the off-season, screened retail line wastewater was stored in the wastewater storage pond until crop irrigation was needed.

14. The pond is approximately ten feet deep with a bottom elevation of approximately 86 feet above mean sea level. The capacity of the wastewater storage pond is 2.7 million gallons at two feet of

freeboard. According to the RWD, the pond is lined with 12 inches of imported clay mixed with native soil and compacted to 95 percent relative compaction. The mix design of 50 percent clay and 50 percent native soil was determined based on permeability testing, and is estimated to provide a saturated permeability of 1 x 10^{-6} cm/s. The pond is equipped with 40 horsepower of aeration equipment.

15. A second storage pond known as the Paste Storage Pond was constructed in the early 1980s. This 0.8-million gallon pond is no longer used to store process wastewater.

16. Both product lines use chemicals for cleaning and sanitizing processing equipment. Estimated usage rates are summarized below.

Chemical	Concentration (percent)	Annual Usage
Chlorinated foam	12	3,500 gal
Sodium bromide	40	3,300 lb
Sodium hypochlorite	12	25,000 gal
Phosphoric acid/surfactant	10	1,000 gal
Sodium hydroxide	12	5,000 gal
Calcium hydroxide	100 (dry)	15,000 lb

17. Based on analytical data from 2004, the RWD characterized screened process wastewater from the two processing lines as summarized below.

Constituent/Parameter	Units	Mean Analytical Result		Applicable Water Quality Limit [1]
		Paste Line	Retail Line	
pH	std.	5.3	7.9	6.5 to 8.4
Biochemical oxygen demand	mg/L	1,038	1,052 [2]	--
Chemical oxygen demand	mg/L	1,031 [3]	830	--
Total suspended solids	mg/L	1,001	421	--
Settleable matter	mL/L/hr	19	29 [2]	--
Electrical conductivity	umhos/cm	1,221	1,685	700
Total dissolved solids	mg/L	1,249	1,207	450
Fixed dissolved solids	mg/L	514	988	--
Ammonia nitrogen	mg/L	5	NA	1.5
Total Kjeldahl nitrogen	mg/L	45	51	--
Nitrate + nitrite nitrogen	mg/L	2.7	2	10

Constituent/Parameter	Units	Mean Analytical Result		Applicable Water Quality Limit [1]
		Paste Line	Retail Line	
Total nitrogen	mg/L	48	23 [2]	--
Alkalinity	mg/L	114	NA	--
Aluminum [4]	mg/L	21	NA	0.20
Boron [4]	mg/L	0.2	NA	0.70
Calcium [4]	mg/L	69	NA	--
Carbonate as CaCO3	mg/L	1,287	NA	--
Chloride [4]	mg/L	131	NA	106
Fluoride [4]	mg/L	64	NA	1
Iron [4]	mg/L	31	NA	0.3
Magnesium [4]	mg/L	38	NA	--
Manganese [4]	mg/L	0.8	NA	0.05
Phosphorus	mg/L	7	7 [2]	--
Potassium [4]	mg/L	73	NA	--
Sodium [4]	mg/L	100	NA	69
Sulfate	mg/L	60	NA	250
Silica	mg/L	94	NA	--

[1] Water quality limit to apply narrative water quality objectives specified in the Basin Plan for protection of the beneficial uses of groundwater.
[2] Average of analytical results from 2001 through 2004.
[3] Average of analytical results from 1982 through 2003.
[4] Analytical results are dissolved concentrations.
-- None applicable
NA Not analyzed.

These data indicate that the wastewater is typically high in degradable organics, nitrogen, and salinity. Most of the nitrogen is present in organic form. Most of the dissolved solids in the retail line process wastewater are fixed (inorganic), whereas less than one-half of the dissolved solids in the paste line process wastewater are fixed.

18. Boilers are used to produce steam for both product lines. Based on information presented in the 2001 RWD for the retail line, boiler blowdown is characterized as summarized below. Current boiler blowdown rates are estimated to be 60,000 gallons per 24-hour day during the fresh pack season, and 760 gallons per 8-hour day during the off-season.

Constituent/Parameter	Expected Concentration, mg/L	Applicable Water Quality Limit, mg/L
Total dissolved solids	1,980	450
Sodium sulfite	40	--
Sodium	1,600	69
Chloride	165	106
Sulfate	210	250
Nitrate as NO_3	55	45

As indicated above, boiler blowdown greatly exceeds the applicable water quality limit for dissolved solids and sodium. It also exceeds the applicable water quality limits for chloride and nitrate, but to a lesser degree.

19. Supply water is softened by an ion exchange system to prevent boiler scaling. The system uses 840 pounds of salt per regeneration cycle, and each regeneration event generates 8,222 gallons of brine, which is commingled with other process wastewaters. Analytical results for the water softener regeneration brine are pending, but are expected to show significantly elevated salinity concentrations.

20. Process wastewater flows (including all liquid waste streams from the facility) for both production lines vary during the processing season and from year to year depending on crop yield. For the paste line, monthly average flows ranged from 0.8 to 1.9 million gallons per day (mgd), with an approximate mean of 1.2 mgd between 1982 and 2005. Total annual flows during the same period ranged from 82 to 211 million gallons (MG) per year, with a mean of 132 MG per year.

21. For the three years of retail line operation (2002, 2004, and 2005), monthly average flows ranged from 5,000 to 24,000 gallons per day (gpd), and total annual flows ranged from 3.2 to 9.1 MG per year.

22. Storm water from outdoor areas of the plant and building roof drains is collected into a 1.25-acre retention pond in southeastern corner of the processing facility known as the “estuary”. Storm water in the estuary is allowed to percolate and evaporate, and is not discharged off-site. Storm water runoff from the land application fields will be retained on-site.

23. Domestic wastewater generated at the processing plant is discharged to a septic system permitted by the Colusa County Environmental Health Department.

Proposed Changes in the Discharge

24. The Discharger plans to cease the discharge to the Myers and Reynolds properties and has purchased two properties for land application of process wastewater. These properties, Ranch 71 and Ranch 72 are shown on Attachments D and E, respectively, both of which are attached hereto and made part of this Order by reference. Ranch 71 is 643 acres and has four irrigation wells along

its western boundary. Ranch 72 is 229 acres and has two irrigation wells along its western boundary. Both sites will receive wastewater for irrigation during the fresh pack season, but only Ranch 72 will receive wastewater during the off-season.

25. A new pump station will be constructed, and screened process wastewater will be conveyed to Ranch 71 and Ranch 72 by a 3.6-mile, 20-inch diameter force main to a head ditch at each site. A flow velocity of four to five feet per second will be maintained in the force main to prevent solids settling and reduce sulfide production, which can cause odors. The force main will be cleaned periodically by "pigging".

26. The wastewater will be delivered to individual fields by ridge and furrow irrigation. Each field drains to a tailwater ditch that routes tailwater and storm water to the northern and eastern property boundaries, where it is collected and returned to the main irrigation distribution system. Tailwater generation is expected to be minimal.

27. In case of power failure or pump system failure, wastewater will be temporarily diverted to the wastewater storage pond by gravity flow from the pump station holding tank.

28. Planting and harvesting will be staggered to allow continued irrigation of some fields while other fields are being dried and harvested. Typical crops to be grown are summarized below.

Crop	Nitrogen Demand (lb/ac)	Supplemental Nitrogen Needs [1]	Estimated Salinity Uptake (lb TDS/ac) [2]
Alfalfa	360	Unlikely	2,093
Corn	220 to 260	Possible	1,750
Milo	220 to 260	Possible	--
Sudan grass	220 to 260	Possible	--
Wheat	140	Unlikely	1,321

[1] Based on a carbon to nitrogen ratio of 18.7, the RWD states that a total nitrogen loading of 150 percent of the crop demand is justified because of atmospheric losses and crop uptake inefficiency.

[2] The RWD did not support this estimate with actual data or published studies. Without a recognized source for these values, allowing credit for these salinity uptake values is not justified.

The *2006 Cropping Plan* included in the January 2006 RWD Addendum states that all fields will be planted between May and June and irrigated with fresh water until the fresh pack season begins. Anticipated harvest dates range from October through November.

29. Each year, a 50-acre area within the land application sites will be used as a dedicated land spreading area for screened solids from the processing facility. The February 2006 RWD Addendum states that the solids will be spread in a layer not to exceed two inches, and will be disked to incorporate them into the soil within 24 hours. The solids application area would not receive process wastewater and would not be cropped until the following year, when wastewater would be used for

irrigation and another 50-acre area would be used for solids application. The RWD Addendum did not provide characterization data for this waste, but it is expected to contain high concentrations of BOD and nitrogen.

30. The Discharger proposes the following flow limits.

Season	Wastewater Source	Proposed Flow Limit
Off Season (November – June)	Retail Line Only	0.20 mgd (100 days per year)
Fresh Pack (July – October)	Paste and Retail Lines	4.0 mgd

The water balance provided in the January 2006 RWD Addendum indicates that the wastewater storage pond and proposed land application sites will provide adequate storage and disposal capacity for normal to above-normal precipitation years. During the 100-year total annual precipitation event, the wastewater storage pond and proposed land application sites will provide adequate storage and disposal capacity only if retail line production is curtailed during the rainy season.

31. During the off-season, process wastewater will be stored in the wastewater storage pond, which provides approximately 13 days of storage between irrigation events. The wastewater will be used to irrigate Ranch 72, and will be supplemented with fresh water as needed. If wet weather makes irrigation unnecessary, the retail line will be closed until the rain stops. The RWD states that the total off-season hydraulic loading to Ranch 72 will be less than 15 percent process wastewater.

32. Based on normal ET_0 rates and a ten percent leaching fraction, the RWD estimates that four inches of water will be applied every 15 days during the fresh pack season. Based on 853 usable acres at Ranch 71 and Ranch 72, this equates to 6.2 mgd. Initially, approximately 0.6 to 3.8 mgd of supplemental irrigation water will be required from approximately April through September each year, but supplemental irrigation during the fresh pack season will decrease to a maximum of approximately 2.2 mgd when daily wastewater flows reach 4.0 mgd.

33. Supplemental irrigation water can be added to the irrigation system either at the processing plant (from the process supply wells) or the land application sites (from existing irrigation supply wells). The force main will be flushed with one pipe volume of fresh water periodically during operations and prior to each significant plant shutdown to prevent discharge of anaerobic wastewater to the land application sites.

34. The RWD states that the Discharger will monitor the dissolved oxygen concentration of the discharge during hot weather, and will add supplemental fresh water as needed to maintain adequate oxygen levels and prevent anaerobic conditions. Although the Discharger's water balance accounts for supplemental irrigation water to satisfy crop needs, it is not clear whether the predicted supplemental water addition rates will be sufficient to prevent anaerobic conditions at the land application sites, particularly as wastewater flow rates increase to the requested flow limit of 4.0 mgd. The Discharger may need to implement additional controls to maintain adequate oxygen levels.

35. Based on a monthly average effluent flow rate of 4.0 mgd, a flow-weighted average BOD concentration of 916 mg/L, and four inches of applied wastewater every 15 days during the fresh pack season, the RWD proposed a maximum daily BOD loading of 775 pounds per acre per day and a cycle average loading of 50 pounds per acre per day.

36. At the proposed flow limits, the RWD estimates that a total of 24 inches of wastewater with an average total nitrogen concentration of 49 mg/L will be applied each year, resulting in a total nitrogen load of 265 pounds per acre per year.

37. The Discharger submitted a salt mass balance with the January 2006 RWD Addendum. The following table summarizes the salt mass balance, which is based on 2005 flows and analytical data.

Salinity Source	Volume Discharged (Mgal/yr)	Total Dissolved Solids Mass (ton/yr)	Fixed Dissolved Solids Mass (ton/yr)
Supply water	110.6 [1]	202	176
Water softener	0.56	29	29
Boiler blowdown	1.35	11	10
Sterilization [2]	<0.01	13	13
Food ingredients [3]	<0.0002	4.8	3.2
Tomatoes (product losses)	33.5	235	87
Total	**146**	**494**	**318**

[1] Excluding water later discharged as water softener regeneration brine or boiler blowdown.

[2] Includes clean in place, screen sterilization, cooling tower and can cooler sterilization (sodium hydroxide, sodium hypochlorite, potassium hydroxide, sodium hydroxide, and sodium bromide).

[3] Includes calcium chloride, citric acid, and sea salt.

This analysis indicates that approximately 59 percent of the total dissolved solids (55 percent of the fixed dissolved solids) in the wastewater is associated with controllable factors. Segregating the water softener brine and boiler blowdown would reduce TDS by 8 percent and FDS by 12 percent on average. However, the analysis also indicates that "product losses" account for the majority of the excess dissolved solids (both fixed and volatile), and that relatively modest reductions in this area could significantly reduce the salinity of the discharge.

Site-Specific Conditions

38. The land in the vicinity of the processing plant and proposed land application sites slopes gently eastward towards the Colusa Basin Drain, with ground surface elevations ranging from approximately 95 to 70 feet above mean sea level (MSL).

39. According to the RWD, the processing facility and most of the new land application sites are outside of the 100-year flood plain. Portions of Ranch 71 along Cortina Creek are within the 100-year flood plain, but are protected from inundation by man-made berms along the creek, which was realigned to flow around Ranch 71. The eastern portion of Ranch 71 is apparently within the Sycamore Slough flood plain, but is protected by man-made berms. The US Army Corps of Engineers has not calculated floodplain elevations for the area, but the February 2006 RWD Addendum estimated the 100-year floodplain elevation to be 45 feet above mean sea level based on comparison of FEMA Flood Insurance rate Maps to USGS topographic maps. The February 2006 RWD addendum provided survey data for the Ranch 71 flood protection berms. The survey data show that the crest of the berms ranges from 44.16 feet to 58.63 feet above mean sea level, indicating that only minor modifications to a portion of the berm would be needed to provide 100-year floodplain protection.

40. Subsurface soils at the facility and new land application sites are primarily Mallard clay loam, Capay clay loam, and Willows silty clay. The RWD states that the Capay soils are very deep and moderately well drained, whereas the Mallard soils are very deep and somewhat poorly drained. Exploratory drilling at the Ranch 71 and 72 sites indicates that shallow subsurface soils are interbedded sands and silty sands with varying amounts of silt and clay.

41. Pre-discharge soil sampling was performed at the Ranch 72 site in October 2005. The results of that sampling are summarized below. Soils at the Ranch 71 site have not been sampled.

Sample ID (depth)	Soil Type	Analytical Results					
		EC [1]	N [2]	SAR [3]	TOC [4]	CEC [5]	pH
T1	Silty clay						
(2-3 ft)		840	0.05	1.3	0.53	26.0	7.6
(4-5 ft)		500	0.03	1.0	0.37	27.2	7.8
T2	Clay loam						
(2-3 ft)		1,870	0.07	7.3	0.93	30.9	7.6
(4-5 ft)		1,020	0.06	6.8	0.72	27.7	7.7
T3	Clay loam						
(2-3 ft)		1,700	0.04	13.8	0.38	24.5	8.1
(4-5 ft)		1,640	0.02	15.5	0.28	20.2	8.9
T4	Silty clay						
(2-3 ft)		1,500	0.07	5.0	0.96	30.7	7.6
(4-5 ft)		2,620	0.05	10.7	0.91	35.5	7.8

Sample ID (depth)	Soil Type	Analytical Results					
		EC [1]	N [2]	SAR [3]	TOC [4]	CEC [5]	pH
TB [6]	Clay loam						
(2-3 ft)		810	0.05	4.9	0.58	30.0	8.0
(4-5 ft)		1,090	0.03	6.9	0.41	21.5	8.1

[1] Electrical conductivity, umhos/cm.
[2] Total nitrogen, percent.
[3] Sodium Adsorption Ratio, unitless.
[4] Total organic carbon, percent dry weight.
[5] Cation exchange capacity, meq/100 gm.
[6] Located outside of irrigated areas.

According to the RWD, these data indicate that the soil is nitrogen deficient and has a moderate organic content. The SAR values are generally high, indicating potential problems with poor water penetration. However, the high SAR values also correspond to EC values greater than 1,200 umhos/cm, which indicates that SAR may not cause problems. The cation exchange capacity and moderately alkaline pH are typical of clay soils.

42. The average annual precipitation in the Williams areas is 15.63 inches and the 100-year total annual precipitation is 27.71 inches.

43. The reference evapotranspiration rate (ET_0) for the area is approximately 53 inches.

44. Surrounding land uses are agricultural, and few residences are nearby.

Groundwater Considerations

45. Groundwater is generally encountered at approximately 88 to 38 feet MSL (about 1 to 8 feet below the ground surface). There are currently monitoring wells at the processing plant, the Myers property, the Reynolds property, Ranch 71, and Ranch 72 as shown on Attachment A. Groundwater beneath the processing facility and former land application areas are as shallow as 3 to 8 feet below ground surface. At the Ranch 71 and Ranch 72 land application sites, typical groundwater depths are as shallow as 1 to 4 feet below ground surface. Seasonal low groundwater levels (October to December) are typically five to seven feet lower than the seasonal high water. Monitoring well information is summarized below.

Well ID	Location/Function [1]	Approximate Elevation (feet MSL)		Approximate Depth to Groundwater [3] (feet)
		Ground Surface [2]	Water Table [3]	
LF-1	Processing Facility - U	95	89	6
MW-4	Reynolds Property - U Processing Facility - U	90	87	3

Well ID	Location/Function [1]	Approximate Elevation (feet MSL)		Approximate Depth to Groundwater [3] (feet)
		Ground Surface [2]	Water Table [3]	
MW-5	Myers Property - U Reynolds Property - D	85	81	4
MW-6	Myers Property - U Reynolds Property - D	88	80	8
MW-7	Reynolds Property - U	90	84	6
MW-8	Myers Property - U Processing Facility - D	92	85	7
MW-9	Processing Facility - D	94	87	7
MW-10	Myers Property - D	85	77 [4]	8 [4]
MW-11	Ranch 72 - U Myers Property - D	80	75 [4]	5 [4]
MW-12	Ranch 72 - U Myers Property - C	80	75 [4]	5 [4]
MW-16	Myers Property - U Reynolds Property - D	87	81 [4]	6 [4]
MW-17	Myers Property - D	83	75 [4]	8 [4]
MW-18	Myers Property - D	84	78 [4]	6 [4]
MW-20	Processing Facility - D	90	85 [4]	5 [4]
MW-21 [5]	Ranch 72 - D Myers Property - D	77	69 [4]	8 [4]
MW-22	Ranch 72 – U	71	66 [4]	5 [4]
MW-23	Ranch 72 – U	71	70 [4]	1 [4]
MW-24	Ranch 71 - U	50	49 [4]	1 [4]
MW-25	Ranch 71 - U	53	51 [4]	2 [4]
MW-26	Ranch 71 - D	40	38 [4]	2 [4]
MW-27	Ranch 71 - D	42	40 [4]	1 [4]

[1] U = upgradient, D = downgradient, C = cross gradient.

[2] Estimated from USGS topographic map to assess the depth to groundwater within the land application area. Because some wells are within elevated roadways, the ground surface elevation reported here may not correspond to surveyed ground surface elevations at the well.

[3] Approximate seasonal high groundwater levels (February to May) based on 2005 Annual Report. Seasonal low groundwater levels (October to December) are typically five to seven feet lower than the seasonal high water.

[4] Based on six to nine months of monthly monitoring.

[5] This well is at the approximate center of the cone of depression created by the nearby irrigation supply well, as discussed below.

46. Water for tomato processing and sanitation is supplied by two production wells at the processing facility. Well 1 is perforated from 330 to 410 feet below ground surface (bgs) and is typically pumped at 1,000 gallons per minute (gpm). Well 2 is perforated from 330 to 440 feet bgs and is typically pumped at 1,000 gpm. Based on monitoring conducted in 2005, the character of the process water supply is summarized below.

	Range of Results [1]	
Constituent	Supply Well 1	Supply Well 2
Electrical Conductivity	640 to 710	650
Total dissolved solids	350 to 420	370
Fixed dissolved solids	280 to 380	300
Nitrate nitrogen	<0.02 to 1.8	3.4
Total Kjeldahl nitrogen	<1 [2]	<1 [2]
Sodium	61 to 72	62
Chloride	53 to 66	54
Iron	0.06 to 0.16	<0.05 [2]
Manganese	0.01 to 0.02	<0.01 [2]
Sulfate	65 to 70	67
Hardness as $CaCO_3$	220 to 270	220

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.

These data indicate that the process water supply is moderately hard, but otherwise of good quality.

47. Based on recent groundwater monitoring data, the groundwater flow direction is generally toward the east, but there is a distinct cone of depression centered on the western boundary of Ranch 72 near MW-21, where there is an agricultural well that supplies water to Ranch 72. Based on monthly groundwater monitoring data from the last six months of 2005, the cone of depression is approximately 20 feet deep and appears to capture shallow groundwater beneath the entire Ranch 72 site during most of the year. It appears that the supply well also captures shallow groundwater from the Myers and Reynolds properties. However, if the supply well is used less when the new sites are irrigated with process wastewater, the water table elevations within approximately 3,000 feet of MW-21 will likely rise. The RWD did not provide construction details, planned pumping schedules, or water quality data for any of the agricultural supply wells.

48. Recent groundwater monitoring data for wells used to monitor the wastewater storage pond at the tomato processing facility are summarized below.

	Range of Results [1]		
Constituent	Upgradient Wells (LF-1 and MW-4)	Downgradient Well (MW-8)	Applicable Water Quality Limit [1]
Electrical Conductivity	800 to 1,300	990 to 1,100	700
Total dissolved solids	490 to 870	620 to 690	450
Fixed dissolved solids	410 to 640	470 to 520	--
Nitrate nitrogen	<0.4 to 43	10 to 22	10
Total Kjeldahl nitrogen	<1.0 to 2.8	<1.0 to 1.4	--
Sodium	67 to 110	71 to 81	69
Chloride	40 to 96	70 to 78	106
Iron	<0.05 [2]	<0.05 [2]	0.30
Manganese	<0.01 to 0.06	1.0 to 1.5	0.05
Sulfate	65 to 110	71 to 80	250

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.
-- None applicable.

These data indicate that background groundwater generally exceeds water quality objectives for conductivity, dissolved solids, nitrate nitrogen, and sodium. Based on these data, it appears that the wastewater storage pond at the processing facility has not degraded groundwater quality despite the fact that the base of the pond is approximately one to two feet above the water table, but statistical analysis is needed to make a formal determination.

49. Recent groundwater monitoring data for wells used to monitor the Reynolds property are summarized below.

	Range of Results [1]		
Constituent	Upgradient Wells (MW-4 and MW-7)	Downgradient Wells (MW-5, -6 and -16)	Applicable Water Quality Limit [1]
Electrical Conductivity	810 to 1,100	1,000 to 1,300	700
Total dissolved solids	490 to 750	640 to 830	450
Fixed dissolved solids	410 to 480	490 to 670	--
Nitrate nitrogen	<0.4 to 43	2.7 to 27	10
Total Kjeldahl nitrogen	<1.0 [2]	<1.0 to 1.9	--
Sodium	58 to 80	63 to 130	69
Chloride	33 to 96	40 to 110	106
Iron	<0.05 [2]	<0.05 to 0.21	0.30
Manganese	<0.1 to 0.6	<0.01 to 0.057	0.05

	Range of Results [1]		
Constituent	Upgradient Wells (MW-4 and MW-7)	Downgradient Wells (MW-5, -6 and -16)	Applicable Water Quality Limit [1]
Sulfate	57 to 74	65 to 110	250

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.
-- None applicable.

These data indicate that background groundwater generally exceeds water quality objectives for conductivity, dissolved solids, nitrate nitrogen, and sodium, and that wastewater discharges to the Reynolds property have caused increases in concentrations of conductivity, dissolved solids, sodium, chloride, iron, and sulfate. The increases in sodium may constitute pollution. However, if groundwater degradation is verified, it is possible that continued use of the supply wells on the western side of Ranch 72 would capture the contaminant plume and mitigate the degradation. It is appropriate to require continued monitoring and a statistical analysis of groundwater quality data to make a formal determination regarding groundwater degradation. If groundwater quality has been degraded and waste constituent concentrations do not decrease over time, the Discharger may be required to clean up and abate the degradation.

50. The Myers property is bisected into a northern and southern portion by Myers Road. The northern portion of the Myers Property is directly downgradient from the processing plant, and the southern portion is directly downgradient of the Reynolds property.

Recent groundwater monitoring data for wells used to monitor the northern portion of the Myers property are summarized below.

	Range of Results [1]		
Constituent	Upgradient Wells (MW-8 and MW-20)	Downgradient Wells (MW-17 and MW-18)	Applicable Water Quality Limit [1]
Electrical Conductivity	820 to 1,300	640 to 1,300	700
Total dissolved solids	520 to 780	420 to 760	450
Fixed dissolved solids	370 to 540	320 to 620	--
Nitrate nitrogen	10 to 27	1.4 to 17	10
Total Kjeldahl nitrogen	<1.0 to 1.6	<1.0 to 1.2	--
Sodium	45 to 81	51 to 93	69
Chloride	55 to 130	48 to 180	106
Iron	<0.05 [2]	<0.05 [2]	0.30
Manganese	<0.01 to 1.5	<0.01 to 0.32	0.05
Sulfate	39 to 80	26 to 59	250

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.
-- None applicable.

These data indicate that background groundwater generally exceeds water quality objectives for conductivity, dissolved solids, and nitrate nitrogen, and that wastewater discharges to the southern portion of the Myers property may have caused increases in concentrations of chloride in groundwater. Like the Reynolds property, it is possible that continued use of the supply wells on the western side of Ranch 72 would capture the contaminant plume (if any) and mitigate the degradation. It is appropriate to require continued monitoring and a statistical analysis of groundwater quality to make a formal determination regarding groundwater degradation. If groundwater quality has been degraded and waste constituent concentrations do not decrease over time, the Discharger may be required to clean up and abate the degradation.

51. The following table summarizes recent groundwater monitoring data for the northern portion of the Myers property, which is west of the processing facility, but north of the remainder of the former land application sites.

	Range of Results [1]		
Constituent	Upgradient Wells (MW-5, -6 and -16)	Downgradient Wells (MW-10, -11, and -12)	Applicable Water Quality Limit [1]
Electrical Conductivity	1,000 to 1,300	580 to 1,800	700
Total dissolved solids	640 to 830	350 to 1,100	450
Fixed dissolved solids	490 to 670	260 to 830	--
Nitrate nitrogen	2.7 to 27	<0.2 to 5.0	10
Total Kjeldahl nitrogen	<1.0 to 1.9	<1 to 3.7	--
Sodium	63 to 130	29 to 110	69
Chloride	40 to 110	18 to 160	106
Iron	<0.05 to 0.21	<0.05 to 5.7	0.30
Manganese	<0.01 to 0.057	<0.06 to 8.9	0.05
Sulfate	65 to 110	<4 to 38	250

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.
-- None applicable.

These data indicate that background groundwater generally exceeds water quality objectives for conductivity, dissolved solids, nitrate nitrogen, and sodium, and that wastewater discharges to the northern portion of the Myers property may have caused increases in concentrations of conductivity, dissolved solids, chloride, iron, and manganese. The increases in sodium, iron, and manganese may constitute pollution. It is appropriate to require continued monitoring and a statistical analysis of groundwater quality to make a formal determination regarding groundwater degradation. If groundwater quality has been degraded and waste constituent concentrations do not decrease over time, the Discharger may be required to clean up and abate the degradation.

52. The Discharger installed seven monitoring wells at the Ranch 71 and Ranch 72 sites in mid-2005, and has been sampling those wells monthly to establish baseline (pre-discharge) groundwater

quality for those sites. As of December 2005, six monthly monitoring events were conducted. These data will support the future use of intrawell statistics to determine whether groundwater degradation results from discharges to the new land application sites. The pre-discharge groundwater monitoring data are summarized below.

	Range of Results [1]			
	Ranch 72		Ranch 71	
Constituent	Upgradient (MW-22 and -23)	Downgradient (MW-21)	Upgradient (MW-24 and -25)	Downgradient (MW-26 and -27)
Electrical Conductivity	470 to 640	990 to 1,200	740 to 1,000	1,400 to 3,500
Total dissolved solids	280 to 390	610 to 790	450 to 630	820 to 2,100
Fixed dissolved solids	190 to 320	410 to 600	360 to 510	790 to 2,100
Nitrate nitrogen	0.4 to 1.4	22 to 25	<0.04 [2]	7.9 to 8.3
Total Kjeldahl nitrogen	<1 to 1	<1.0 to 2.9	<1.0 [2]	<1.0 [2]
Sodium	36 to 54	71 to 81	89 to 150	270 to 620
Chloride	7 to 36	33 to 100	12 to 40	50 to 470
Iron	0.6 to 0.9	<0.05 [2]	<0.05 [2]	<0.05 to 0.06
Manganese	<0.01 to 0.01	<0.01 [2]	0.04 to 0.9	0.12 to 0.74
Sulfate	22 to 31	47 to 67	39 to 58	120 to 880

[1] mg/L except electrical conductivity, which is reported in umhos/cm.
[2] Constituent not detected.

With the exception of the upgradient (eastern) end of the Ranch 72 site, these data indicate that the baseline (pre-discharge) groundwater quality beneath the proposed land application sites exceeds water quality objectives for conductivity and dissolved solids. It appears that past agricultural uses at Ranch 72 have caused groundwater to be polluted by conductivity, dissolved solids, and nitrate. The data for Ranch 71 show greater increases in salinity, some nitrate degradation, and pollution due to sodium, chloride, and sulfate. Presumably, these increases are also due to past agricultural practices.

53. The existing groundwater monitoring network is adequate to assess whether groundwater degradation has occurred from the use of the wastewater storage ponds and the Reynolds and Myers properties. However, both of the new discharge sites have only four wells each (two upgradient and two downgradient). Because of the size of the sites and the fact that the existing downgradient wells may be cross gradient at some times, additional monitoring wells are needed to monitor groundwater beneath the Ranch 71 and Ranch 72 land application sites to ensure future compliance with the Groundwater Limitations of this Order.

Other Considerations for Food Processing Waste

54. Excessive application of food processing wastewater to land application areas can create objectionable odors, soil conditions that are harmful to crops, and degradation of underlying groundwater by overloading the shallow soil profile and causing waste constituents (organic carbon, nitrate, other salts, and metals) to percolate below the root zone. Ordinarily, it is reasonable to expect some attenuation of various waste constituents that percolate below the root zone within the vadose (unsaturated) zone. Specifically, excess nitrogen can be mineralized and denitrified by soil microorganisms, organic constituents (measured as both BOD and volatile dissolved solids) can be oxidized, and some salinity species will undergo cation exchange with clay molecules, effectively immobilizing them. However, given the shallow water table beneath the proposed land application sites, the limited depth of the vadose zone will offer limited potential for those forms of attenuation.

55. According to *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency (US EPA Publication No. 625/3-77-0007) (hereafter *Pollution Abatement*), in applying food-processing wastewater to land for biological treatment, the loading of BOD_5 should not exceed 100 lbs/acre/day (as a cycle average) to prevent nuisance odors. The proposed cycle average of 50 pounds per acre per day coupled with the odor prevention measures of this Order should effectively prevent such nuisance conditions.

    The RWD states that the expected peak daily BOD loadings of 775 pounds per acre per day are low enough to prevent odors and anaerobic soil conditions that can mobilize soil metals such as iron and manganese. The January 2006 RWD Addendum included an oxygen transfer model recommended in the California League of Food Processors *Manual of Good Practice for Land Application of Food Processing/Rinse Water*, and concluded that the silty clay soils at Ranch 71 have an instantaneous total oxygen demand capacity of 1,740 pounds per acre, and that the clay loam soils at Ranch 72 have an instantaneous total oxygen demand capacity of 2,300 pounds per acre. Although the model is detailed and well supported in the literature, it has not been scientifically validated by actual field studies or calibrated for use at the Ranch 71 or Ranch 72 sites based on site-specific data. Therefore, it is appropriate to limit the peak daily BOD loading to that which is achievable given current wastewater flows and the land currently available until the Discharger provides a site-specific demonstration that justifies a higher peak daily loading. Based on the cycle time and wastewater application rates provided in the RWD and a maximum BOD concentration of 1,200 mg/L, the Discharger should be able to consistently achieve a peak daily BOD loading of 350 pounds per acre per day without further treatment or dilution until the facility expands to the point where monthly average wastewater flows exceed 2.0 mgd.

56. Acidic and/or reducing soil conditions can be detrimental to land treatment system function, and may cause groundwater degradation. If the buffering capacity of the soil is exceeded and soil pH decreases below 5 or the soil becomes reducing, naturally occurring metals (including iron and manganese) may dissolve and degrade underlying groundwater. *Pollution Abatement* recommends that water applied to crops have a pH within 6.4 to 8.4 to protect crops. The pH of process wastewater from the paste line tends to be lower than 6.4. However, there is no indication that the long-term discharge to the Myers property has caused crop damage or violations of the Basin Plan water quality objective for chemical constituents in groundwater as related to agricultural uses

affected by pH. Additionally, soil pH at the proposed land application sites is moderately alkaline, and the wastewater will be diluted with fresh water prior to discharge. Therefore, the soils and underlying groundwater are expected to adequately buffer the discharge. Accordingly, this Order does not impose effluent limitations for pH.

57. Groundwater beneath the proposed new land application sites exceeds water quality objectives for salinity. Although the wastewater will be diluted with supplemental irrigation water, the dilution ratio will decrease as production increases while the amount of land available for irrigation remains constant. Based on the proposed flow limitations and recent wastewater salinity data, the flow-weighted average TDS concentration is estimated to increase from 700 mg/L at 2005 flows to 1,200 mg/L at full production (including consideration of dilution with supplemental irrigation water). Likewise, the estimated flow-weighted FDS concentration would increase from approximately 440 to 580 mg/L. Because of salts already present in the soil, evapoconcentration, leaching, and limited potential for vadose zone attenuation to remove both volatile and fixed dissolved solids, the proposed discharge poses a significant threat of further degradation of the underlying groundwater unless salinity loading to the land application sites is strictly controlled. Based on best professional judgment, 700 mg/L TDS is the highest flow-weighted concentration that can be allowed without risking further degradation of groundwater beneath the sites. Therefore, it is appropriate to impose effluent limitations on TDS.

58. As the facility operation expands and wastewater flows increase, the Discharger will need to either increase the land application area or take steps to reduce wastewater salinity to comply with the TDS limitations imposed by this Order. The Discharger already uses steam peeling instead of caustic peeling, which would generate approximately 79 tons of additional dissolved solids per year. However, this single pollution control method by itself is not sufficient to protect groundwater quality.

59. The *Salinity Source Reduction Plan* included in the January 2006 RWD Addendum proposed the following:

    a. Increase return of low salinity boiler condensate to the boiler from 68 percent to 88 percent. This would reduce salt usage for the water softener system, thereby reducing the mass of salt discharged by 12 tons per year. However, because the total mass of salt discharged each year is approximately 494 tons, this effort may not result in measurable improvements in effluent quality.

    b. Audit brine mixing, chemical usage for the clean in place systems, and product dumping practices for source reduction opportunities.

    c. Regenerate the water softener system with potassium chloride. This would reduce the mass of sodium discharged. Additionally, because potassium is a crop nutrient, the net mass of dissolved solids available to leach to groundwater would be reduced. The specific reductions associated with this measure were not included in the report.

    d. Evaluate the effectiveness of increasing boiler condensate return.

    e. Unspecified improvements to the Paste Line to reduce loss of solids.

f. Installation of new elevators and unloading flumes to reduce product losses (which currently account for over 40% of the wastewater salinity).

g. Addition of new clean water reuse systems to recycle pump seal and cooling tower water in one of the flume systems.

Additional measures not proposed or discussed in the RWD might include: segregating the highly saline boiler blowdown and water softener brine for off-site disposal or on-site evaporation, and conventional treatment of the organic waste stream to oxidize BOD (and thereby reduce the volatile and total dissolved solids concentrations).

It is appropriate for this Order to impose Effluent and Groundwater Limitations that are fully protective of groundwater quality. It is also appropriate to require that salinity reduction and control measures be implemented as needed to comply with those limitations, and that the Discharger monitor the effectiveness of all salinity reduction measures implemented.

60. Pursuant to California Water Code Section 13263(g), discharge is a privilege, not a right, and issuance of this Order does not create a vested right to continue the discharge. Failure to provide best practicable treatment and control; preclude conditions that threaten pollution, degradation, or nuisance; and protect groundwater quality will be sufficient reason to enforce this Order, modify it, or revoke it and prohibit further discharge.

Basin Plan and Beneficial Uses

61. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition revised September 2004, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Board). Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.

62. Surface water drainage is to Cortina Creek, which is tributary to the Colusa Basin Drain. The Basin Plan designates the beneficial uses of the Colusa Basin Drain as agricultural supply; water contact recreation including canoeing and rafting; warm freshwater habitat; cold freshwater habitat; migration of warm water aquatic organisms; spawning, reproduction, and/or early development of warm water aquatic organisms; and wildlife habitat.

63. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

64. State Board Resolution No. 68-16 prohibits degradation of groundwater quality unless it has been shown that:

a. The degradation is consistent with the maximum benefit to the people of the State;

b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and

d. The discharger employs best practicable treatment and control to minimize degradation.

65. The Discharger has implemented some BPTC measures to reduce the salinity of the discharge and plans to further reduce salinity through source control. However, based on the RWD, at full facility expansion the wastewater will likely exceed applicable water quality limits for several salinity constituents, even after full implementation of the proposed source reduction. Initially, dilution with fresh water may result in a flow-weighted TDS concentration as low as 700 mg/L. However, as the facility expands and wastewater flows increase to the proposed maximum flow of 4.0 mgd during the fresh pack season, the use of supplemental water for irrigation will decline, and the flow-weighted TDS concentration could increase to 1,200 mg/L or more. There are several other BPTC methods available to further reduce the potential for groundwater degradation, which the Discharger did not propose to implement. These include:

a. Obtain additional land to allow further dilution of the waste in combination with supplemental fresh water for crop irrigation;

b. Wastewater aeration to reduce BOD and TDS concentrations; and

c. Segregation and separate handling of high-salinity waste streams.

The RWD did not present a valid analysis of discharge- and site-specific information to show that the discharge as proposed would not further degrade the underlying groundwater. Additionally, the RWD did not demonstrate that further degradation would not impact the beneficial uses of the groundwater, or that such degradation is in the best interest of the people of the State. Consequently, the Discharger has not provided the required demonstration pursuant to State Board Resolution No. 68-16 to be allowed to cause groundwater degradation, and therefore none is authorized.

Other Regulatory Considerations

66. Federal regulations for storm water discharges promulgated by the U.S. Environmental Protection Agency (40 CFR Parts 122, 123, and 124) require specific categories of facilities which discharge storm water to obtain NPDES permits. The Discharger does not discharge storm water to surface waters, and is therefore not required to obtain coverage under the State Board's Water Quality Order No. 97-03-DWQ.

67. Section 13267(b) of California Water Code provides that: *"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of*

these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."

The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2006-0047 are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

68. The processing plants have been in operation since 1982 and 2002, and their continued operation is therefore exempt from the provisions of the California Environmental Quality (CEQA). On 1 May 2006, the Colusa County Planning Department certified an Initial Study and Negative Declaration for construction of the new conveyance system and land application of wastewater at Ranch 71 and Ranch 72, and issued Use Permit No. 05-4-1 for the project. Conditions of approval relevant to this Order require the following:

    a. The Discharger must conduct all operations as described in the project description;

    b. The Discharger must comply with the 2006 Cropping Irrigation Management Plan included as an Appendix to the Initial study (and incorporated into the RWD), and shall submit a revised Cropping and Irrigation plan annually;

    c. The Discharger must become a member of the Underground Service Alert system before commencing use of the new wastewater distribution pipeline.

    With the exception of item c above, this Order incorporates substantially similar requirements.

69. The action to adopt revised waste discharge requirements for the facility is exempt from the provisions of CEQA, in accordance with Title 14 CCR, Section 15301.

Public Notice

70. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

71. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

72. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, Order Nos. 93-089 and 5-01-273 are rescinded, and SK Foods and Colusa County Canning Company, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

Note:

1. *Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.*

A. Discharge Prohibitions:

1. Land application of wastewater to areas other than Ranch 71 and Ranch 72 (as shown on Attachment A) is prohibited.

2. Land application of wastewater to any field that does not have a fully functional tailwater return and runoff control system is prohibited.

3. Bypassing any treatment system existing prior to, or installed after, adoption of this Order is prohibited (including the screen system).

4. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

5. Discharge of irrigation tailwater or storm water runoff from any of the designated land application areas to any off-site area or drainage course is prohibited.

6. Discharge of waste classified as hazardous, as defined in Section 2521(a) of Title 23, CCR, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.

B. Discharge Specifications:

1. During the months of **July through October**, the monthly average wastewater flow shall not exceed 4.0 mgd.

2. During the months of **November through June**, the monthly average wastewater flow shall not exceed 0.20 mgd, and the total cumulative flow shall not exceed 20.0 MG.

3. Objectionable odors originating from the wastewater pond and all land application areas shall not be perceivable beyond the property limits.

4. As a means of discerning compliance with Discharge Specification No. 3, the dissolved oxygen content in the upper one foot of any pond used to treat or store wastewater shall not be less than 1.0 mg/l.

5. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.

6. All land application areas shall be managed to prevent breeding of mosquitoes and other vectors. Specifically:
   a. All wastewater applied to land must infiltrate completely or be returned to the irrigation system as tailwater within 24 hours.
   b. Low-pressure pipelines, unpressurized pipelines, and ditches that are accessible to mosquitoes shall not be used to store wastewater.
   c. Irrigation and tailwater ditches shall be maintained essentially free of emergent, marginal, and floating vegetation

7. All wastewater treatment and storage ponds shall also be managed to prevent breeding of mosquitoes. Specifically:
   a. Erosion control measures shall be implemented to minimize small coves and irregularities around the perimeter of the water surface.
   b. Weeds within and around the perimeter of the pond shall be minimized through control of water depth, harvesting, or herbicides.
   c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

8. All treatment, storage, and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

9. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.

10. The facility shall have sufficient treatment, storage, and disposal capacity to accommodate allowable wastewater flow and design seasonal precipitation during the winter months. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

11. Freeboard in any wastewater pond shall never be less than two feet as measured from the water surface to the lowest point of overflow.

12. On or about **15 October** of each year, the wastewater storage pond shall be empty to ensure compliance with Discharge Specifications B.10 and B.11.

13. The Discharger shall not operate the retail products line unless the wastewater storage pond has more than two feet of freeboard and climate conditions are such that any irrigation performed to dispose of wastewater will not violate other requirements of this Order.

14. Neither the treatment nor the discharge of waste shall cause a condition of nuisance or pollution as defined by the California Water Code, Section 13050.

C. Effluent Limitations

1. **Effective immediately**, the discharge of wastewater combined with supplemental irrigation water to the land application sites shall not exceed 750 mg/l total dissolved solids as a flow-weighted yearly average, or such concentration as the Discharger determines necessary to ensure compliance with the Groundwater Limitations.

2. **Effective 1 July 2008**, the discharge of wastewater combined with supplemental irrigation water to the land application sites shall not exceed 700 mg/l total dissolved solids as a flow-weighted yearly average, or such concentration as the Discharger determines necessary to ensure compliance with the Groundwater Limitations.

3. The discharge of wastewater combined with supplemental irrigation water to the land application sites shall not exceed 50 mg/L total nitrogen as a flow-weighted yearly average.

4. Unless expressly authorized by the Executive Officer pursuant to Provision G.2, the maximum BOD_5 loading to each land application area irrigation check (including the designated solids application area) shall not exceed any of the following:

   a. 350 lbs/acre on any single day;

   b. 100 lbs/acre/day as a cycle average; and

   c. The daily and cycle average loading rate that ensures compliance with Discharge Specifications B.3 and B.14 and the Groundwater Limitations.

   Loading calculations shall be performed as specified in the attached Monitoring and Reporting Program No. R5-2006-0047, which is a part of this Order.

5. The total nitrogen loading to each land application area irrigation check (including the designated solids application area) shall not exceed the agronomic rate for plant available nitrogen (PAN) for the type of crop to be grown, as specified in the most recent edition of the Western Fertilizer Handbook. Unless expressly authorized by the Executive Officer pursuant to Provision G.2, PAN shall be calculated as 83 percent of the total nitrogen content of the waste plus the total nitrogen contribution from supplemental fertilizers.

D. Land Application Area Specifications

1. Hydraulic loading of wastewater and supplemental fresh water to the land application areas shall be at rates designed to minimize percolation of waste constituents below the evaporative and root zones, except as needed to promote surface soil chemistry that is consistent with sustainable agricultural land uses.

2. The Discharger shall maximize use of the available land application areas to minimize waste constituent loading rates.

3. Crops shall be grown on the land application areas each year. Crops shall be selected based on nutrient uptake capacity, tolerance of anticipated soil conditions, water needs, and

evapotranspiration rates. All crops shall be harvested and removed from the irrigation areas at least once per year.

4. At a minimum, there shall be a 12-day drying/resting period between wastewater applications.

5. The irrigation system shall be designed and managed to ensure even application of wastewater over each irrigation field.

6. Irrigation with wastewater shall not be performed within 24 hours before a predicted storm, during precipitation, or within 24 hours after the end of any precipitation event, nor shall it be performed when the ground is saturated.

7. The irrigation force main shall be completely flushed with fresh water immediately after the flow of wastewater to a particular branch of the pipeline ceases, and as often as needed at other times to ensure continuous compliance with Discharge Specification B.3.

8. There shall be no standing water in any portion of the irrigated fields more than 24 hours after application of wastewater ceases.

9. The discharge shall not cause the buffering capacity of the soil profile to be exceeded nor shall it cause the soil to become reducing.

10. The Discharger shall provide and maintain the following setbacks for all wastewater land application areas:

Setback Definition	Surface Irrigation Setback (feet)
Edge of irrigated area[1] to public property (e.g., street)	10
Edge of irrigated area to other agricultural property	0
Edge of irrigated area to occupied residence	50
Edge of irrigated area to irrigation well	50 [2]
Edge of irrigated area to domestic well	100 [2]

[1] As defined by the wetted area produced during irrigation.
[2] Unless otherwise expressly approved by the Executive Officer.

11. Application of process wastewater shall only occur where checks are graded to provide uniform water distribution, minimize ponding, and provide complete tailwater control.

12. Check runs shall be no longer, and slopes shall be no greater, than that which permits uniform infiltration and maximum practical irrigation efficiency.

13. Tailwater ponds and all ditches shall be maintained free of emergent, marginal, and floating vegetation.

E. Solids Disposal Requirements:

1. Collected screenings, sludge, and other solids generated at the processing facility shall be disposed of in a manner approved by the Executive Officer, and, if disposed of off-site, in compliance with the *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Solids shall not be applied to land within 24 hours before predicted precipitation, during periods of precipitation, within 24 hours after precipitation, or when the land application area is saturated.

3. Solids shall be incorporated into the soil by disking within 24 hours of application.

4. A winter crop shall be grown on the solids application area each year. The winter crop shall be selected based on nutrient uptake capacity, tolerance of anticipated soil conditions, water needs, and evapotranspiration rates. All crops shall be harvested and removed from the solids application area prior to the beginning of the next fresh pack season.

5. The total annual nitrogen loading rate from solids, wastewater, and any other source shall not exceed the agronomic rate for nitrogen, or a total thickness of two inches, whichever is more restrictive.

6. Any proposed change in solids use or disposal practice shall be reported to the Executive Officer at least 90 days in advance of the change.

F. Groundwater Limitations:

The discharge shall not cause underlying groundwater to contain any chemical constituent in concentrations greater than background groundwater quality.

G. Provisions:

1. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision G.3:

    a. **By 30 June 2006**, the Discharger shall submit a *Vadose Zone Monitoring Workplan* that describe a proposed system for collecting representative soil pore water samples from the vadose zone beneath the Ranch 71 and Ranch 72 land application sites. The workplan shall specify design details for the monitoring system, proposed vadose zone monitoring locations, and proposed sampling techniques designed to ensure that representative samples of sufficient volume are obtained. The supporting rationale shall be documented.

    b. By **30 July 2006**, the Discharger shall submit a *Monitoring Well Installation Workplan.* The workplan shall describe the proposed installation of additional groundwater monitoring sufficient to completely characterize groundwater gradient and groundwater quality within and downgradient of Ranch 71 and Ranch 72. Monitoring wells shall be constructed to yield

representative samples from the uppermost layer of the uppermost aquifer and to comply with applicable well standards. The workplan shall be consistent with, and include the items listed in, the first section of Attachment F, which is attached hereto and made part of this Order by reference. It shall also include a preliminary identification and assessment of nearby water supply wells and their effects on groundwater elevations and gradients at the facility site.

c. **By 30 November 2006**, the Discharger shall submit a *Vadose Zone Monitoring System Completion Report* that describes the installation of the approved vadose zone monitoring system and justifies any deviation from the approved workplan.

d. By **30 November 2006**, the Discharger shall submit a *Monitoring Well Installation Report* that describes the installation of groundwater monitoring wells and contains the items found in the second and third sections of Attachment F.

e. By **30 December 2006**, the Discharger shall submit a *Flood Protection Improvements Completion Report* that describes the improvements to the Ranch 71 flood control berm and demonstrates that the minimum elevation of the berm crest is 47 feet above mean sea level.

f. By **30 December 2006**, the Discharger shall submit a *Preliminary Salinity Source Reduction Completion Report* that documents full implementation of the salinity reduction measures described in Findings 58.a through 58.g, inclusive, of this Order and quantitatively evaluates the effectiveness of each based on a separate short-term monitoring program specifically developed for that purpose. The report shall describe in detail all facility and operational modifications made.

g. By **30 December 2006**, the Discharger shall submit a *Background Groundwater Quality and Groundwater Degradation Assessment Repor*t for the processing facility and the Myers and Reynolds Properties. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of all monitoring data (including data obtained prior to adoption of this Order) and calculation of the concentration in background monitoring well(s). This determination of background groundwater quality shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on all available data. For each monitoring parameter/constituent, the report shall compare the measured concentration in each compliance monitoring well with the proposed background concentration.

h. **Within 7 days** of any violation of Discharge Specification B.4 that lasts longer than two consecutive days, the Discharger shall submit a *Dissolved Oxygen Non-Compliance Report* that documents the specific measures that have been, or will be, taken to come into compliance with Discharge Specification B.4 and maintain continuous compliance with that requirement.

2. If the Discharger wishes to use pilot testing to demonstrate that Effluent Limitations other than those specified in this Order are justified, such testing shall be performed pursuant to an approved *Land Application Pilot Test Workplan*. The pilot test area must be part of the land application

areas regulated under this Order. The total area shall not exceed 20 acres, and the test site shall be selected to a) minimize the proximity to occupied residences, and b) be representative of the soil and groundwater conditions at the land application sites. For the purpose of the pilot test only, the Executive Officer may temporarily waive one or more of the Effluent Limitations for the pilot test site.

The pilot test shall include submittal of a technical report that includes site-specific chemical and physical test data. The data shall be used to support any statements regarding waste character and numerical models used to calculate acceptable loading rates. Numerical models, if used, shall be supported by a thorough description of the model, field testing validation, calibration to actual observed conditions, analysis of applicability to the site, limitations of the model, and error analysis. The workplan shall specify and justify the proposed sampling and testing program and modeling approach.

3. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological sciences, shall be prepared by, or under the direction of, persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with section 415 and 3065 of Title 16, CCR, all technical reports, must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

4. The Discharger shall comply with Monitoring and Reporting Program No. R5-2006-0047, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.

5. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

6. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving the processing facility or land application areas that is used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Regional Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

7. The Discharger shall submit to the Regional Board on or before each compliance report due date the specified document, or if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is reported, then the Discharger shall state the reasons for noncompliance and shall provide a schedule to come into compliance.

8. The Discharger shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge.

9. In the event of any change in control or ownership of the facility or land application areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

10. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

11. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel at the facility shall be familiar with its contents.

12. The Regional Board will review this Order periodically and will revise requirements when necessary.

I, Pamela C. Creedon, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 5 May 2006.

_____

PAMELA C. CREEDON, Executive Officer

ALO:05/19/2006
Late Revisions

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2006-0047
FOR
SK FOODS AND COLUSA COUNTY CANNING COMPANY
WILLIAMS TOMATO PROCESSING FACILITY
COLUSA COUNTY

The Discharger shall comply with this MRP, issued pursuant to Water Code Section 13267, which describes requirements for monitoring industrial process wastewater effluent, ponds, solids, land application areas, and groundwater. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are field-calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

GENERAL POND MONITORING

Each wastewater and tailwater pond shall be monitored as described below. If any pond is dry, the monitoring report shall so state.

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Dissolved Oxygen [1]	mg/L	Grab	Weekly	Monthly
Freeboard	0.1 feet	Measurement	Weekly	Monthly
Odors	--	Observation	Weekly	Monthly
Berm/levee condition	--	Observation	Monthly	Monthly

[1] Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet. Samples shall be collected between 0700 and 0900 hours.

EFFLUENT MONITORING

Effluent samples shall be collected just prior to discharge to the land application areas. Sampling is not required during periods when no wastewater is discharged to the land application areas. Grab samples collected from a pipeline or sump pit will be considered representative. At a minimum, the Discharger shall monitor the wastewater as follows:

Constituent/Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
pH	pH units	Grab	Weekly	Monthly
Total Dissolved Solids	mg/L	Grab	Weekly	Monthly
Fixed Dissolved Solids	mg/L	Grab	Weekly	Monthly
Suspended Solids	mg/L	Grab	Weekly	Monthly
Settleable Solids	ml/L	Grab	Weekly	Monthly
BOD_5 [1]	mg/L	Grab	Weekly	Monthly
Total Kjeldahl Nitrogen	mg/L	Grab	Weekly	Monthly
Nitrate Nitrogen	mg/L	Grab	Weekly	Monthly
Ammonia Nitrogen	mg/L	Grab	Weekly	Monthly
Standard Minerals [2]	mg/L	Grab	Monthly	Monthly

[1] 5-day, 20ºC Biochemical Oxygen Demand

[2] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, bromide, calcium, chloride, fluoride, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and total hardness as $CaCO_3$.

SUPPLEMENTAL IRRIGATION WATER MONITORING

Samples of supplemental irrigation water shall be collected at the wellhead. Sampling is not required during periods when no water is discharged to the land application areas. Grab samples collected from a pipeline will be considered representative. At a minimum, the Discharger shall monitor the supplemental irrigation supply water as follows:

Constituent/Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
pH	pH units	Grab	Monthly	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
Fixed Dissolved Solids	mg/L	Grab	Monthly	Monthly
Total Kjeldahl Nitrogen	mg/L	Grab	Monthly	Monthly
Nitrate Nitrogen	mg/L	Grab	Monthly	Monthly
Standard Minerals [1]	mg/L	Grab	Monthly	Monthly

[1] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, bromide, calcium, chloride, fluoride, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and total hardness as $CaCO_3$.

FLOW MONITORING

The Discharger shall monitor wastewater and supplemental irrigation water flows as follows:

Flow Source	Units	Type of Measurement	Monitoring Frequency	Reporting Frequency
Processing plant to wastewater pond	gpd [1]	Meter Observation	Daily [1]	Monthly
Daily discharge to irrigation areas: Wastewater Supplemental irrigation water	gpd	Meter Observation	Daily [2]	Monthly
Daily subtotal to each irrigation field or check: Wastewater Supplemental irrigation water	gpd and inches	Meter Observation/ Calculation	Daily [2]	Monthly

[1] Report as total daily flow from the flow source to the pond.

[2] Calculated based on total daily flows, flow rates, checks in use, and length of set time for each check.

SOLIDS MONITORING

Samples of solids removed from process wastewater shall be collected just prior to discharge to the solids application area. Sampling is not required during periods when no solids are discharged to the land application areas. Grab samples collected from a bin or transport vehicle will be considered representative. At a minimum, the Discharger shall monitor the solids as follows:

Constituent/Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
Total weight discharged	tons [3]	Calculated	Monthly	Monthly
Moisture	percent	Grab	Monthly	Monthly
Total organic carbon	mg/Kg [4]	Grab	Monthly	Monthly
Total dissolved solids	mg/Kg [4]	Grab	Monthly	Monthly
Total nitrogen	mg/Kg [4]	Grab	Monthly	Monthly
Salts [1]	mg/Kg [4]	Grab	Semi-Annually	Monthly
Metals [2]	mg/Kg [4]	Grab	Semi-Annually	Monthly

[1] Include at least sodium**,** chloride, sulfate, potassium, and calcium**.**

[2] Include at least magnesium, phosphorus, arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc).

[3] May be estimated based on volume (cubic yards) and moisture content results.

[4] Results shall be reported on both a wet weight and dry weight basis**.**

LAND APPLICATION AREA MONITORING

A. Daily Field Inspections

The Discharger shall inspect the land application areas at least once daily prior to and during irrigation events, and observations from those inspections shall be documented for inclusion in the monthly monitoring reports. The following items shall be documented for each check or field to be irrigated on that day:

1. Evidence of erosion;
2. Berm condition;
3. Condition of each standpipe and flow control valve (if applicable);
4. Proper use of valves;
5. Condition of head ditch;
6. Soil saturation;
7. Ponding;
8. Tailwater ditches and potential runoff to off-site areas;
9. Potential and actual discharge to surface water;
10. Accumulation of organic solids in ditches and at soil surface;
11. Soil clogging;
12. Odors that have the potential to be objectionable at or beyond the property boundary; and
13. Insects.

The Discharger shall monitor the dissolved oxygen content of the wastewater at least once per day at the following locations:

1. The point of discharge from the force main into the head ditch;
2. The downstream end of the head ditch;
3. Any location where water is standing longer than six hours after delivery to the field has stopped.

Temperature; wind direction and relative strength; and other relevant field conditions shall also be observed and recorded. The notations shall also document any corrective actions taken based on observations made, including fresh water flushing of the force main and head ditches. A copy of entries made in the log during each month shall be submitted as part of the Monthly Monitoring Report.

B. Routine Monitoring

The Discharger shall perform the following routine monitoring and loading calculations during all months when land application occurs, and shall present the data in the Monthly and Annual Monitoring Reports.

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Precipitation	0.1 in.	Rain Gauge [1]	Daily	Monthly, Annually
Irrigation fields and checks receiving wastewater	--	Observation	Daily	Monthly, Annually
Hydraulic loading rate: Wastewater Fresh water [6] Total	gal/in.	Calculated [2]	Daily	Monthly, Annually
BOD_5 loading rate Peak daily Cycle average	lb/ac/day	Calculated [2, 3]	Daily	Monthly, Annually
Cumulative nitrogen loading rate Wastewater Fresh water Other sources Total	lb/ac	Calculated [2, 4]	Daily	Monthly, Annually
Cumulative total dissolved solids loading rate Wastewater Fresh water Total	lb/ac	Calculated [2, 4]	Monthly	Monthly, Annually
Cumulative (to date) flow-weighted total dissolved solids concentration (combined wastewater and fresh water)	mg/L	Calculated [2, 4]	Monthly	Monthly, Annually

1 Data obtained from the nearest National Weather Service rain gauge is acceptable.

2 Rate shall be calculated for each irrigation check.

3 BOD_5 shall be calculated using the daily applied volume of wastewater, actual application area, and the average of the three most recent BOD_5 results.

4 Total nitrogen and TDS loading rates shall be calculated as a flow-weighted average using the applied volume of wastewater, actual application area, and effluent monitoring results.

5 Loading rates for supplemental nitrogen shall be calculated using the actual load and the application area.

6 Identify supply well used for each check on each day.

C. Vadose Zone Monitoring

The Discharger shall install a vadose zone monitoring system within the Ranch 71 and Ranch 72 land application areas. The monitoring system shall consist of lysimeters designed to sample soil pore liquid within the vadose zone but no deeper than five feet below ground surface at each sampling location. For each site, a minimum of two lysimeters shall be installed in different irrigation checks at locations designed to represent a "worst case" scenario (e.g., in locations that tend to infiltrate faster or those potentially subject to ponding) of the check. The lysimeters shall be designed to provide sufficient sample volume to perform the analytical testing program specified below, and shall be completely purged after each sampling event.

As described in the Provisions section of this Order, the Discharger shall propose the type and locations, as well as methods to be used to purge and sample the lysimeters. These techniques shall be implemented upon approval by the Executive Officer. Lysimeter samples shall be analyzed using standard EPA methods. The vadose zone monitoring program shall consist of at least the following:

Constituent	Units	Type of Sample	Sampling and Reporting Frequency
Date(s) of sampling	--	--	Second and fourth quarters
Volume removed [1]	mL	--	Second and fourth quarters
pH	--	Grab	Second and fourth quarters
Total nitrogen	mg/L	Grab	Second and fourth quarters
Total dissolved solids	mg/L	Grab	Second and fourth quarters
Fixed dissolved solids	mg/L	Grab	Second and fourth quarters
Chloride	mg/L	Grab	Second and fourth quarters
Iron	ug/L	Grab	Second and fourth quarters
Manganese	ug/L	Grab	Second and fourth quarters

[1] Pan lysimeters, if used, must be completely drained.

D. Annual Soil Sampling

The Discharger shall establish permanent representative soil monitoring locations as follows: three background locations outside of the land application areas (i.e., areas of the site that are not within irrigation checks) and eight locations within each of the land application areas. Sampling locations, including background locations, shall be distributed to be representative of each area and predominant soil types. Soil samples shall be collected from each sampling location at the following depth intervals: 0.5 to 1 feet, 2 to 3 feet and 4 to 5 feet below the ground surface. Each 12-inch sample shall be thoroughly mixed to create a composite sample representative of the depth interval, and shall be analyzed as follows:

Constituent/Parameter	Units	Sampling and Reporting Frequency [3]
Soil Classification (USCS and USDA)	--	Annually
Total Solids	% total weight	Annually
Total Alkalinity [1]	mg/Kg as $CaCO_3$	Annually
pH	pH Units	Annually
Cation Exchange Capacity [1]	meq/100 grams	Annually
Nitrate + Nitrite Nitrogen [1, 2]	mg/Kg, mg/L	Annually
Total Kjeldahl Nitrogen [1, 2]	mg/Kg, mg/L	Annually
Total Nitrogen [1, 2]	mg/Kg, mg/L	Annually
Total Dissolved Solids [1,2]	mg/Kg, mg/L	Annually
Electrical Conductivity [4]	umhos/cm	Annually
Calcium [2]	mg/L	Annually
Magnesium [2]	mg/L	Annually
Sodium [2]	mg/L	Annually
Chloride [2]	mg/L	Annually
Iron [2]	mg/L	Annually
Manganese [2]	mg/L	Annually

1 To be reported on a dry weight basis; show calculations.

2 Analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.

3 Samples shall be collected in the spring (second quarter). Sampling must occur at the same time each year.

4 Analysis shall be performed on a saturated paste extract.

GROUNDWATER MONITORING

The following groundwater monitoring requirements apply to existing monitoring wells LF-1, MW-4 through MW-12 inclusive, MW-16 through MW-18 inclusive, and MW-20 through MW-27 inclusive, and any other wells subsequently installed to monitor the discharge areas. Prior to construction and/or sampling of any groundwater monitoring wells, the Discharger shall submit plans and specifications to the Board for review and approval. Once installed, all new wells shall be added to the MRP and shall be sampled and analyzed according to the schedule below.

Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected and analyzed using standard EPA methods. Groundwater monitoring shall include, at a minimum, the following:

Constituent/Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
Depth to groundwater	0.01 feet	Measurement	Monthly [4]	Quarterly
Groundwater elevation [1]	feet	Calculated	Monthly [4]	Quarterly
Gradient magnitude	feet/feet	Calculated	Monthly [4]	Quarterly
Gradient direction	degrees	Calculated	Monthly [4]	Quarterly
pH	pH Units	Grab	Quarterly	Quarterly
Total dissolved solids	mg/L	Grab	Quarterly	Quarterly
Fixed dissolved solids	mg/L	Grab	Quarterly	Quarterly
Total Kjeldahl nitrogen	mg/L	Grab	Quarterly	Quarterly
Nitrate nitrogen	mg/L	Grab	Quarterly	Quarterly
Dissolved iron [2]	mg/L	Grab	Quarterly	Quarterly
Dissolved manganese [2]	mg/L	Grab	Quarterly	Quarterly
Total coliform organisms	MPN/100 mL	Grab	Quarterly	Quarterly
Standard Minerals [3]	mg/L	Grab	Quarterly	Quarterly

[1] Groundwater elevation shall be determined based on depth-to-water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

[2] Samples shall be filtered with a 0.45-micron filter prior to sample preservation.

[3] Standard Minerals shall include, at a minimum, the following elements/compounds: pH, boron, bromide, calcium, chloride, fluoride, magnesium, phosphorus, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and total hardness as $CaCO_3$.

[4] After twelve consecutive months of monthly monitoring, the monitoring frequency shall be quarterly.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g. pond, effluent, soil, groundwater), sampling location, and the reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all groundwater monitoring reports shall be prepared under the direct supervision of a California-registered geologist or engineer and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following sampling** (i.e., the January report is due by 1 March). Monthly Monitoring Reports

shall be submitted regardless of whether there is any process wastewater generated. At a minimum, the reports shall include:

1. Results of pond, effluent, supplemental irrigation supply, flow, solids, and all land application area monitoring. Data shall be presented in tabular format.

2. Daily precipitation data in tabular form accompanied by starting and ending dates of irrigation for each field or check.

3. Daily field inspection reports, including records of the date, time, and volume of fresh water used to flush the force main and head ditches; and dissolved oxygen monitoring results

4. A comparison of monitoring data to the discharge specifications and applicable limitations and an explanation of any violation of those requirements.

5. When requested by staff, copies of laboratory analytical report(s).

6. Calibration log(s) verifying calibration of any field monitoring instruments (e.g., DO, pH, and EC meters) used to obtain data.

7. Daily discharge volumes and acres irrigated shall be tabulated. The report shall include a discussion of the discharge volumes and irrigation practices used (water source, method of application, application period/duration, drying times, etc.) for each check or group of checks utilized during the month. Hydraulic loading rates (inches/acre/month) shall be calculated.

8. Maximum daily BOD_5 loading rates (lbs/acre/day) shall be calculated for each irrigation check using the total volume applied on the day of application, estimated application area, and a running average of the three most recent results of BOD_5 for the applicable source water, which also shall be reported along with supporting calculations. Cycle average BOD_5 loading rates shall be calculated using the total volume applied on the day of application, the number of days between applications, the total application period, application area, and a running average of the three most recent results of BOD_5 for the applicable source wastewater.

9. Total nitrogen and TDS loading rates (lbs/acre/month) shall be calculated for each irrigation check on monthly basis using the daily applied volume of wastewater, daily application area, and the most recent monitoring results, which shall also be reported along with supporting calculations.

10. Nitrogen loading rates for other sources (i.e., fertilizers) shall be calculated for each irrigation check on a monthly basis using the daily applied load and the estimated daily application area.

11. Cumulative nitrogen and TDS loading rates for each irrigation check for the calendar year to date shall be calculated as a running total of monthly loadings to date from all sources.

12. Flow-weighted average TDS concentrations shall be calculated based on year-to-date flow, effluent, and supplemental irrigation water monitoring results.

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for groundwater monitoring such that samples are obtained approximately every three months. Groundwater monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st each year). The Groundwater Monitoring Reports shall include the following:

1. Results of groundwater monitoring.

2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDRs, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged.

3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any.

4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal tends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).

5. A comparison of monitoring data to the groundwater limitations and an explanation of any violation of those requirements.

6. Summary data tables of historical and current water table elevations and analytical results.

7. A scaled map showing relevant structures and features of the facility, the land application area and irrigation check boundaries, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.

8. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Monitoring Report

An Annual Report shall be prepared as the fourth quarterly monitoring report. The Annual Report shall include all monitoring data required in the monthly/quarterly schedule. The Annual Report shall be submitted to the Regional Board by **1 February** each year. In addition to the data normally presented, the Annual Report shall include the following:

1. Tabular and graphical summaries of historical monthly total loading rates for water (hydraulic loading in gallons and inches), BOD, total nitrogen, and total dissolved solids.
2. The flow-weighted average TDS concentration shall be calculated based on flow, effluent, and supplemental irrigation water monitoring results for the year.
3. A mass balance relative to constituents of concern and hydraulic loading along with supporting data and calculations. The report shall describe the types of crops planted and dates of planting and harvest for each crop.
4. For each violation of the Effluent Limitations of this Order, the report shall describe in detail the nature of the violation, date(s) of occurrence, cause(s), mitigation or control measures taken to prevent or stop the violation, and additional operational or facility modifications that will be made to ensure that the violation does not occur in the following year.
5. A narrative description of the annual soil monitoring program and a map of sampling locations.
6. Tabular and graphical summaries of historical soil analytical results for all monitored constituents and parameters.
7. Tabular and graphical summaries of historical vadose zone analytical results for all monitored constituents and parameters.
8. An evaluation of groundwater quality at the processing facility and the Ranch 71 and Ranch 72 land application areas. This determination shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on all available data. For each monitoring parameter/constituent, the report shall compare the measured concentration in each compliance monitoring well with the background concentration. For the purpose of this evaluation the Discharger shall use data from monitoring wells LF-1, MW-4, MW-8, MW-9, MW-11, MW-12, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, and any other wells subsequently installed for the purpose of monitoring those areas.
9. An evaluation of soil and vadose zone monitoring data based on current and historical data including evidence of waste constituent migration, the effectiveness of land treatment, potential for groundwater degradation, and recommendations for operational modifications to reduce waste constituent migration.
10. A comprehensive evaluation of the effectiveness of the past year's wastewater application operation in terms of odor control, including consideration of application management practices (i.e.: waste constituent and hydraulic loadings, application cycles, drying times, and cropping practices), soil profile monitoring data and groundwater monitoring data.
11. A narrative description of solids disposal practices, including the name and contact information for each disposal facility and the quantity disposed.
12. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.

13. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the certification statement by the Discharger or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

5 May 2006
_____
(date)

ALO:5/19/2006

INFORMATION SHEET

ORDER NO. R5-2006-0047
SK FOODS AND COLUSA COUNTY CANNING COMPANY
WILLIAMS TOMATO PROCESSING FACILITY
COLUSA COUNTY

SK Foods owns and operates the Colusa County Canning Company facility in Williams, Colusa County. The Discharger processes tomatoes and tomato products intermittently during the year. During the fresh pack season (approximately July through October), the tomato paste line produces tomato paste. The retail products line makes canned diced tomatoes, whole tomatoes, and tomato juice products processing fresh tomatoes during the fresh pack season and remanufacturing previously processed tomatoes at other times.

Process wastewaters are commingled and discharged to a sump. The wastewater passes through a series of screens prior to discharge to land to irrigate crops. Screened process wastewater from the paste line has been discharged to a 656-acre farm owned by F.J. Myers, LLC since 1982. Wastewater from the retail products line has been discharged to a 145-acre farm owned by Claire Reynolds since 2002.

Process wastewater flows vary during the year and from year to year depending on crop yield. For the paste line, monthly average flows ranged from 0.8 to 1.9 mgd, with an approximate mean of 1.2 mgd between 1982 and 2005. For the three years of retail line operation (2002, 2004, and 2005), monthly average flows ranged from 5,000 to 24,000 gpd.

The Discharger plans to cease the discharge to the Myers and Reynolds properties and has purchased two properties, Ranch 71 (643 acres) and Ranch 72 (229 acres), for land application purposes. A new pump station will be constructed, and screened process wastewater will be conveyed to Ranch 71 and Ranch 72 by a new force main to head ditches, from where it will be delivered to the fields by ridge and furrow irrigation.

The Discharger proposes to increase production and wastewater flows to 4.0 mgd during the fresh pack season. Off-season flows would average 200,000 gpd for 100 days per year. During the off-season, process wastewater will be stored in the 2.7-million gallon wastewater storage pond between irrigation events. During the fresh pack season, approximately four inches of water will be applied every 15 days. Supplemental irrigation water will be required during the spring and summer, but will decrease as plant production (and wastewater flow rates) increases.

Groundwater is generally encountered at approximately one to eight feet below the ground surface, and the groundwater flow direction is generally toward the east. However there is a cone of depression centered on the western boundary of Ranch 72, where there is an agricultural supply well. The cone of depression is approximately 20 feet deep and appears to capture shallow groundwater beneath the entire Ranch 72 site, as well as the Myers and Reynolds properties. Recent groundwater monitoring data indicate the following:

1. It appears that the wastewater storage pond at the processing facility has not degraded groundwater quality.

2. It appears that discharges to the Reynolds property have caused increases in conductivity and concentrations of dissolved solids, sodium, chloride, iron, and sulfate. The increases in sodium may constitute pollution.

3. It appears that discharges to the southern portion of the Myers property have not caused increases in concentrations of waste constituents in groundwater, but discharges to the northern portion of the Myers property may have caused increases in conductivity and concentrations of dissolved solids, sodium, chloride, iron, and manganese. The increases in sodium, iron, and manganese may constitute pollution.

The Discharger installed monitoring wells at the Ranch 71 and Ranch 72 sites in mid-2005, and has been sampling those wells monthly to establish baseline (pre-discharge) groundwater quality for those sites. The available data indicate that the baseline (pre-discharge) groundwater quality beneath the proposed land application sites exceeds the limits for conductivity, dissolved solids, nitrate, sodium, chloride, and sulfate used to apply applicable water quality objectives.

The proposed Ranch 71 and Ranch 72 land application sites are not ideal for land application of wastewater because of the extremely shallow water table. The underlying principle of land application is to beneficially reuse wastewater and the plant nutrients that it contains. However, in order to ensure that this beneficial reuse complies with State Water Board Resolution No. 68-16, land application may not cause unreasonable degradation of groundwater quality. Under ideal circumstances, soils within the land application area provide a matrix for biodegradation of the organic components of the wastewater (measured as BOD), create conditions conducive for transformation of organic nitrogen to plant available nitrate, create conditions conducive for denitrifying excess nitrate so that it does not percolate to the water table, provide pH buffering, and attenuate inorganic waste components (salts and metals).

Waste applications must be balanced to provide adequate plant nutrients and water while minimizing nuisance potential and percolation of waste constituents to the water table. The chemical and biological reactions that take place are interrelated and require that constituent loadings and wetting and drying cycles be optimized. As in this case, when the depth of the unsaturated (vadose) zone is less than several feet, the zone in which most of the treatment and attenuation occurs is limited.

Staff's derivation of certain Discharge Specifications and Provisions contained in this Order is discussed below.

Effluent Limitations C.1 and C.2, and Provision G.1.f

As noted above, groundwater beneath the proposed new land application sites exceeds water quality objectives for salinity. Although the fixed dissolved solids (FDS) concentration of the waste is typically less than baseline groundwater concentrations, the TDS concentration is significantly greater than that of groundwater upgradient of the sites. Because of evapoconcentration and lack of vadose zone attenuation potential to remove both volatile and fixed dissolved solids, the proposed discharge poses a significant threat of further degradation of the underlying groundwater.

The Discharger already uses steam peeling instead of caustic peeling, which has reduced the dissolved solid in the waste stream by about 79 tons per year. The *Salinity Source Reduction Plan* included in the January 2006 RWD Addendum proposed to increase return of low salinity boiler condensate to the boiler

from 68 percent to 88 percent. This would reduce salt usage for the water softener system, thereby reducing the mass of salt discharged by 12 tons per year. However, because the total mass of salt discharged each year is approximately 494 tons, this effort may not result in measurable improvements in effluent quality.

The Discharger's *Salinity Source Reduction Plan* indicates that approximately 59 percent of the total dissolved solids (55 percent of the fixed dissolved solids) in the wastewater is associated with controllable factors. Segregating the water softener brine and boiler blowdown would reduce TDS by 8 percent and FDS by 12 percent on average. However, the analysis also indicates that "product losses" account for the majority of the excess dissolved solids (both fixed and volatile), and that relatively modest reductions in this area could significantly reduce the salinity of the discharge.

The RWD did not include an analysis of the threat to groundwater quality posed by salinity constituents. Therefore, staff has made a best estimate of the flow-weighted TDS and FDS concentrations based on wastewater and irrigation supply water quality data presented in the RWD and on proposed operational practices. The objective of the analysis was to assess the overall salinity of the water used to irrigate the land applications sites and compare it to background groundwater quality. Such a comparison is of limited value because:

1. It cannot account for mobilization of salts already present in the soil prior to discharge (which is significant, as describing in Finding No. 41 of the proposed Order).
2. It cannot account for evaporation, which reduces the volume of percolate but increases the salinity concentration of that percolate.
3. It cannot account for crop uptake of FDS, which may be significant in terms of plant nutrients (such as nitrogen, potassium, and phosphorus) but insignificant in terms of other, more prevalent salinity species (such as sodium and chloride).
4. It cannot account for microbial transformation of the organic portion of TDS (VDS) within the soil.

Ideally, an analysis of the threat to groundwater would include further calculations to determine the salinity concentration of percolate that reaches the water table. However, the RWD did not provide such an analysis or sufficient information for staff to perform that analysis. Staff's best professional estimate of the flow-weighted TDS and FDS of the combined wastewater/freshwater irrigation supply is summarized in the following two tables.

TABLE 1

ESTIMATED FLOW-WEIGHTED TDS CONCENTRATION

Assumptions: 1. Normal precipitation year.
2. No salinity reduction efforts.
3. Retail line growth proportional to paste line growth.
4. Supplemental irrigation water is the same quality as process supply water.

Average TDS concentration (mg/L)

Wastewater		Data source:
Paste line	1241	RWD (Finding 17)
Retail Line	1207	RWD (Finding 17)
Fresh water	380	RWD (Finding 46)

AVERAGE DAILY FLOW [1] (mgd)	ANNUAL IRRIGATION FLOW (MG)				TDS MASS (million lb)				AVERAGE TDS CONCEN-TRATION (mg/L)
	WASTEWATER		FRESH WATER	TOTAL	WASTEWATER		FRESH WATER	TOTAL	
	PASTE	RETAIL			PASTE	RETAIL			
1.8	188	9	332	530	1.9	0.09	1.1	3.1	700
2	209	15	305	530	2.2	0.16	0.97	3.3	740
2.2	230	22	278	530	2.4	0.22	0.88	3.5	790
2.4	251	28	250	530	2.6	0.29	0.79	3.8	830
2.6	272	35	223	530	2.8	0.35	0.71	3.9	880
2.8	293	41	196	530	3.0	0.41	0.62	4.1	920
3	314	48	168	530	3.2	0.48	0.53	4.3	960
3.2	334	54	141	530	3.5	0.55	0.45	4.5	1,010
3.4	355	61	114	530	3.7	0.61	0.36	4.6	1,050
3.6	376	67	86	530	3.9	0.68	0.27	4.8	1,100
3.8	397	74	59	530	4.1	0.74	0.19	5.0	1,140
4	418	80	32	530	4.3	0.81	0.10	5.2	1,190

[1] Refers to total flow during the fresh pack season (including paste and retail lines).

TABLE 2

ESTIMATED FLOW-WEIGHTED FDS CONCENTRATION

Assumptions:
1. Normal precipitation year.
2. No salinity reduction efforts.
3. Retail line growth proportional to paste line growth.
4. Supplemental irrigation water is the same quality as process supply water.

Average FDS concentration (mg/L)

Wastewater		Data source
Paste line	514	RWD (Finding 17)
Retail Line	988	RWD (Finding 17)
Fresh water	380	RWD (Finding 46)

AVERAGE DAILY FLOW (mgd)	ANNUAL IRRIGATION FLOW (MG)				FDS MASS (lb)				AVERAGE FDS CONCEN-TRATION (mg/L)
	WASTEWATER		FRESH WATER	TOTAL	WASTEWATER		FRESH WATER	TOTAL	
	PASTE	RETAIL			PASTE	RETAIL			
1.8	188	9	332	530	0.81	0.074	1.1	1.9	440
2	209	15	305	530	0.90	0.13	0.97	2.0	450
2.2	230	22	278	530	0.96	0.18	0.88	2.0	460
2.4	251	28	250	530	1.1	0.23	0.79	2.1	480
2.6	272	35	223	530	1.2	0.29	0.71	2.2	490
2.8	293	41	196	530	1.3	0.34	0.62	2.2	500
3	314	48	168	530	1.3	0.39	0.53	2.3	510
3.2	334	54	141	530	1.4	0.45	0.45	2.3	530
3.4	355	61	114	530	1.5	0.50	0.36	2.4	540
3.6	376	67	86	530	1.6	0.55	0.27	2.4	550
3.8	397	74	59	530	1.7	0.61	0.19	2.5	560
4	418	80	32	530	1.8	0.66	0.10	2.6	580

[1] Refers to total flow during the fresh pack season (including paste and retail lines).

As indicated above, with current fresh pack season flows (which average 1.8 to 2.0 mgd) and the proposed use of supplemental irrigation water, the estimated flow-weighted total dissolved solids concentration readily achievable without further salinity or BOD reductions is approximately 700 mg/L as TDS (or 440 mg/L as FDS). If the Discharger expands the facility to the proposed monthly average flow of 4.0 mgd, the TDS of the effluent will increase to approximately 1,190 mg/L and the FDS will increase to approximately 580 mg/L unless the Discharger implements further controls to reduce salinity and/or BOD as the facility expands. Rather than limit the proposed growth of the facility by limiting effluent flows to achieve a salinity loading that is protective of groundwater quality, this Order allows the

proposed facility expansion up to the flow limits proposed in the RWD as long as the overall salinity loading does not increase beyond a protective level. Based on staff's best professional opinion, the status quo loading rate (expressed as a flow-weighted TDS concentration of 700 mg/L) should be adequate to protect groundwater quality.

Accordingly, Effluent Limitations C.1 and C.2 impose limits on the flow-weighted yearly average TDS concentrations that are consistently achievable. For the 2006 and 2007 production years, Effluent Limitation C.1 limits the flow-weighted average TDS concentration to 750 mg/L to account for error inherent in the estimate provided above. Beginning with the 2008 production year, the Discharger must meet the more stringent requirement of 700 mg/L imposed by Effluent Limitation C.2. By that time, the proposed salinity reduction measures discussed in Finding No. 59 should be in place, and that concentration should be readily achievable.

As discussed in Finding 59, the January 2006 RWD Addendum and its *Salinity Source Reduction Plan* proposed the following:

a. Increase return of low salinity boiler condensate to the boiler from 68 percent to 88 percent. This would reduce salt usage for the water softener system, thereby reducing the mass of salt discharged by 12 tons per year. However, because the total mass of salt discharged each year is approximately 494 tons, this effort may not result in measurable improvements in effluent quality.

b. Audit brine mixing, chemical usage for the clean in place systems, and product dumping practices for source reduction opportunities.

c. Regenerate the water softener system with potassium chloride. This would reduce the mass of sodium discharged. Additionally, because potassium is a crop nutrient, the net mass of dissolved solids available to leach to groundwater would be reduced. The specific reductions associated with this measure were not included in the report.

d. Evaluate the effectiveness of increasing boiler condensate return.

e. Unspecified improvements to the Paste Line to reduce loss of solids.

f. Installation of new elevators and unloading flumes to reduce product losses (which currently account for over 50% of the wastewater salinity).

g. Addition of new clean water reuse systems to recycle pump seal and cooling tower water in one of the flume systems.

Accordingly, Provision G.1.f requires that this work be completed. Depending on the outcome of implementation and the results of groundwater monitoring after the discharge begins, additional best practicable treatment or control (BPTC) measures may be needed to comply with the Effluent and Groundwater Limitations of this Order. Additional measures not proposed or discussed in the RWD might include: segregating the highly saline boiler blowdown and water softener brine for off-site disposal or on-site evaporation, and conventional treatment of the organic waste stream to oxidize BOD (and thereby reduce the volatile and total dissolved solids concentrations).

Effluent Limitation C.3 and C.5

Most of the nitrogen in food processing wastewater is present in organic form. Some of the nitrogen will remain in organic form as soil humus. Before plants can utilize the nitrogen, it must be converted (mineralized) to ammonia, and then nitrified to create nitrate. Because ammonia is volatile, some of the applied nitrogen escapes to the atmosphere in that form; under oxidizing conditions, the rest will be converted to nitrate. Ideally, all of the nitrate that is not taken up by plants is denitrified to nitrogen gas. If not, it can readily percolate in soil pore liquid to the water table.

Although several technical references provide estimated ranges of mineralization, volatilization, and denitrification rates for organic wastewaters, the ranges are generally broad and there have been no definitive studies to predict nitrogen loading rates for food processing wastewater based on site-specific soil and climate conditions. The Discharger's RWD states that, based on a wastewater carbon to nitrogen ratio of 18.7, only 67 percent of the total nitrogen loading will be plant available because of atmospheric losses and crop uptake inefficiency. However, the proposed nitrogen loading rates are not adequately supported, and it is not clear whether excess nitrate will fully denitrify in the limited thickness of vadose zone available at the sites.

The US EPA's Process Design Manual for Land Treatment of Municipal Wastewater states that typical denitrification losses can be conservatively estimated at 15 percent to 25 percent of the applied nitrogen and that volatilization losses can be conservatively considered to be insignificant in fine-grained soils. [1] Because of the predominantly fine-grained soils and shallow groundwater, Effluent Limitation C.5 allows a 20 percent reduction due to ammonia volatilization and denitrification combined, and requires that 83 percent of the total nitrogen applied be considered plant available. In order to ensure that the nitrogen content of the waste is sufficiently controlled to prevent nitrogen over application, Effluent Limitation C.3 limits the yearly flow-weighted average total nitrogen concentration to a level that has been readily achieved in past operations at the facility.

Effluent Limitation C.4

To prevent nuisance odors, the BOD loading should not exceed 100 lb/acre/day as a cycle average (*Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency, US EPA Publication No. 625/3-77-0007). Therefore, Effluent Limitation C.4.b incorporates this loading limit as a requirement. The proposed cycle average of 50 pounds per acre per day coupled with the odor prevention measures of this Order should effectively prevent such nuisance conditions.

The use of overland flow irrigation methods results in high BOD loading on the day of application. If the rate of oxygen transfer into the soil is not adequate, resulting anaerobic soil conditions can mobilize soil metals such as iron and manganese, which migrate to groundwater. The California League of Food Processors *Manual of Good Practice for Land Application of Food Processing/Rinse Water* recommends an oxygen transfer model to determine acceptable total oxygen demand (biological plus nitrogenous oxygen demand) loading rates. Although the model is detailed and supported in the literature, staff has raised questions as to its applicability for this purpose. Until this matter is resolved, there is no strong scientific basis to determine acceptable maximum daily BOD loading rates. Therefore, it is appropriate to

[1] EPA 625/1-81-013, US EPA, 1981, pp 4-4 – 4-5.

limit the peak daily BOD loading to that which is reasonably achievable given current wastewater flows and the land currently available until the Discharger provides a site-specific demonstration that justifies a higher peak daily loading.

Accordingly, Effluent Limitation C.4.a limits the BOD loading to 350 lbs/acre on any single day. Based on the cycle time and wastewater application rates provided in the RWD and a maximum BOD concentration of 1,200 mg/L, the Discharger should be able to consistently comply with this limit without further treatment or dilution unless the daily wastewater flow exceeds 2.0 mgd. On days when flows exceed this volume and/or the BOD concentration is greater than 1,200 mg/L, dilution with fresh water should be sufficient to maintain the peak daily BOD loading rate below 350 pounds per acre per day. Compliance with this requirement as flows increase to the proposed 4.0 mgd flow limit should be achievable through source reduction, installation of conventional wastewater treatment systems to reduce BOD concentrations, or a combination of the two.

Provision G.2

In order to give the Discharger an opportunity to demonstrate that higher BOD, nitrogen, and/or salinity loading limits are protective of water quality, Provision G.2 allows the Discharger to perform site-specific pilot testing pursuant to an approved *Land Application Pilot Test Workplan*. For the purpose of the pilot test only, the Executive Officer may temporarily waive one or more of the Effluent Limitations at the pilot test site.

If the Discharger successfully demonstrates that one or more of the requirements of the Order can be relaxed without causing any unreasonable threat of nuisance and or further degradation of the already impaired groundwater, this Order can be reopened to revise the requirement(s) as appropriate.

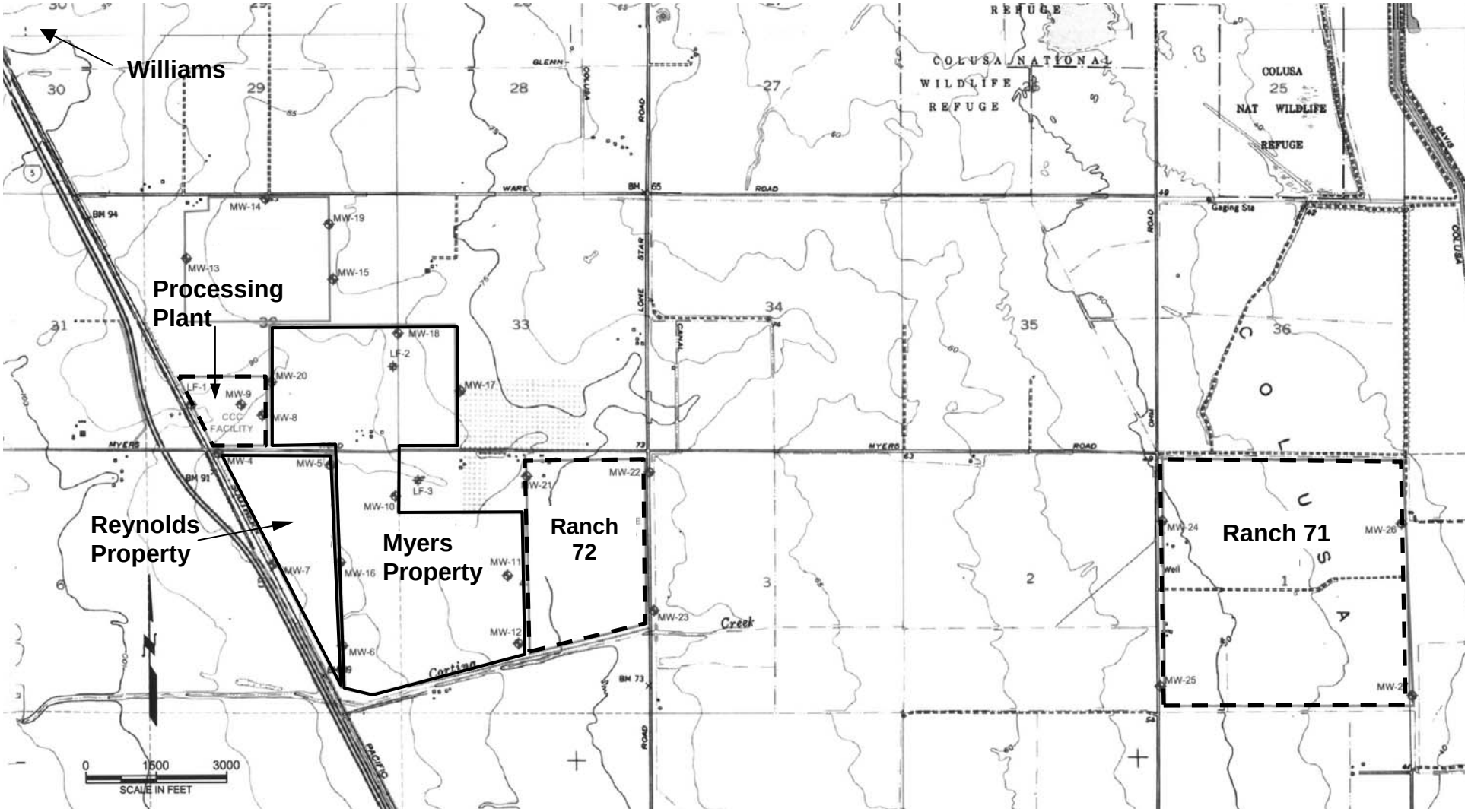
Provisions G.1.a through G.1.d and Monitoring and Reporting Program

Based on the character of the waste and site-specific conditions, the proposed discharge poses a significant threat to groundwater quality. The existing monitoring well network at the Ranch 71 and Ranch 72 sites is not adequate to determine compliance with the groundwater limitations of this Order. Both of the new discharge sites have only four wells each (two upgradient and two downgradient). Because of the size of the sites (873 acres in total) and the fact that the existing downgradient wells may be cross gradient at some times, additional monitoring wells are needed to monitor groundwater beneath the Ranch 71 and Ranch 72 land application sites. Therefore, Provisions G.1.b and G.1.d require that the Discharger construct additional groundwater monitoring wells in accordance with an approved workplan.

Because of the specific concerns regarding the completeness of waste transformation (discussed above), vadose zone monitoring is also required (Provisions G.1.a and G.1.c).

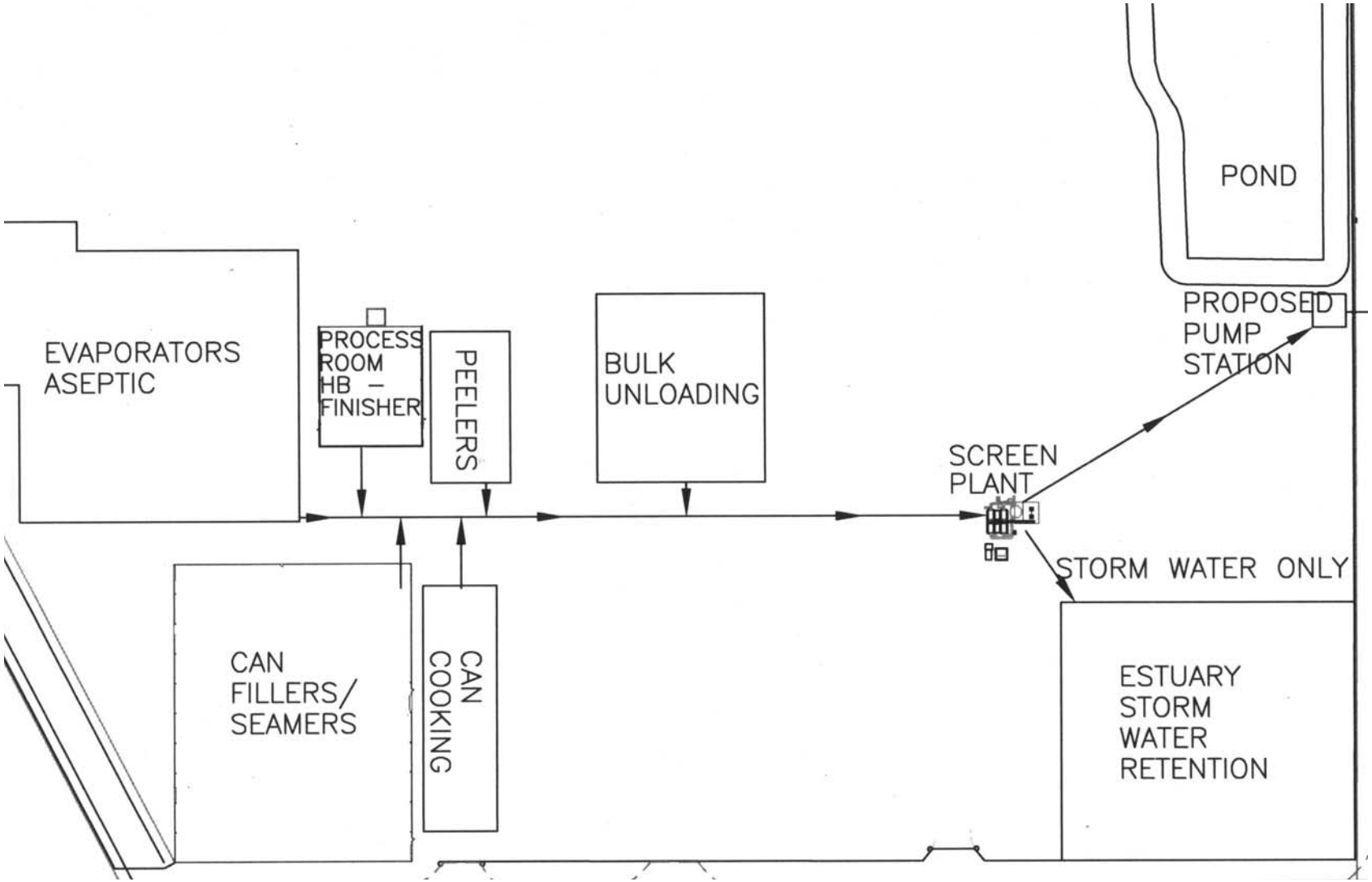
ALO:05/19/06

ATTACHMENT A



Drawing Reference: Report of Waste Discharge Figure 6-1 Brown and Caldwell January 2006	**VICINITY MAP** SK FOODS AND COLUSA COUNTY CANNING COMPANY WILLIAMS TOMATO PROCESSING FACILITY COLUSA COUNTY ORDER NO. R5-2006-0047	

ATTACHMENT B



Drawing Reference:
Report of Waste Discharge
Figure 10-1
Brown and Caldwell
January 2006

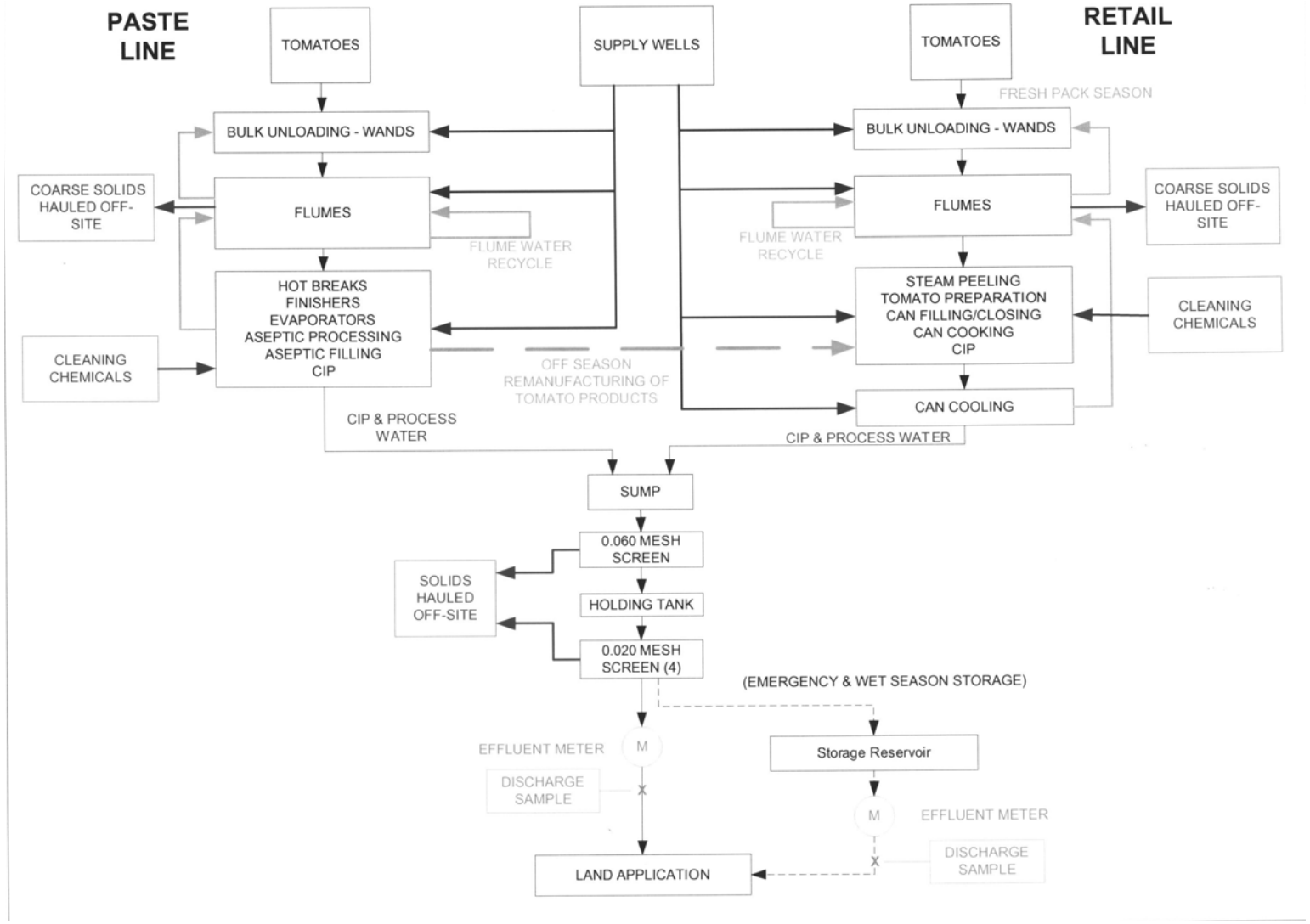
PROCESSING FACILITY PLAN
SK FOODS AND COLUSA COUNTY CANNING COMPANY
WILLIAMS TOMATO PROCESSING FACILITY
COLUSA COUNTY

ORDER NO. R5-2006-0047

N

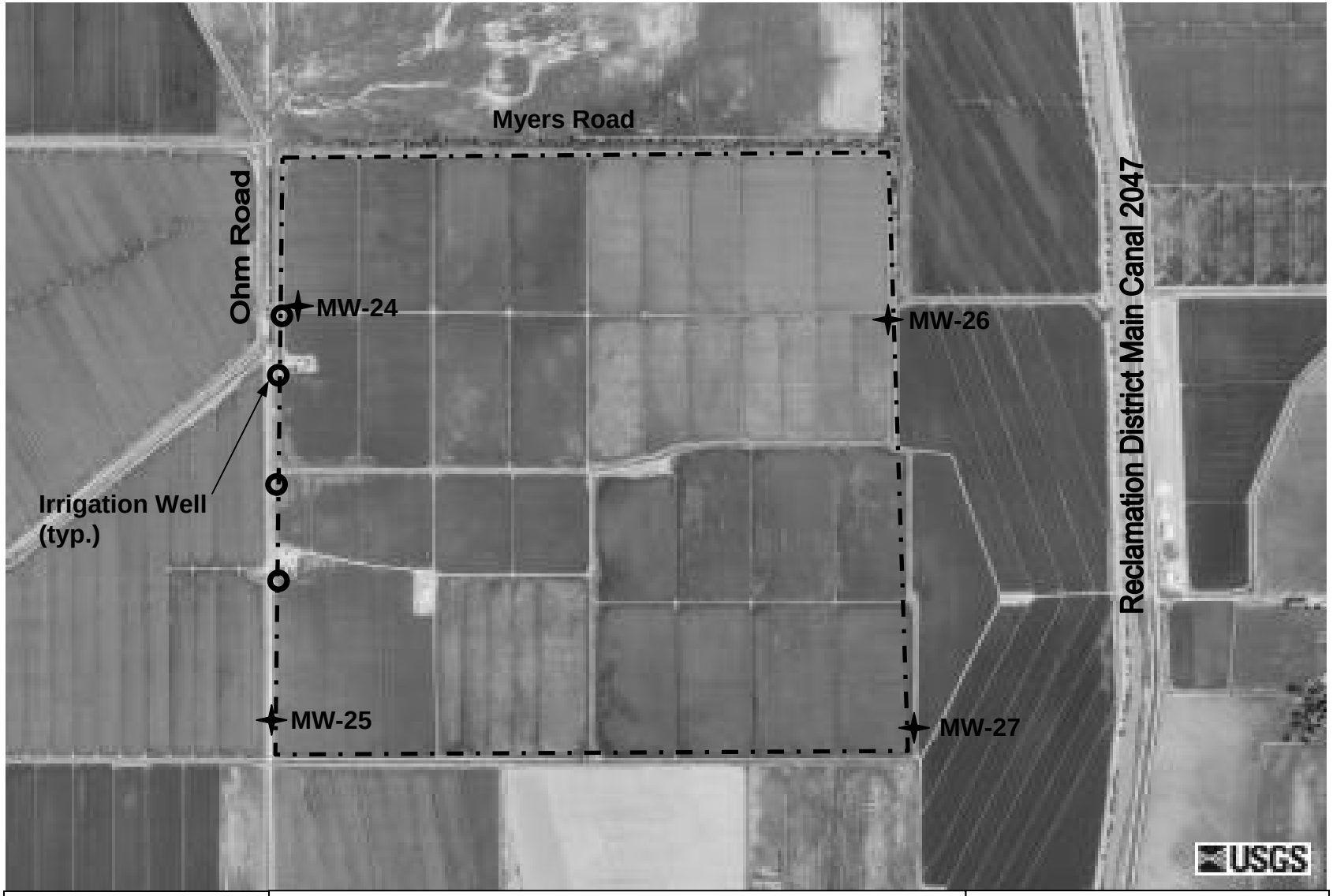
NO SCALE

ATTACHMENT C



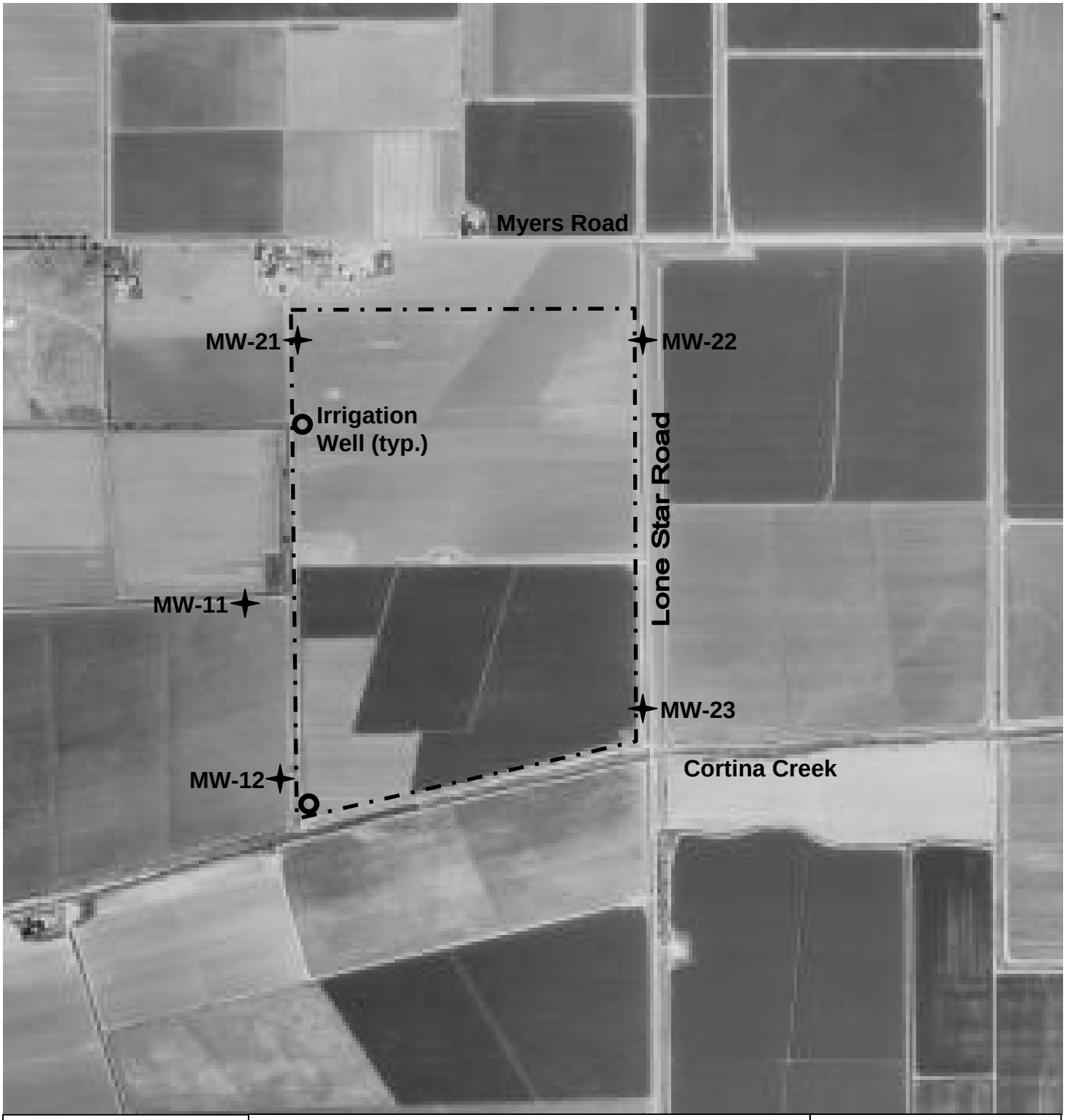
Drawing Reference: Report of Waste Discharge Figure 3-1 Brown and Caldwell September 2005	**PROCESSING FLOW DIAGRAM** SK FOODS AND COLUSA COUNTY CANNING COMPANY WILLIAMS TOMATO PROCESSING FACILITY COLUSA COUNTY ORDER NO. R5-2006-0047	

ATTACHMENT D



Drawing Reference: Report of Waste Discharge Figure 11-4 Brown and Caldwell September 2005	**RANCH 71 SITE PLAN** SK FOODS AND COLUSA COUNTY CANNING COMPANY WILLIAMS TOMATO PROCESSING FACILITY COLUSA COUNTY ORDER NO. R5-2006-0047	N Approx. Scale: 1" = 1,200 feet

ATTACHMENT E



Drawing Reference: Report of Waste Discharge Figure 11-5 Brown and Caldwell September 2005	**RANCH 72 SITE PLAN** SK FOODS AND COLUSA COUNTY CANNING CO. WILLIAMS TOMATO PROCESSING FACILITY COLUSA COUNTY ORDER NO. R5-2006-0047	**N** Approx. Scale: 1" =1,060'

ATTACHMENT F

ORDER NO. R5-2006-0047
MONITORING WELL WORKPLAN AND MONITORING WELL
INSTALLATION REPORT REQUIREMENTS
SK FOODS AND COLUSA COUNTY CANNING COMPANY
WILLIAMS TOMATO PROCESSING FACILITY
COLUSA COUNTY

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing the minimum listed information. Wells may be installed after staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a report of results, as described below. All workplans and reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California.

SECTION 1 - Monitoring Well Installation Workplan

A. General Information:
   - Purpose of well installation project
   - Copies of County Well Construction Permits (to be submitted after workplan review)
   - Monitoring well locations and rationale
   - Survey details
   - Equipment decontamination procedures
   - Health and safety plan
   - Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details:
   - Describe drilling technique
   - Sampling intervals, and logging methods

C. Monitoring Well Design:
   - Casing diameter and centralizer spacing (if needed)
   - Borehole diameter
   - Depth of surface seal
   - Well construction materials
   - Diagram of proposed well construction details
   - Type of well cap, bottom cap either screw on or secured with stainless steel screws
   - Size of perforations and rationale
   - Grain size of sand pack and rationale
   - Thickness and position of bentonite seal and sand pack
   - Depth of well, length and position of perforated interval

D. Well Development:
   - Method of development to be used
   - Method of determining when development is complete
   - Parameters to be monitored during development
   - Method of development water storage and disposal

E. Well Survey:
Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
Describe what well features will be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)
Vertical accuracy shall be to at least 0.01 foot

G. Well Sampling:
Minimum time after development before sampling (48 hours)
Well purging method and amount of purge water
Sample containers, collection method, and preservation method
Table describing sample volumes, sample containers, preservation agents, and hold times
QA/QC procedures

H. Water Level Measurement:
The elevation reference point at each monitoring well shall be within 0.01 foot. Ground surface elevation at each monitoring well shall be within 0.01 foot.
Method and time of water level measurement shall be specified.

I. Proposed time schedule for work.

SECTION 2 – Groundwater Sampling and Analysis Plan

A. General Information:
Site Location
Monitoring well locations
Monitoring well construction details including elevation, well depth, casing material and size, and screen interval
Equipment decontamination procedures
Health and safety plan
Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Water Level Measurement:
Ground surface elevation at each monitoring well shall be within 0.01 foot.
Method and time of water level measurement shall be specified
Water level in well shall be allowed to equilibrate prior to measuring the depth to water

C. Well Sampling:
Well purging method and amount of purge water, purge water storage
Sample containers, collection method, and preservation method
Table describing sample volumes, sample containers, preservation agents, and hold times
Identification of analytical laboratory
Chain of custody procedures
QA/QC procedures

D. Proposed time schedule for work.

SECTION 3 - Monitoring Well Installation Report

A. Well Construction:

Number and depth of wells drilled
Date(s) wells drilled and completed
Description of drilling and construction
Scaled map of facility site features including monitoring wells, buildings, storage ponds, waste piles, etc.
A well construction diagram for each well must be included in the report, and must contain the following details:

Drilling Contractor and driller name
Depth of open hole (same as total depth drilled if no caving occurs)
Method and materials of grouting excess borehole
Footage of hole collapsed
Length of slotted casing installed
Depth of bottom of casing
Depth to top of sand pack
Thickness of sand pack
Depth to top of bentonite seal
Thickness of bentonite seal
Thickness of concrete grout
Boring diameter
Casing diameter
Casing material
Size of perforations
Well elevation at top of casing
Stabilized depth to groundwater
Date of water level measurement
Monitoring well number
Date drilled
Location

B. Well Development:

Date(s) of development of each well
Method of development
Volume of water purged from well
How well development completion was determined
Method of effluent disposal
Field notes from well development should be included in report.

C. Well Survey:

Identify the coordinate system or reference points
Survey the well casing with the cap removed (horizontal and vertical coordinates)
Registered Engineer or Licensed Surveyor's report and field notes in appendix
Describe the measuring points (i.e. ground surface, top of casing, etc.)
Tabular survey data