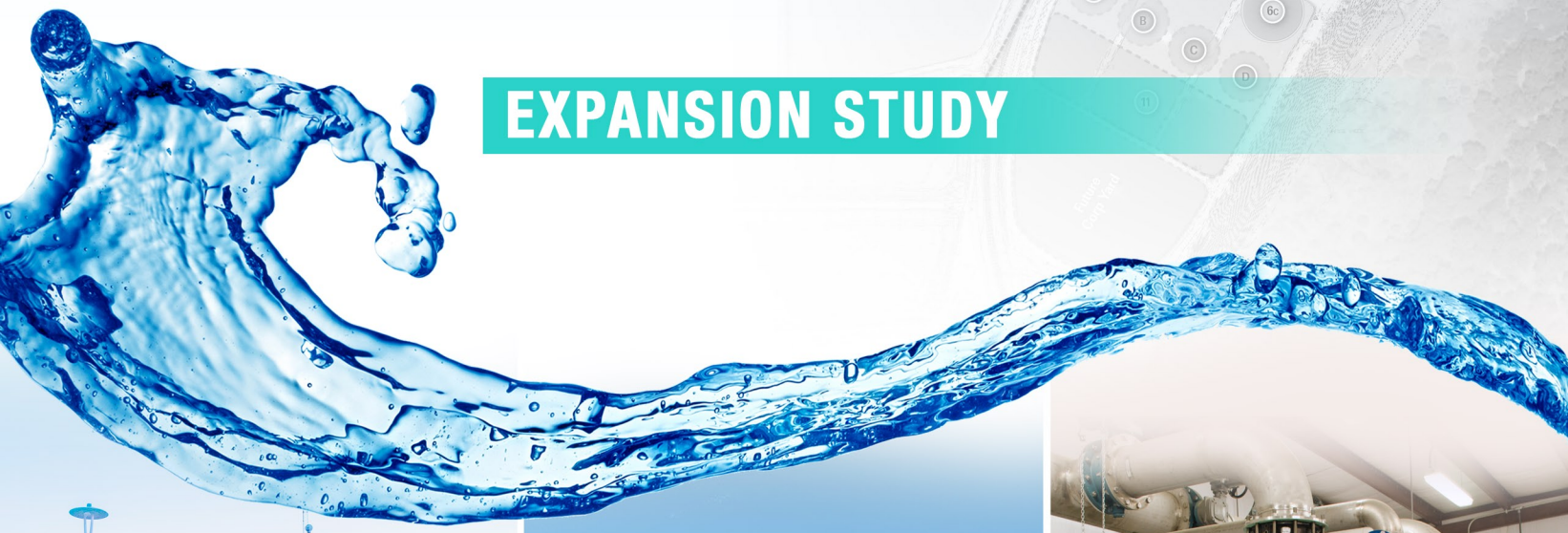
PRELIMINARY WWTP MASTER PLAN V3.0

EXPANSION STUDY



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Background and Purpose

The Escalon Wastewater Treatment Plant (WWTP) is owned and operated by the City of Escalon, and is located at 25100, East River Rd, Escalon, CA 95320. This treatment facility uses excavated, unlined, and earthen basins for secondary oxidation and secondary clarification, the secondary oxidation systems are commonly referred to as aerated lagoons. There is no primary treatment or tertiary treatment. Individual influents of domestic (non-industrial) and industrial (tomato and pepper processing water) are generated in Escalon, received at the WWTP, treated separately in different portions of the facility, and recharged separately in different portions of percolation basins into the shallow groundwater. Currently the Escalon WWTP treats median flows of 0.5 MGD of domestic wastewater and 1.8 MGD of industrial wastewater (July – November), and maximum month flows of 0.5 MGD of domestic wastewater and 2.1 MGD of industrial. This master plan evaluates the facility, identifies problems and deficiencies, and provides potential options for improving and expanding the treatment and percolation systems. In 2014 there was a Cease and Desist Order (CDO) for the facility including excessive odor, high BOD loading in the percolation basins, and high percolation basins' level.

Figure 1 – Aerial Google Image of the Escalon WWTP: +/-28-acres of Treatment Basins 1-9 (right), +/-15-acres of Domestic Percolation Basins (four large square basins in upper left), and +/-23-acres of Industrial Percolation Basins (remaining 8 basins in lower left)

The existing year 2000 Water Board permit is still applicable. The permit describes details of wastewater generation including 1999 influent data, which presents domestic wastewater influent flow of 0.7 MGD, higher than 2019, but likely more dilute in 1999 compared to 2019 due to the implementation of low-flow fixtures in 2019. Thus 1999 influent loading was likely compared to the loading received to the WWTP in 2019. Industrial wastewater discharges in 1999 were 3 MGD in September and October, exceeding the discharge monthly generation in 2019. It is also believed the 2019 industrial wastewater is stronger / higher COD concentration compared to 1999, thus the loading from 1999 and 2019 are likely comparable. The year 2000 permit limits industrial discharge to 2.0 MGD dry weather and 3.0 MGD flow.

1 Information Obtained and Used in this Master Plan

1. Project As-Builts 1992, 1996, 2000
2. City of Escalon Operating Budgets
3. June 21, 2000 Regional Board WDR Permit Requirements
4. 2015 Blackwater Consulting Report
5. Excel Workbook Water Quality Data
6. November 1, 2018 Site Visit and Interview
7. March 4, 2019 Site Visit and Interview
8. March 25, 2019 Site Visit and Interview including Industry
9. July 3, 2019 Site Visit and Interview
10. July 12 – September 5, 2019 Correspondence with Sacramento Regional Board
11. July 23, 2019 Site Visit including Industry, Sampling, and Analysis
12. July 24, 2019 Sampling, and Analysis
13. July 25, 2019 Installation of Percolation Basins Monitoring Level Equipment
14. July 30, 2019 Site Visit including Industry and Interview
15. August 5, 2019 Correspondence with SSJID Confirming Non-Potable Demand
16. September 5, 2019 Site Visit and Interview including Industry
17. Proposal for Nexum Microscreen Deployment
18. BioWin Secondary Process Modeling

Table 1 – Existing Facility Basis of Design Summary including Summary of Existing Data

		Units	Domestic					Industrial				
Primary Process												
Inflow Median DF		MGD	0.483					1.805				
Inflow MMADF		MGD	0.503					2.069				
PDF		MGD	0.759					3.588				
PHF		GPH	Flow Data Provided in Days					Flow Data Provided in Days				
			Source: City of Escalon Waste Water Treatment Facility Annual Report 2018									
Median BOD	Conc.	mg/L	205					2000				
	Load	lbs./day	1297.49					41840.23				
MMBOD	Conc.	mg/L	460					2500				
	Load	lbs./day	1928.47					43148.74				
PDBOD	Conc.	mg/L	BOD Only Measured Once a Month					BOD Only Measured Once a Month				
	Load	lbs./day										
			Source: City of Escalon Waste Water Treatment Facility Annual Report 2018 (July/August)									
Median TSS	Conc.	mg/L	400*					340				
	Load	lbs./day	1610.91					10003.03				
MMTSS	Conc.	mg/L	800*					663				
	Load	lbs./day	3353.86					11445.22				
PDTSS	Conc.	mg/L	TSS Only Measured Once a Month					TSS Only Measured Once a Month				
	Load	lbs./day										
			Source: City of Escalon Waste Water Treatment Facility Annual Report 2018									
Median N	Conc.	mg/L	40*					11.5				
	Load	lbs./day	161.09					173.10				
MMN	Conc.	mg/L	60*					310				
	Load	lbs./day	251.54					5350.44				
PDN	Conc.	mg/L	Nitrogen Only Measured Once a Month					Nitrogen Only Measured Once a Month				
	Load	lbs./day										
Secondary Process												
Volume		MG	22.00					17.10				
HRT		days	43.77					8.26				
SRT		days	N/A					N/A				
Air Flow		lb. O_2/hp-hr	13.80					No Air Flow Data Available				
Median DO Concentration		mg/L	3.96 **					4.43 **				
Median O_2 Mass Demand		lb. O_2/day	240					8069				
MM O_2 Mass Demand		lb. O_2/day	2120					16885				
			Pond 5	Pond 6	Pond 7	Pond 8	Pond 9	Pond 1	Pond 2	Pond 3	Pond 4	
HP		30	30	15	15	30		50 to 90	390	410	60	
HP Total			90					950				
Settling Pond												
Area		AC	20.60 ***					8.60 ***				
Surface Loading @ MMADF		gpd/ft^2	0.560					5.524				
Secondary Solids Generated (Theoretical)		lbs.	1543					34519				
Secondary Solids Disposed		lbs.	No Solids Disposed Data Available					No Solids Disposed Data Available				
Percolation Basin												
Area		AC	15.30 ***					22.60 ***				
Surface Loading @ MMADF		in/day	1.210					3.372				

* Estimated Value

** Median DO Concentration is a combination of all the pods in each category. Ponds have varying levels of dissolved oxygen which is not reflected in the value shown

*** Area and the resulting surface loading is a combination of the ponds in each category.

Sources

City of Escalon Waste Water Treatment Facility Annual Report 2018

West Yost Associates Consulting Engineers Technical Memorandum 2014

Blackwater Consulting Engineers, Inc. Food Processing Waste Loading Technical Report for the City of Escalon 2015

2 Identified Problems with Escalon WWTP

Problem A: No place to put treated water, percolation basins too small

Problem B: Facility basin boundaries are leaking and wastewater not contained

Problem C: Insufficient processes and technology to treat water and solids

Problems D: Premier industrial wastewater contains substantially higher solids and dissolved carbon than reported or City facility can handle

Problem A - No Place to Put Treated Water (Percolation Basins Too Small)

In discussions with City Staff and Operations Personnel, the percolation basins' applied water periodically backs-up (does not infiltrate sufficiently) during specific conditions potentially caused by one or more of the following:

1.) Deep soil clogging or reduction in permeability from hydraulic compression, biological growth, organic fouling, or inorganic clay swelling.

2.) Hydraulic mounding and back-pressure from other percolation activity and river backwater.

3.) Shallow surface layer clogging from algae, inorganic silt, or organic debris/biological sludge.

Despite repeated percolation basin maintenance activities including shallow scarifying and deep ripping when specific basins can be dried, which is primary challenge to the percolation system, in 2014 the level in the percolation basins exceeded allowed depths per the permit. A restriction to operation is the domestic and industrial basins are separated in the Regional Board permit, restricting transfer of water from various clogged basins to unclogged basins.

Dividing the domestic effluent flow (0.5 MGD) by the domestic percolation area (15.3 acres or 666,000 square feet) results in a required percolation rate of 1.2" per day, assuming all of the available percolation area is online. With one of the four basins offline at a time to provide maintenance, part of routine maintenance, the required percolation rate is 1.6" per day. Additional influent domestic flow will require a faster percolation rate than described. After a few weeks, clogging is typical with non-clarified secondary effluent discharge containing +/- 50 ppm of TSS. 0.5 MGD at 50 ppm TSS results in 4 ft2 of dry solids applied to the basins' floor per day, plus additional solids from algae and silt, which can cause a thin layer of plugging. After clogging, the available percolation rate may decrease to less than what is available. There appears to also be groundwater mounding of the domestic percolation basin perched vadose zone, caused by high water level in the river and more importantly industrial percolation. Additional domestic percolation area is required to allow drying and ripping for maintenance.

Photograph 1 - November, 2018 1 of 4 Domestic Percolation Basins. These Basins are Overloaded Hydraulically, and are Unable to be Emptied for Needed Maintenance to Restore Percolation Capacity. Sharing Industrial and Domestic Percolation Basins Would Enable Domestic Basin Cleaning.

Dividing the dry season industrial effluent flow (2.1 MGD) by the industrial percolation area (22.6 acres or 980,000 ft2) results in a required percolation rate of 3.4" per day, assuming all of the available percolation area is online. With one of the eight basins offline at a time to provide maintenance, part of routine maintenance, the required percolation rate exceeds 4" per day. Additional influent industrial flow will require a faster percolation rate than described. After a few weeks, clogging is typical with non-clarified secondary effluent discharge containing +/- 400 ppm of TSS. 2.1 MGD at 400 ppm TSS results in 130 ft2 of dry solids applied to the basins' floor per day, plus additional solids from algae and silt, which can cause a thin layer of plugging. After clogging, the available percolation rate may decrease to less than what is available. There may also be restrictions in percolation from groundwater mounding caused by high water level in the river. Additional industrial percolation area is required to allow drying and ripping for maintenance.

Figure 2 - July 2019 Groundwater Level Equipment Installation Characteristics

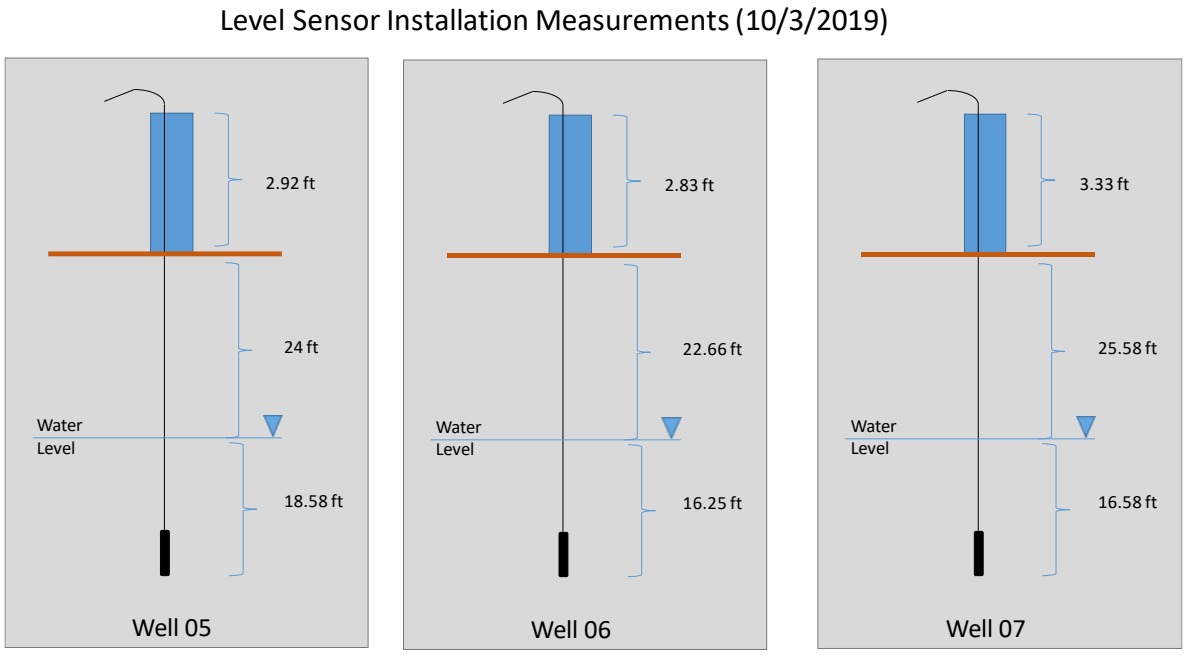
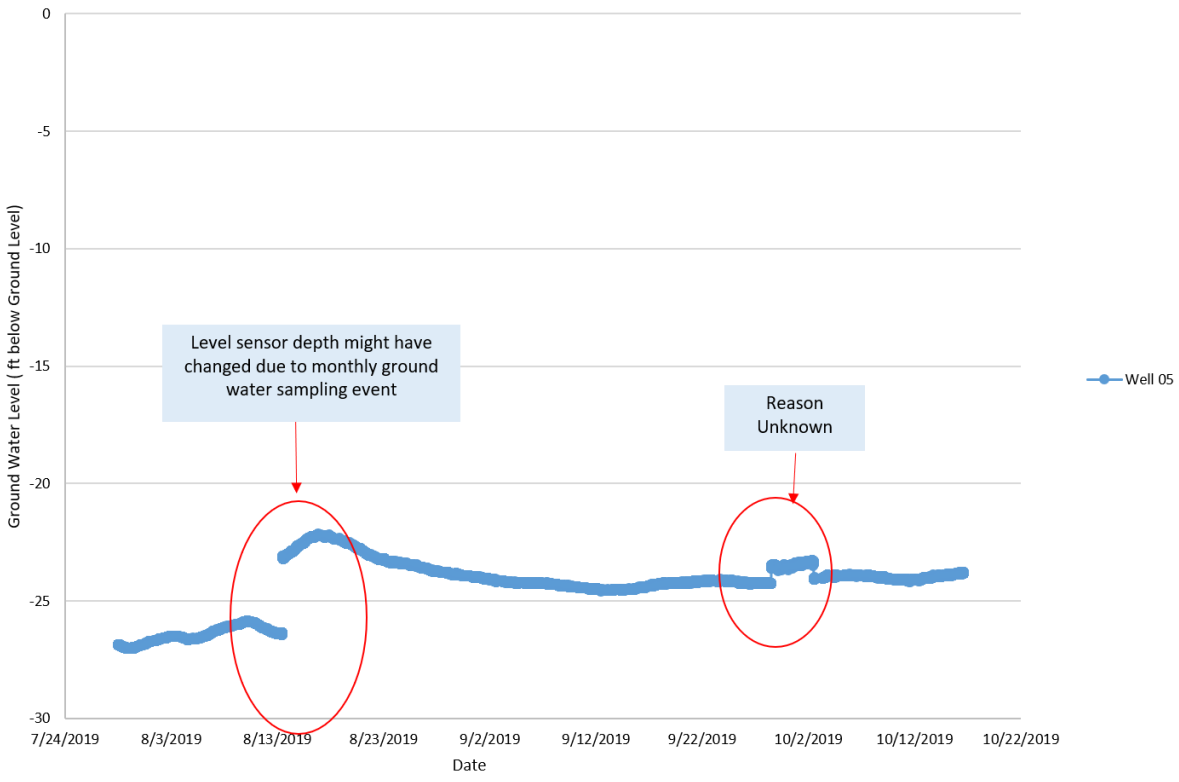


Figure 3 - 2019 Well 5 Data Shows Relatively Consistent Groundwater Level with Maximum Level in the Summer, Indicates Groundwater Mounding is Not Causing Restriction in Percolation (NOTE: On 8/13/19 the Stanislaus River level decreased, which is counter to the data observed)



Problem B - Facility Basin Boundaries are Leaking and Wastewater Not Contained

In August 2019 Pond 4, one of the two industrial secondary clarification basins, seeped secondary water to outside of the basin, offsite of the WWTP, and to the adjacent property. Reportedly other similar facility and percolation embankment seepage have occurred. None of the facility basins are lined, and especially after routine basin cleaning, the embankments have leaked through the basins' side walls three times in the past four years, due to rodents burrowing and because the basins are elevated compared to existing adjacent property. Treatment basins and the edges of the percolation basins shall be lined to reduce soil erosion, limit rodent burrowing, and prevent seepage through the side walls of any earthen basins off property.

Photograph 2 - August 2, 2019 Side Wall Seepage of Industrial Treatment Basin 4 to Offsite Property Due to Unlined Earthen Basins Situated High Above Adjacent Property

Photograph 3 - August 2, 2019 Seepage Water Pumping Back into Basin 4, Photo Shows High Elevation Difference from Treatment Facility to Offsite Property, which Accelerates Seepage

Photograph 4 - Example of Percolation Basins in Lathrop, CA with Side Wall Liner System, Modern Percolation Basins are Shallow for Frequent Cleaning and Restoration of Capacity

Problem C - Insufficient Processes and Technology to Treat Water and Solids

NO SCREENING

Industry standard wastewater treatment facilities include primary, secondary, and tertiary treatment systems. At the Escalon WWTP first there is no primary treatment: no headworks, no coarse or fine screening, no grit removal, no micro-screening, and no upstream solids removal for offsite hauling and disposal. Solids including debris, personal care products, toilet materials, and food are currently manually removed from treatment basins, when possible, by using waders and rakes/shovels. Basin equipment often gets clogged by this primary debris. Reportedly weekly equipment is clogged by debris.

NO UPSTREAM TSS REMOVAL

Industrial influent contains high quantities of large-size food debris solids which can be recovered prior to entering the treatment basins. By not removing the material as it leaves the industrial processing facility, or at the Escalon WWTP prior to discharge into the first biological treatment basins, the solids end up in the four upstream treatment basins 1, 2, 3, and 4. Considering the load of influent TSS is comparable to the biological activated sludge volume, at the end of the dry season the quantity of solids requiring removal essentially doubles. Also, the TSS from the influent becomes biological oxygen demand, requiring substantial additional oxygen for treatment. Agitation from wind and wave action has been shown to cause basin side wall erosion, which adds to the solids required for removal. Currently up to four feet deep of solids including influent TSS and WAS are removed prior to the next dry season by construction equipment. The solids sit in the bottom of the basins throughout the wet season and emit odors.

Photograph 5 - July 3, 2019 Dried Sludge Removal from Industrial Clarifier Basins. This Sludge Material, Containing Activated Sludge (Biology for Treatment) and Influent Tomato Solids, Remains in the Basin for Over Six Months Before it is Removed. Removal Costs on the Order of $300,000 per Occurrence.

LOW EFFICIENCY OXYGEN DELIVERY

The current secondary treatment for both domestic and industrial consists of dozens of low-efficiency surface aerators with supplemental liquid oxygen injection on the industrial aerators. The efficiency of mixing and delivering oxygen to the activated sludge can be improved up to 3-fold by replacing this existing equipment with modern diffused air and dissolved oxygen equipment. The currently nearly $500,000 per year costs of electricity and oxygen can be reduced by at least half by upgrading as described. Downstream of the secondary oxidation basins on both domestic and industrial treatment trains consist of unsophisticated basins for settling of secondary activated sludge. No sludge removal systems are present at the bottom of the settling basins. To enhance removal of secondary solids, and to improve the removal of secondary solids without manual dewatering and construction equipment removals, modern clarifiers can be provided.

Photograph 6 - July 23, 2019 View of Industrial Treatment Surface Aerators Supplemented with Liquid Oxygen. Surface Aeration with Oxygen Supplementation is Inefficient. Dissolved Aeration May Reduce Annual Electricity and Oxygen Costs from $500,000 by 2-3X of that Cost with Improvements including Upstream TSS Removal.

POOR SECONDARY SOLIDS REMOVAL

To improve the long-term operation of the percolation basins, including slowing the rate of clogging, the secondary water shall be better oxidized to remove dissolved organics, and also removed of a majority of the suspended solids. The secondary enhancements described will improve the oxidation of organics and nutrient removal. To better removal suspended solids, and prepare for other uses of the effluent including discharge to the SSJID non-potable canal, tertiary filtration may be required. Cloth disk filtration may be implemented to cost-effectively and simply remove remaining secondary solids, which can be followed by chlorine disinfection if required.

Problem D - Premier Industrial Wastewater Contains Substantially Higher Solids and Dissolved Carbon than Reported or City Facility can Handle

In the summer and fall, Premier discharges contain nearly 90% of the total load of organics and suspended solids at the City of Escalon facility, including domestic loading. In 2018 and 2019 reportedly organic farming was initiated earlier, and during this period the dissolved organic load from Premier increased by 50% to nearly 3000 ppm COD. The existing data and lab information provided by Premier appears to substantially underestimate the suspended solids loading, likely because the particle size of the discharge from Premier is larger than the sampling system tubing used by Premier, and solids Premier may only be measuring small solids and missing the large solids load from larger solids. During a site visit on 7/29/19, there are large quantities of large solids, each solid about 1-2 inches in length, although the Premier data shows TSS < 300 ppm which seems unreasonable. During a 7/23/19 visit it was confirmed that the TSS exiting Premier is on the order of 2000+ ppm, almost an order of magnitude higher than reported. The colander photographs of collected solids further demonstrates the visual appearance of wet solids content by volume is over 5% of wet solids by volume. During the September 5, 2019 site visit, it was also confirmed extremely high TSS was exiting the DAF unit at Premier.

The pre-treatment systems at Premier consist of fine screening and dissolved air floatation (DAF). The DAF system at Premier is overwhelmed with solids and is not functioning to remove solids appropriately. During the 7/29/19 site visit, hundreds of solids of 1-2 inches in length pour over each outlet weir of the DAF every second. This was also witnessed on 9/5/19. The character of the solids appeared to be more inorganic on 9/5/19 than 7/29/19. Reportedly when the DAF system goes down for maintenance, no pre-treatment is provided on the discharge to the City, which could contain unacceptable levels of organics and solids. At a minimum a second DAF system will be needed at Premier to provide redundancy and improve the discharge of solids from Premier, and potentially a micro-screen downstream of the DAF(s) could provide additional insurance for removal of TSS prior to discharge to Escalon's WWTP. During a site visit on 10/3/19, the DAF unit at Premier was offline for maintenance, and untreated industrial discharge was sent to the Escalon WWTP.

During sampling and analysis on July 23 and July 24, 2019, influent and effluent samples were taken from both domestic and industrial treatment basins to evaluate treatment efficiency in each treatment units. Sampling locations were identified and samples were taken in morning (8:00 am), afternoon (2:30 pm) and evening (4:30 pm) for industrial discharge to evaluate variability on water quality during day time operations. In addition, water quality samples were taken from the Premier Brands (tomato) plant and Eckert Cold Storage (pepper) plant discharge for industrial source water characterization. Moreover, a sample from non-portable irrigation canal was analyzed to evaluate expected treated water quality for irrigation discharge as a future plant expansion option.

Sampling locations can be described as follows;

1. Sample 1 – Premier Brands (tomato) plant
2. Sample 2 – Eckert Cold Storage (pepper) plant
3. Sample 3 – Industrial Influent (Influent distribution Box)
4. Sample 4 – Industrial effluent (Pond 1 outlet structure)
5. Sample 5 – Domestic Influent (Influent discharge pipe)
6. Sample 6 – Domestic effluent (Pond 7 effluent discharge pipe)
7. Sample 7 – Irrigation Canal

Table 2 summarizes the water quality parameters, equipment and specific test methods used for evaluation during the investigation. Each sample was filtered with 0.45 micron filters and filtrate was used for water quality testing to reduce interference of suspended matter on colorimetric test results.

Table 2 – Water quality parameters, equipment and specific test methods used.

Class	Parameter	Method	Equipment	Major Significance
General	pH	Handheld probe	OAKTON PCTS 50	Sensitive for biological growth
	DO	Handheld probe	HACH HQ-40D	Sensitive for biological activity
	Alkalinity	HACH 8203	HACH DR 2800	Sensitive for nitrification/ denitrification
Nutrients	NH_3-N	HACH 10031	HACH DR 2800	Nutrients of concern
	NO_2-N	HACH 8153	HACH DR 2800	
	NO_3-N	HACH 10206	HACH DR 2800	
	PO_4^{3-}	HACH 8048	HACH DR 2800	
Organics	COD	HACH 8000	HACH DR 2800	Inorganic/ Organic oxygen demand

Table 3 and Table 4 summarized the water quality evaluation results in individual sampling locations for samples taken on July 23 and July 24,2019 respectively.

Table 3 - Water quality analysis results (Samples of 07/23/2019)

Sample No	Description	pH	DO (mg/L)	ORP (mV)	Temp (^oC)	NH3-N (mg/L)	NO2 (mg/L)	NO3-N (mg/L)	PO_4^{3-} (mg/L)	COD (mg/L)	Alkalinity (mg/L as CaCO3)
1	Premier Tomato Plant	4.60	0.16	61	31.3	10.8	13	1.40	30.8	2440	290
2	Eckert chili Plant	6.92	7.91	97	30.9	4.7	11	3.16	3.1	1040	50
3	Industrial Influent	5.86	1.01	119	30.5	15	3	3.99	23.00	2155	60
4	Industrial Effluent	7.77	1.26	-8	31.1	0	2	0.57	4.5	92	330
5	Domestic Influent	8.11	0.51	-211	28.2	31.8	2	0.33	8.9	116	300
6	Domestic Effluent	8.19	9.51	31	27.6	0	1	10.20	16.9	19	170
9	Irrigation Canal	6.84	9.96	41	21.8	0	1	0.23	0.20	ND	60

Table 4 - Water quality analysis results (Samples of 10/3/2019)

Sample No	Description	pH	DO mg/L	ORP mV	Temp °C	NH3-N mg/L	NO2 mg/L	NO3-N mg/L	PO_4^{3-} mg/L	COD mg/L	Alkalinity mg/L as CaCO3
1	Premier Tomato Plant									1614	
2	Eckert Pepper Plant										
3	Industrial Influent	4.85	0.38	23	24.7	11	1	0.436	6.60	1222	130
4	Industrial Effluent	7.81	7.42	37	18.8	16.9	1	0.261	2.1	249	420
5	Domestic Influent	7.46	1.03	-133	26.7	37.5	1	0.295	10.9	276	270

Below are the conclusions attained from the water quality analysis,

1. Premier (Heinz) Tomato plant is not complying discharge standards for pH which effects treatment plant influent pH: pH of industrial influent in morning is low compared to afternoon and ranged between pH of 4.3 -5.8 (acidic). Generally, there is buffer in the large secondary basins with adequate pH, and hourly fluctuations in pH may not be detrimental to the secondary treatment process.

2. When considering the water quality of influent and effluent of industrial treatment train, evidence of about 95% COD reduction was observed based on sampling in July and October, 2019. Approximately 5% COD remaining resulted in 92-182 mg/L of COD entering the percolation basins, and the permit limit for BOD is 150 mg/L, indicating the percolation basins are having to provide treatment. The BOD/COD ratio has not been confirmed, it is anticipated to be on the order of 0.8 for the industrial system. It is noted that industrial clarifier pond 4 was offline for bank repair for part of the summer and fall of 2019, which may have decreased treatment.

3. Due to the high COD in the industrial flows, the industrial treatment process is likely nutrient limited, such that nitrogen and phosphorus are all consumed by the activated sludge, and additional nutrient may improve the process, such as the case with a combined domestic and industrial system.

4. The filtered versus non-filtered samples for industrial COD averaged 94% for influent wastewater.

5. ***High levels of suspended solids were observed especially in Premier Brand's plant samples which effects the influent water quality of the treatment plant.*** Figure 4 shows the suspended solid (TSS) content of individual samples taken at the industrial sources and influent water quality at the treatment plant. This shows substantial improvement is TSS removal is important for all considered alternatives.

Premier Plant Sample | Eckert Plant Sample | Treatment Plant Sample

Figure 4 – Suspended solids loading from industrial discharges and treatment plant Influent

Below is an additional conclusion attained from the water quality analysis on the domestic treatment systems:

6. Evidence of complete nitrification was observed in domestic wastewater treatment train with COD a reduction of more than 80% in July. Also in July, denitrification was not occurring in the domestic treatment train where nitrate-N concentrations of 10 mg/L were observed in effluent water. The drinking water standard of 10 mg/L nitrate-N will need to be considered for future domestic effluent percolation basin operation.

Figure 5 – Filtered COD Variation from 7/23/19 and 10/3/19.

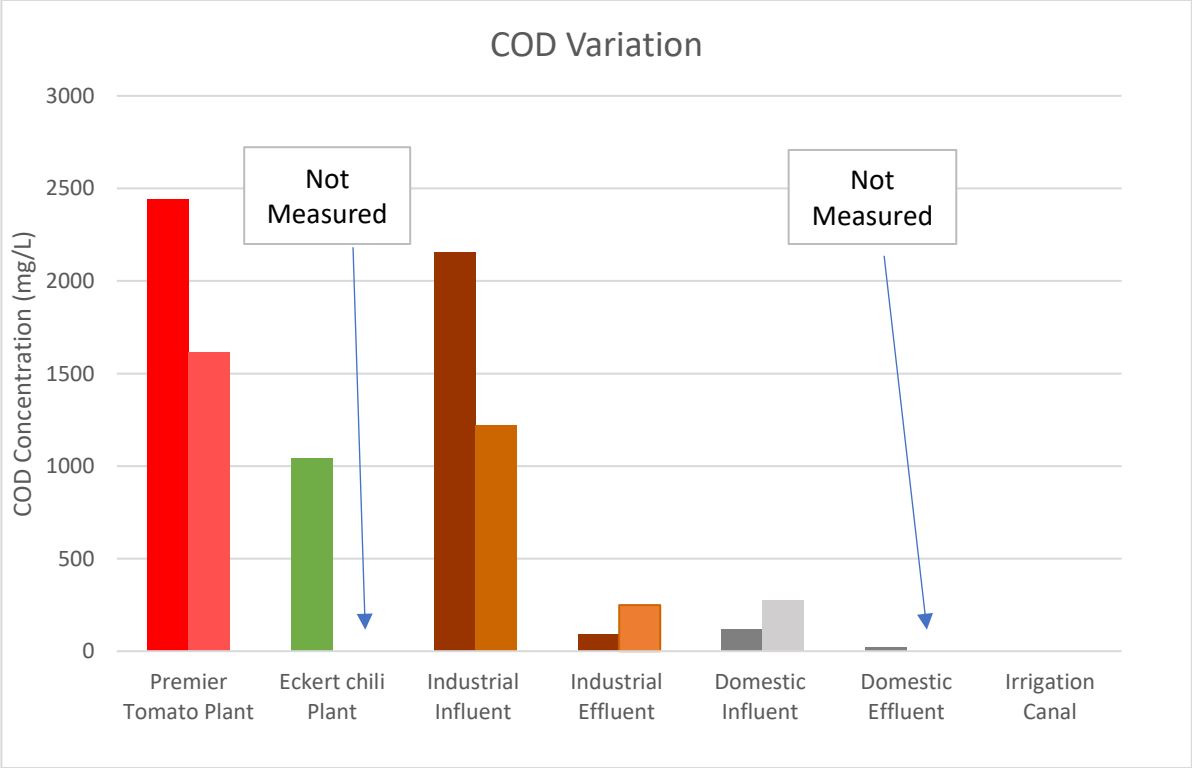


Figure 6 – pH Variation from 7/23/19 and 10/3/19.

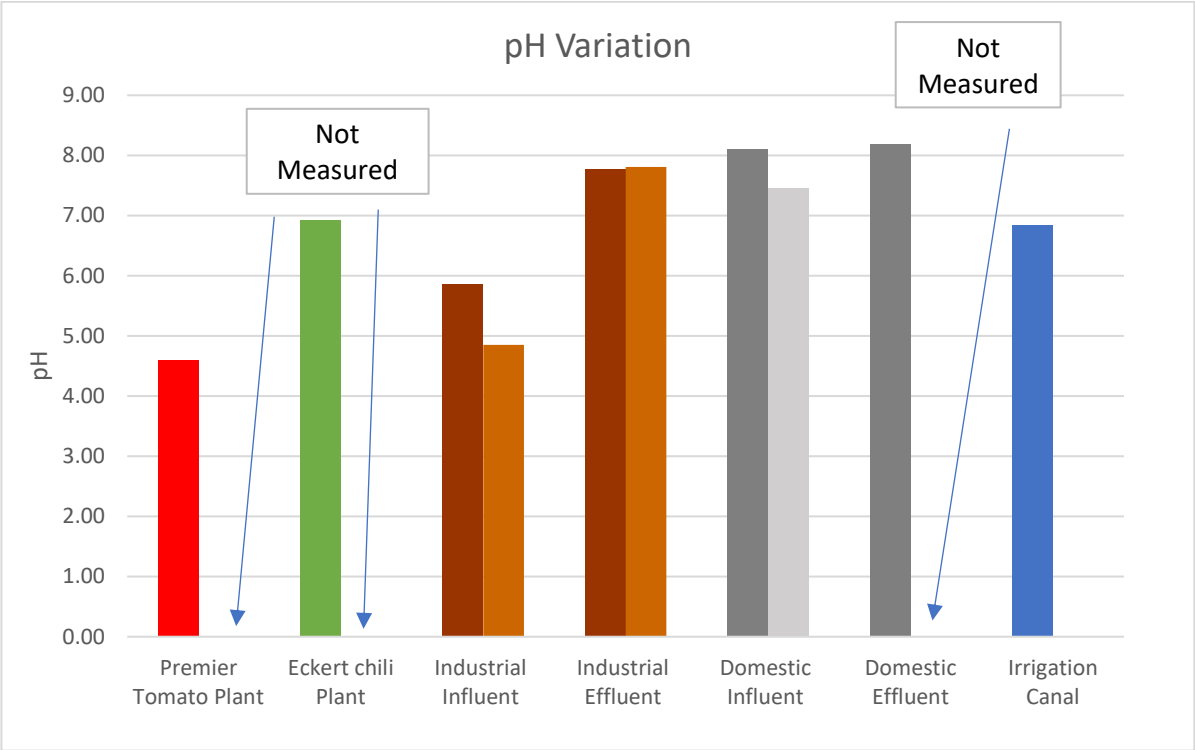


Figure 7 – Filtered NH3-N Variation from 7/23/19 and 10/3/19.

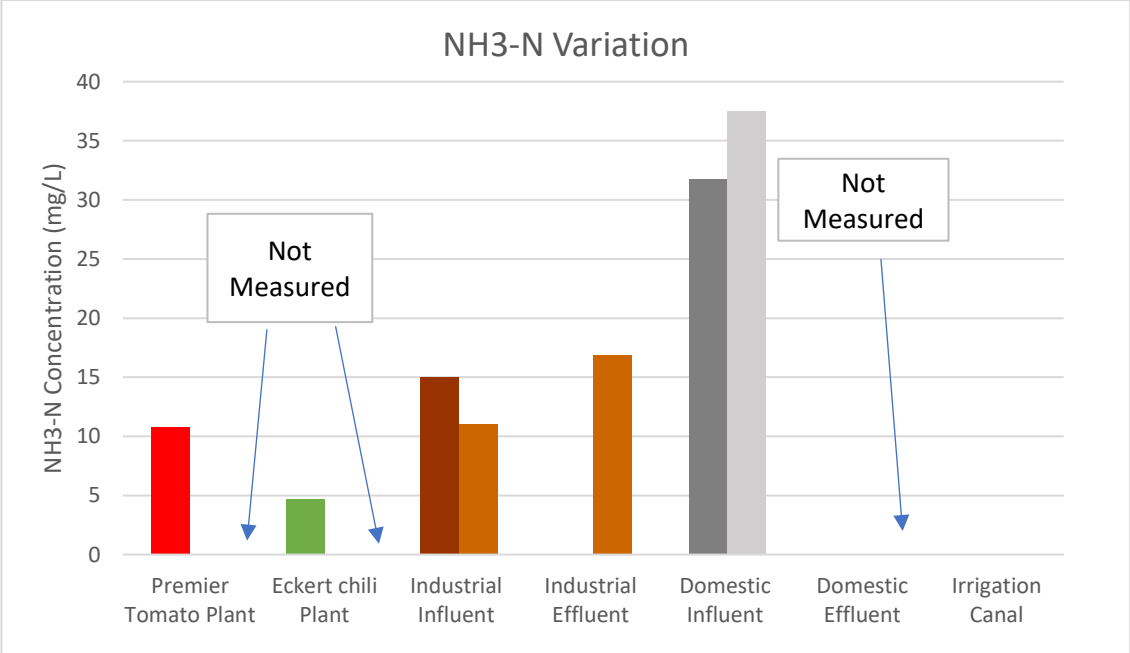


Figure 8 – Filtered NO3-N Variation from 7/23/19 and 10/3/19.

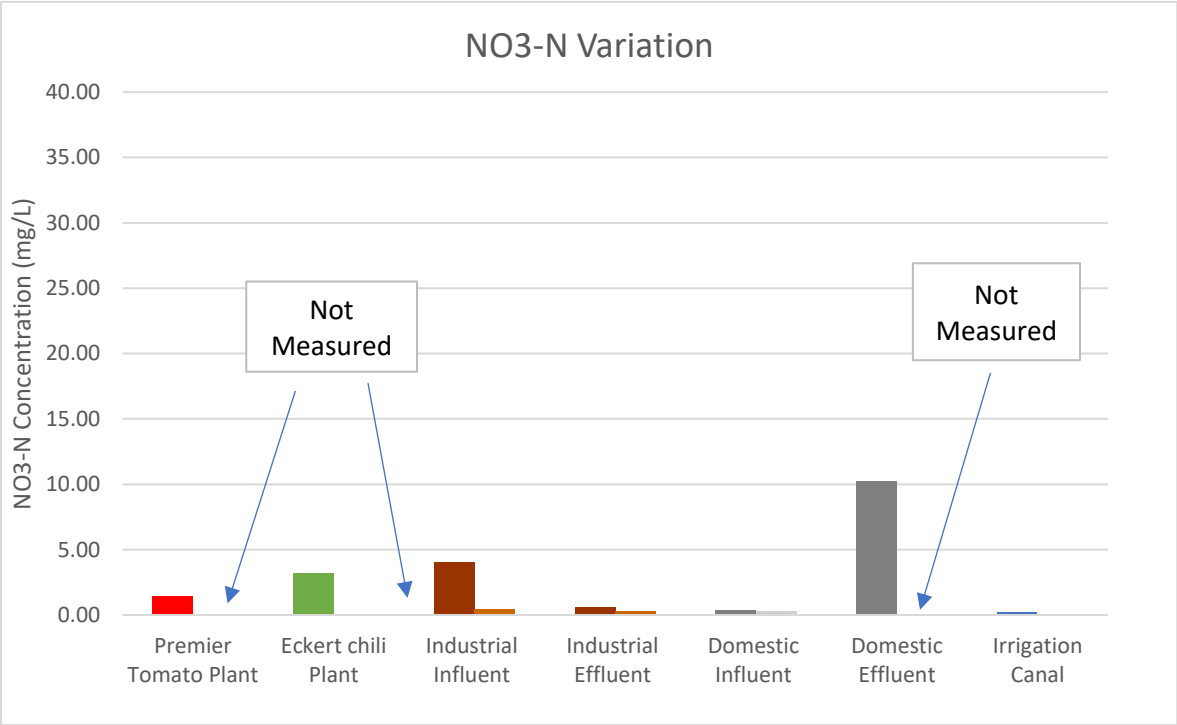


Figure 9 - Filtered Alkalinity from 7/23/19 and 10/3/19.

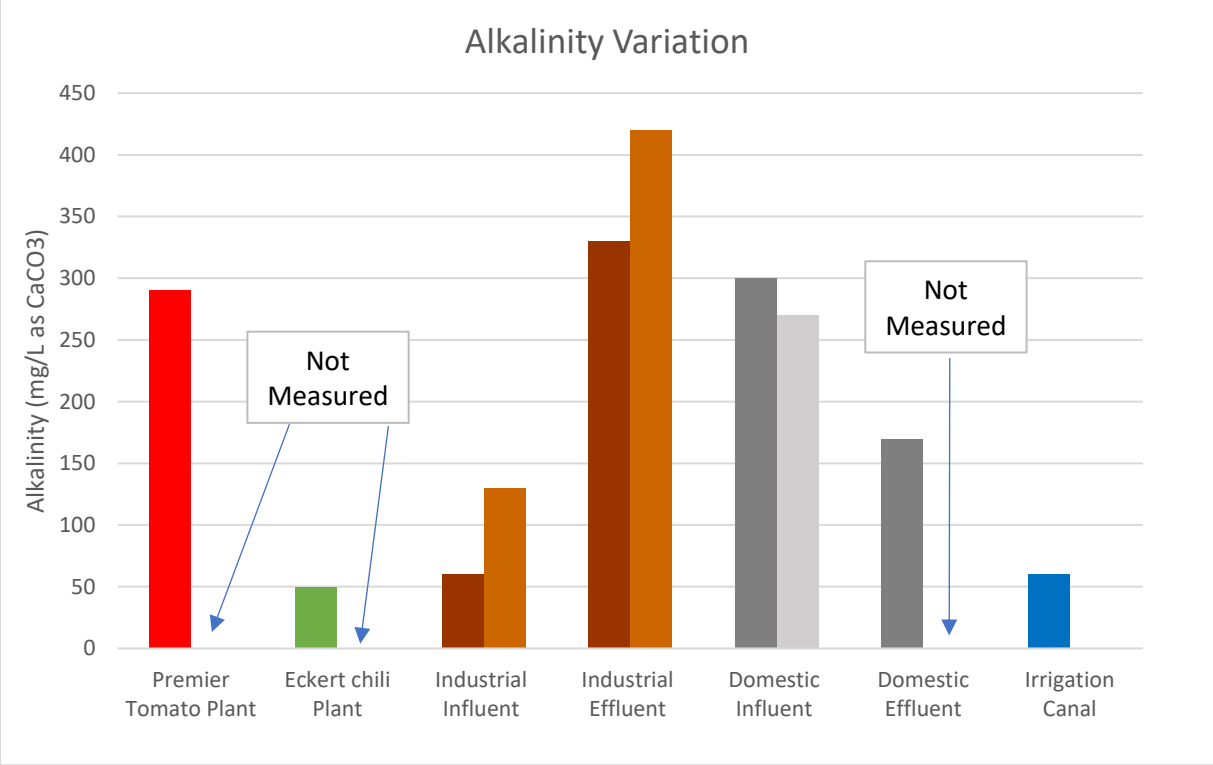
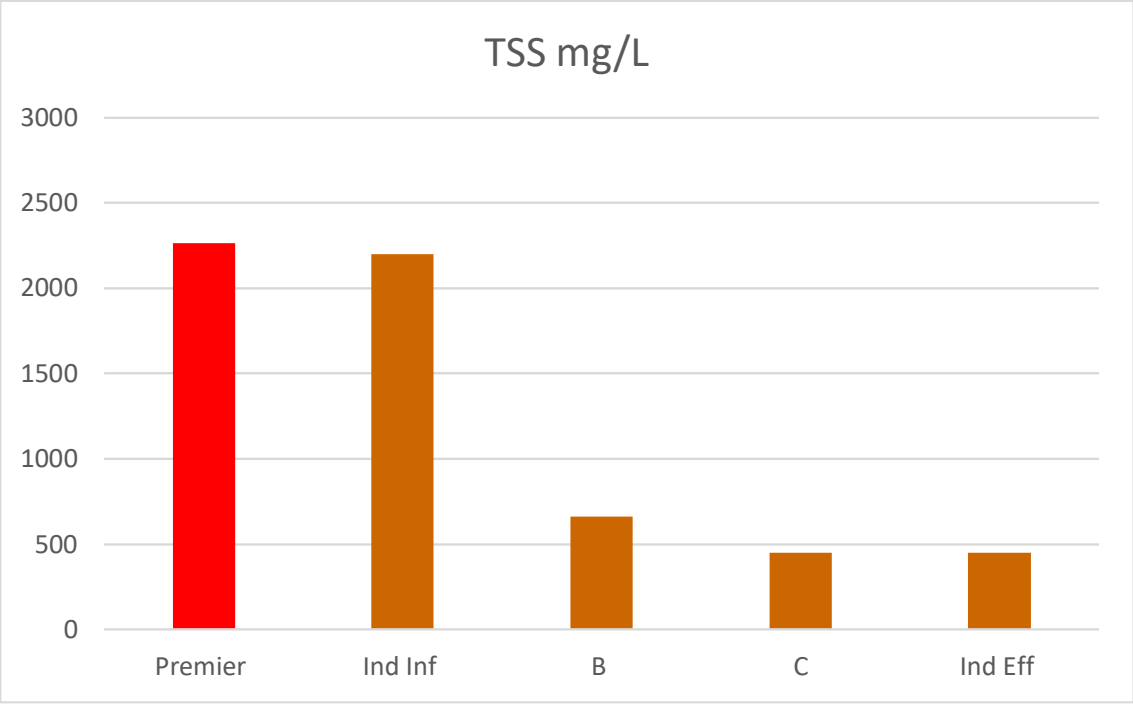


Figure 10 - TSS Concentration Data from 7/23/19 for Premier and Industrial Influent, and 10/3/19 for Site B (Discharge from Ponds 2 and 3) and Site C (Discharge from Ponds 1 and 4) and Industrial Effluent.



3 Solution Planning for Escalon WWTP

Solution 1: Combining percolation facilities will allow cleaning and restoration of capacity

Solution 2: SSJID non-potable canal will accept water if treated better, avoiding need for percolation

Solution 3: New or upgraded treatment shall consider one combined domestic/industrial facility

Solution 4: Pretreatment improvement of Premier wastewater will decrease 90% of facility load

Solution 5: Proper processing and handling of solids will provide key benefits

Solution 1 - Combining Domestic and Industrial Percolation Basins Will Allow Rotation and Cleaning

In June 2019 PACE has exchanged email and phone conversations with the Sacramento office of the Regional Board to consider combining the domestic and industrial percolation areas, to allow for flexibility in applying water to certain basins, while drying, ripping, and restoring capacity in the other basins. According to Scott Armstrong of the Sacramento Office, a short-term variance may be provided to immediately allow this change, and ultimately a new discharge permit will allow this change permanently.

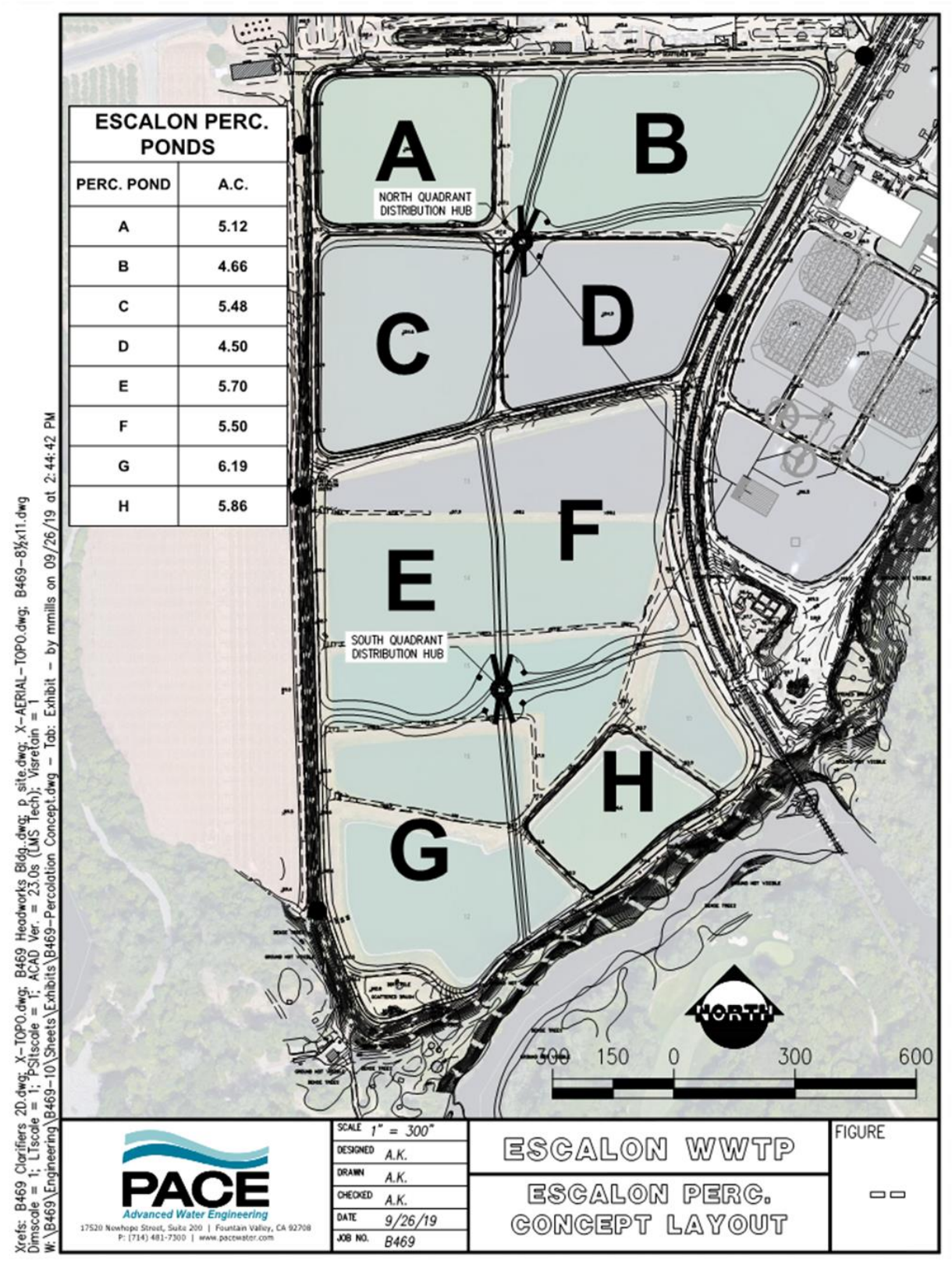
Figure 11 shows a proposed renovated configuration of the percolation basins to allow for an upper and lower quad of basins, with a center hub for fast dewatering required for maintenance of the dried basin. Thus, in each quad two basins are being filled, one is being dried, and one is being ripped for restoration of capacity.

In this new combined percolation configuration, solids removed from the percolation basins that need to be disposed offsite would need to be tested to meet EPA regulations for sewage solids disposal. Because the treatment processes will be updated, only a small fraction of the overall solids from the facilities will come from the percolation basins. In other words, little volume of sludge will be need to be removed and hauled offsite, especially compared with existing operations. Also, because 90% of the overall facilities activated sludge in the summer is industrial in nature, it is expected the removed solids will easily meet requirements for vector attraction and volatile solids destruction, allowing it to be disposed as Class B or A offsite without significant additional cost compared to existing operation.

PERCOLATION BASINS RENOVATION

Per the description in Solution 1 of 5, two “quads” of percolation basins are proposed with an upper and lower elevation discharge hub with four percolation cells surrounding each hub. Effluent can be directed at the hub, and drained from each percolation cell when dewatering is required for ripping and scarifying to improve permeability. The side wall plastic lining systems are ideal for the benefits described, but were not included in the proposed recommended improvements in this phase due to high cost to benefit.

Figure 11 - shows a proposed layout of a renovated two quad percolation system with a total of eight shallow engineered percolation cells for optimized percolation.



Solution 2 - SSJID Non-Potable Canal Will Accept Water if Treated Better, Avoiding Need for Percolation

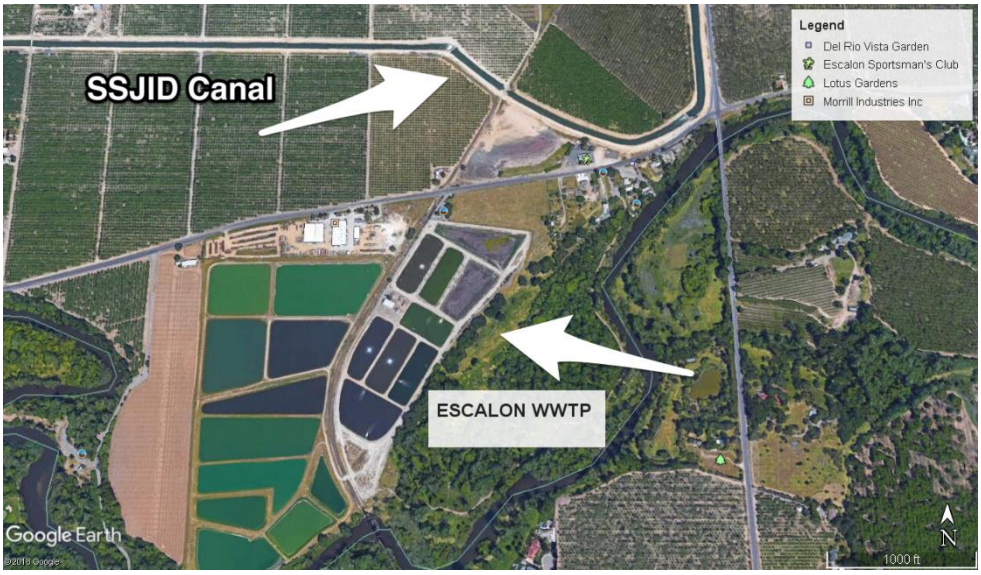
Forrest Killingsworth from SSJID confirmed during May-Oct that well-treated and permit-compliant water supply would theoretically be accepted by SSJID in their adjacent non-potable irrigation canal. SSJID owns and operates several water supply and distribution systems, and the canal and system immediately north of Escalon is 100% non-potable demand, such that there are no potable demands regardless of treatment downstream. Thus, discharge of effluent from the Escalon WWTP is feasible as Title 22 non-potable water for unrestricted reuse (unrestricted purple piped water) under current regulations, and treatment for surface water augmentation for potable drinking water supply is not necessary.

If the treatment processes were kept separate, which is not recommending for effluent proposed to be used for the SSJID canal, then industrial effluent could theoretically be produced at a lesser quality which would theoretically meet State regulations for non-potable reuse. In this case potentially filtration or disinfection would not be required or performed at the same level as domestic effluent. Although technically feasible and potentially permittable, it is not believed to be acceptable by SSJID to receive only partially oxidized, unfiltered, or undisinfected water of any kind. The current level of oxidation of industrial influent, even at 95%, still leaves 5% of up to 3,000 mg/L, or 150 mg/L. Historical data shows COD entering the percolation basins from the industrial plant have often averaged 400-500 mg/L. It is expected COD will need to be consistently reduced to less than 50 mg/L for discharge to SSJID to prevent problems with oxygen in the SSJID canal.

In a combined treatment system, combining industrial and domestic treatment systems, all effluent going to SSJID would be properly oxidized (sufficiently removal of BOD or COD), filtered, and disinfected per State requirements for unrestricted purple piped water. Based on correspondence and standard practice of irrigation in California, it is understood SSJID would accept this combined recycled water supply. Overall the cost of fully oxidizing, filtering, and disinfecting water will likely be a reasonably small percentage of the projected capital cost, and will provide the benefit of reduced or eliminated maintenance and problems with the percolation basins.

Potentially SSJID could subsidize the tertiary treatment (filtration and disinfection) portion of the project to obtain supplemental, high quality, and inexpensive non-potable water supply. At this time SSJID has not been asked their interest in paying for recycled water.

Figure 12 - SSJID Non-Potable Irrigation Canal 3000 feet North of the WWTP May Accept Warm Season Escalon Effluent if Better Treated, Reducing or Eliminating Percolation Basin Maintenance



Solution 3 - New or Upgraded Treatment Shall Consider One Combined Domestic/Industrial Facility

Because there is little existing infrastructure at the Escalon WWTP, only several shallow earthen basins with no liners, a liquid oxygen system, and dozens of inefficient surface aerators, there are few existing assets and few opportunities to reuse existing infrastructure. New facilities will be required to improve the treatment system in order to reduce violations from seeping water offsite, overflowing the percolation basins, reducing odor, and treating water to standards that SSJID will accept in their non-potable canal. Because new facilities are required for these reasons, significant capital infrastructure will be needed to meet minimum compliance and project goals and ideally setup the facility for near-term and future goals including additional capacity. The best way to maximize the value of proposed new capital infrastructure is to design and build and operate one combined facility.

A combined single facility can be planned for simple construction and operation using similar philosophy of the existing Escalon WWTP: earthen basins (lined in this case) with high efficiency aeration and oxidation, modern clarification for removal and processing of solids, cloth disk filtration, and final disinfection in the pipeline that delivers water to the SSJID when applicable. Accepting both types of flows, domestic and industrial, will stabilize the process including neutralizing pH and equalizing loads.

Assuming the Regional Board is in agreement on temporary operating permit modifications for construction of the proposed improvements, a new facility can be constructed in the space currently used for domestic treatment and settling basins, and domestic flows can be processed in the industrial basins during construction. The timing of the construction can also be optimized to perform most of the construction during the months when industrial flows are low. The domestic load is less than $1/10^{th}$ of the industrial load during the warm season when Premier is operating, and adding domestic flows during this period may also be feasible.

Solution 4 - Pretreatment Improvement of Premier Wastewater will Decrease 90% of Facility TSS Load

During three site visits and testing of Premier wastewater effluent, including photos and data included herein, it was evident that excessive solids (TSS), and over 90% of the solids into the Escalon WWTP, comes from the Premier discharge. The Premier onsite pre-treatment systems appeared overwhelmed and unable to adequately remove solids efficiently as described in Problem D above. A Premier company engineer reported on 9/5/19 that Premier has considered a second DAF treatment unit, and at a minimum redundancy and better solids removal is required at Premier to reduce TSS loading to the Escalon WWTP.

As part of this master planning, a microscreen vendor named Nexum was contacted about a pilot for a 200-micron microscreen, which could be deployed for testing and potentially permanently at either Premier or the Escalon WWTP. This microscreen could provide additional insurance against excessive TSS loading from Premier to the Escalon WWTP, with or without the second DAF unit suggested.

It is suggested to begin grab sampling of treated DAF water to obtain data that avoids sampling inaccuracies from a composite samplers tubing being smaller than the sample it is obtaining. Grab sampling will provide a new baseline of TSS into the Escalon WWTP, in order to monitor the required improvements described.

Solution 5 - Proper Processing and Handling of Solids will Provide Key Benefits

Remaining solids in the influent as TSS and generated activated sludge solids from the onsite secondary treatment process will sum to tens of thousands of pounds of solids requiring processing, dewatering, and possibly drying prior to offsite land application and disposal. The solids ideally would be removed from the treatment process into a designated sludge processing and dewatering facility so they can be immediately hauled offsite as they are generated. This would avoid the current practice of having football-field size basins 1/3 filled with wet solids sitting for six months waiting for sun drying and large-scale earthwork excavation and removal.

Several ideas maybe considered for immediate processing of solids including:

Table 5 - Solids Processing Alternatives Considered for Escalon WWTP

SOLIDS PROCESS OPTION	PRIMARY TSS REMOVAL	WAS TSS REMOVAL	DIGESTION	GAS FOR ELECTRIC	DEWATER	DRYING
I	YES	YES	YES	YES	YES	NO
II	YES	YES	YES	NO	YES	YES
III	YES	YES	NO	NO	YES	YES
IV	NO	YES	NO	NO	YES	NO
V	NO	YES	NO	NO	YES	YES

There are various combinations of solids extraction, digestion, electricity generation, and varying levels of dewatering/drying available for the project. Because improvement 4 (enhanced removal of tomato and inorganic TSS at Premier) includes potentially 10X improvement in incoming TSS, primary removal of TSS for digestion will no longer be needed or advantageous, and solids process options I, II, and III can be avoided. Eliminating primary TSS removal and digestion will save substantial capital infrastructure cost. Regarding solids process options IV and V, they would include secondary WAS removal only, thickening to reduce the size of sludge holding tanks, aerated sludge holding for a few days, and dewatering only (solids process option 4) or dewatering and drying (solids process option 5). Ideally dewatering and drying in solids process option 5 could be provided, which would provide Class A Biosolids with the ability to dispose offsite most easily, and reduction in overall hauling volume by 5X over dewatering only. Without drying the combined biosolids will be unclassified (not Class B or A), unless lime stabilization was provided. Drying options include solar drying in enclosed greenhouse buildings with mechanical equipment, or thermal drying systems.

Due to limited project budgets, potentially solids process option IV could be implemented initially, with drying facilities (solids process option V) provided in the future improvements. Assuming TSS from Premier was reduced to permit limits of 200 ppm, a combined facility solids handling may include the pounds of solids and trucks required for hauling without and with drying facilities as shown in Table 5 (5a, 5b, and 5c).

Table 5a - Industrial Solids Analysis and Number of Trucks for Hauling (considering Premier site improvements, microscreen influent TSS capture, future expansion up to 20% above current, and drying)

	w/Micro Screen	Industrial Q	Industrial TSS	Industrial BOD	Industrial WAS TS (dry	Industrial Influent TS (dry)	Industrial TS (dry)	yd3 20% dry	**40 yd3 trucks 20% dry**	yd3 90% dry	**40 yd3 trucks 90% dry**
CURRENT	YES	1.8	2000	2000	24019	30024	54000	181.8	**4.5**	40.4	**1.0**
PROPOSED*	YES	1.8	300	2000	24019	4504	28500	96.0	**2.4**	21.3	**0.5**
PROPOSED*	NO	1.8	0	2300	27622	0	27600	92.9	**2.3**	20.6	**0.5**
EXPANDED	YES	2.2	300	2000	29357	5504	34900	117.5	**2.9**	26.1	**0.7**
EXPANDED	NO	2.2	0	2300	33760	0	33800	113.8	**2.8**	25.3	**0.6**
**with solution 4 provided at Premier for enhanced TSS removal*											

Table 5b - Domestic Solids Analysis and Number of Trucks for Hauling (considering Premier site improvements, microscreen influent TSS capture, future expansion up to 20% above current, and drying)

		Domestic Q	Domestic TSS	Domestic BOD	Domestic WAS TS (dry	Domestic Influent TS (dry)	Domestic TS (dry)	yd3 20% dry	**40 yd3 trucks 20% dry**	yd3 90% dry	**40 yd3 trucks 90% dry**
CURRENT	YES	0.5	250	250	834	1043	1900	6.4	**0.2**	1.4	**0.0**
PROPOSED	YES	0.5	250	250	834	1043	1900	6.4	**0.2**	1.4	**0.0**
PROPOSED	NO	0.5	0	350	1168	0	1200	4.0	**0.1**	0.9	**0.0**
EXPANDED	YES	0.6	250	250	1001	1251	2300	7.7	**0.2**	1.7	**0.0**
EXPANDED	NO	0.6	0	350	1401	0	1400	4.7	**0.1**	1.0	**0.0**

Table 5c - Combined Industrial and Domestic Solids Analysis and Number of Trucks for Hauling (considering Premier site improvements, microscreen influent TSS capture, future expansion up to 20% above current, and drying)

TOTALS											
PROPOSED	NO						28800	97	**2.4**	21.5	**0.5**
EXPANDED	NO						35200	118.5	**3.0**	26.3	**0.7**

As shown in ORANGE in Tables 5a, 5b, and 5c, using current flow and load, with Premier installing TSS removal improvements, and no microscreening of influent TSS, the combined facility will require just over 2 full 40 yd3 trucks of 20% dry cake per day if not dried. With drying, the number of trucks reduces to about ½ per day. If the facility is expanded by 20% in industrial and 20% in domestic, the projected number of trucks per day would increase to three per day undried, and ¾ of a truck per day if dried.

4 Solution Planning for Escalon WWTP

Considering the recommendations provided in solutions 1-5 herein, the following improvements shall be planned for implementation in one or more phases as follows to provide firm, reliable, and efficient capacity of the existing generation and projected mid-term expanded flow and load. At a minimum the proposed improvement project shall consider peaking, peak loading and peak flows, and also provide 20-50% over capacity of those peak design conditions to allow for future additional flows. As a rule of thumb, WWTPs are generally planned for expansion when at 80% of their design capacity, so a renovated treatment facility ideally is sized for 20% overcapacity from existing wastewater generation, with proper redundancy and emergency storage systems considered. There is a large economy of scale when installing materials and equipment, and increasing the size of the facility from 1.2X (20% overcapacity) to 1.4-1.5X the existing generation may only cost an extra 10% for example.

The proposed planning includes the intent to combine the domestic and industrial flows, treatment trains, and percolation basin systems as previously described. It is intended to permit these combined systems as described. Other nearby Cities including Oakdale, Manteca, and Lathrop combine industrial and domestic flows in one facility, and specifically Lathrop recently closed their industrial WWTP to send industrial flows into a new combined treatment plant. Even with a combined treatment approach with combined permitting, the treatment trains may still be setup for intentional separation by the operator. The only way to permit certain basins as industrial or domestic solely would be to create four headworks trains, one plus one redundant per type of process flow, and this should be avoided to minimize capital and maintenance costs.

Six alternatives were considered for the enhancements of the facility:

ALTERNATIVE 0 – DO NOTHING / RENOVATE EXISTING

There are limited options for improving treatment and performance with the existing facility and infrastructure. Potentially receiving a permit to combine the percolation basins immediately will provide some relief from high level in the percolation basins. Unfortunately, there are multiple problems with avoiding a new facility:

1. SSJID will not accept flows if they are not properly treated.
2. If SSJID does not accept flows and continued high TSS/high COD water is sent to the percolation basins, or water in general is sent to the existing percolation basins, problems with high level or overflow may occur.
3. Continued odors will occur from partially oxidized wastewater, nutrient deficient industrial water (a lack of nutrients nitrogen and phosphorus for the industrial activated sludge), and drying sludge for 6 months.
4. There is nutrient deficiency in the industrial wastewater, which limits COD removal, domestic wastewater contains the required deficient nutrients.
5. There is little redundancy or safety factor such that one or more basins out of service can cause problems with treatment or percolation.

ALTERNATIVE 1A – COMBINED FACILTY WITH ONLY MINIMAL/NECESSARY COMPONENTS, SIZED TO ACCOMMODATE EXISTING LOADS ONLY WITH LOW SAFETY FACTOR, UPGRADED PERCOLATION PONDS WITH NO SSJID DISCHARGE

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. Depending on the desired design capacity either three or four secondary basins will be required, and both configurations were modeled herein. The 10% layout and cost estimates included herein assume three secondary basins, which is based on reduced COD from better TSS removal from Premier. The 10% layout and cost estimates included herein assume two clarifiers based on a reasonable surface clarification rate of 600 gpd/ft2 at up to 6 MGD peak flow.

Tertiary treatment is not provided in this alternative, and effluent cannot be discharged to SSJID. The percolation basins in this alternative would be re-graded and side-wall lined to allow frequent drying, transfer from basin to basin, and maintenance scarifying and ripping. Finally, only three days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to hauling offsite for disposal. No sludge thickening is provided in this alternative. Careful wasting schedules from the secondary basins with almost immediate dewatering and hauling for disposal will be required in the summer in this alternative. Future thickening, additional storage, and drying to Class A Biosolids is not included in the first phase approach to reduce capital cost. A small odor control system is provided for the headworks only in this alternative. There is no headworks and sludge screen wall or building in this alternative. There is no ESB return flows pump station in this alternative.

ALTERNATIVE 1B – COMBINED FACILTY WITH ONLY MINIMAL/NECESSARY COMPONENTS, SIZED TO ACCOMMODATE EXISTING LOADS ONLY WITH LOW SAFETY FACTOR, ½ FLOW TREATED FOR SSJID DISCHARGE

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. This alternative assumes three secondary basins, which is based on reduced COD from better TSS removal from Premier. The 10% layout and cost estimates included herein assume two clarifiers based on a reasonable surface clarification rate of 600 gpd/ft2 at up to 6 MGD peak flow.

Tertiary treatment consisting of cloth disk filtration and chlorine disinfection, as well as offsite piping to SSJID is also included in the proposed treatment upgrade for half of the combined peak summer flows. The percolation basins in this alternative would not be upgraded, although they are to be permitted for combined industrial and domestic operation. Finally, only three days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to hauling offsite for disposal. No sludge thickening is provided in this alternative. Careful wasting schedules from the secondary basins with almost immediate dewatering and hauling for disposal will be required in the summer in this alternative. Future thickening, additional storage, and drying to Class A Biosolids is not included in the first phase approach to reduce capital cost. A small odor control system is provided for the headworks only in this alternative. There is no headworks and sludge screen wall or building in this alternative. There is no ESB return flows pump station in this alternative.

ALTERNATIVE 2A – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, PLUS PERCOLATION BASIN UPGRADES (NO TREATMENT FOR SSJID CONNECTION)

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. This alternative assumes three secondary basins, which is based on reduced COD from better TSS removal from Premier. The 10% layout and cost estimates included herein assume two clarifiers based on a reasonable surface clarification rate of 600 gpd/ft2 at up to 6 MGD peak flow.

Tertiary treatment is not provided in this alternative, and effluent cannot be discharged to SSJID. The percolation basins in this alternative would be re-graded and side-wall lined to allow frequent drying, transfer from basin to basin, and maintenance scarifying and ripping. Sludge thickening, plus six days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to hauling offsite for disposal. Future drying to Class A Biosolids is not included in the first phase approach to reduce capital cost.

ALTERNATIVE 2B – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, ½ FLOW TREATED FOR SSJID DISCHARGE

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. This alternative assumes three secondary basins, which is based on reduced COD from better TSS removal from Premier. The 10% layout and cost estimates included herein assume two clarifiers based on a reasonable surface clarification rate of 600 gpd/ft2 at up to 6 MGD peak flow.

Tertiary treatment consisting of cloth disk filtration and chlorine disinfection, as well as offsite piping to SSJID is also included in the proposed treatment upgrade for half of the combined peak summer flows. The percolation basins in this alternative would not be upgraded, although they are to be permitted for combined industrial and domestic operation. Sludge thickening, plus six days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to hauling offsite for disposal. Future drying to Class A Biosolids is not included in the first phase approach to reduce capital cost.

ALTERNATIVE 2C – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, ½ FLOW TREATED FOR SSJID DISCHARGE, PLUS PERCOLATION BASIN UPGRADES

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. This alternative assumes three secondary basins, which is based on reduced COD from better TSS removal from Premier. The 10% layout and cost estimates included herein assume two clarifiers based on a reasonable surface clarification rate of 600 gpd/ft2 at up to 6 MGD peak flow.

Tertiary treatment consisting of cloth disk filtration and chlorine disinfection, as well as offsite piping to SSJID is also included in the proposed treatment upgrade for half of the combined peak summer flows.

The percolation basins in this alternative would be re-graded and side-wall lined to allow frequent drying, transfer from basin to basin, and maintenance scarifying and ripping. Sludge thickening, plus six days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to hauling offsite for disposal. Future drying to Class A Biosolids is not included in the first phase approach to reduce capital cost.

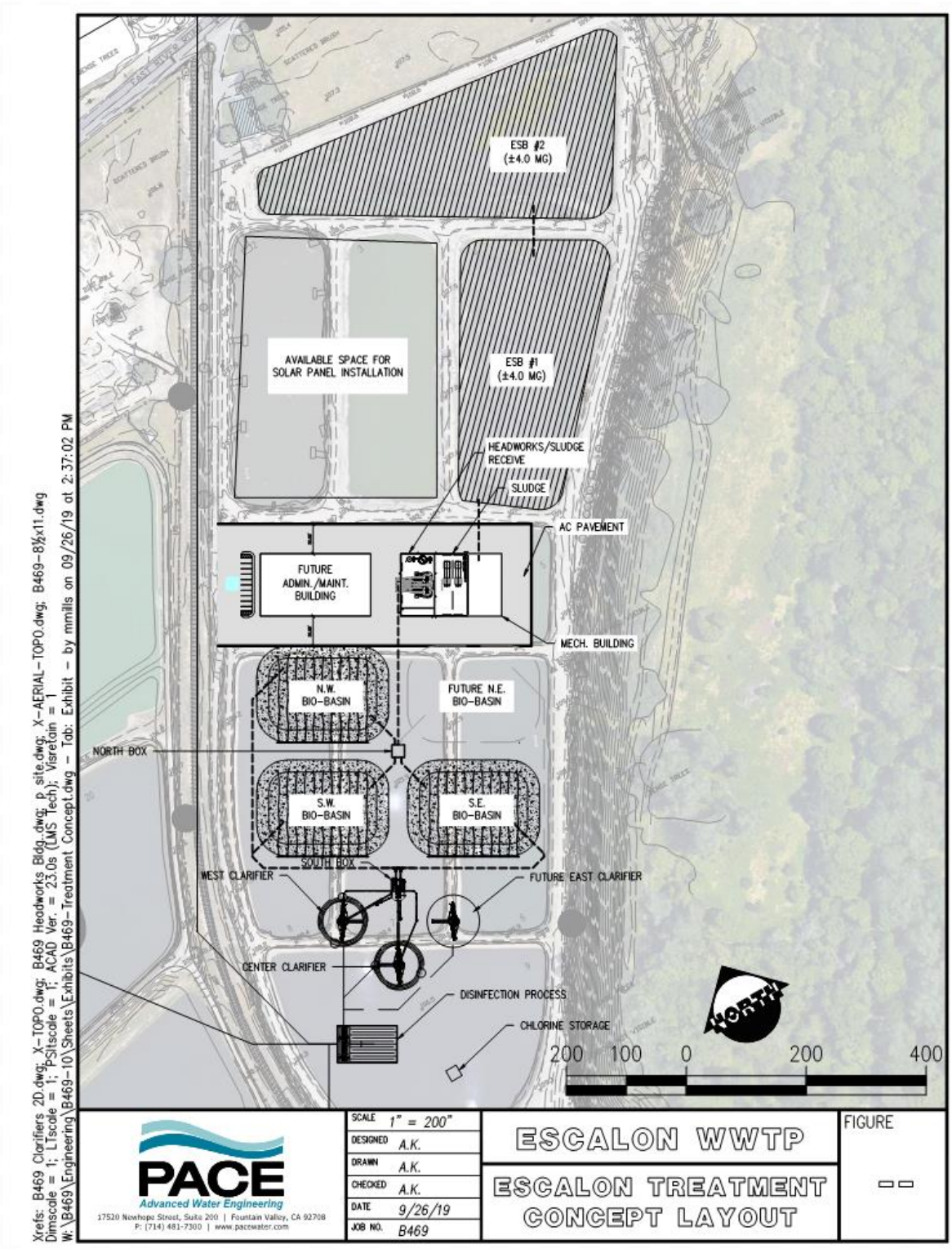
ALTERNATIVE 3 – IDEAL NEW COMBINED FACILTY WITH 100% TREATMENT FOR SSJID, SLUDGE DRYING, SIZED TO ACCOMMODATE UP TO 25% EXTRA CAPACITY, FULL PERCOLATION BASIN GRADING AND LINING

The proposed system would include construction of new treatment systems utilizing 6mm headworks screening, existing basin-type secondary processing similar to existing, with deeper basin depths, basin lining, modernized aeration and clarification, and convergence boxes with gates to distribute flows between unit processes. This option assumes four secondary basins for higher inflow and loading up to 20% additional capacity. A third secondary clarifier is optional depending on loading and facility performance, and is not included in this alternative (or any alternative presented).

Tertiary treatment of 100% of the summer combined flows consisting of cloth disk filtration and chlorine disinfection, as well as dual offsite transfer pipes to SSJID is also included in this treatment upgrade alternative. The percolation basins in this alternative would be re-graded and side-wall lined to allow frequent drying, transfer from basin to basin, and maintenance scarifying and ripping. Sludge thickening, plus six days of covered, mixed, and aerated sludge storage is proposed with screw press dewatering to +/-18% dryness prior to drying to +/-90% Class A biosolids and hauling offsite for reuse. The volume reduction in this alternative will drastically reduce the quantity of sludge hauling trucks and disposal costs, although additional operations and maintenance will be present to operate the sludge drying system.

Figure 13 shows a proposed layout of Alternative 1, 2B, or 2C systems of a new combined approximately 2.6 MGD treatment system (depending on the COD and TSS loading) constructed above the existing domestic treatment system. Domestic wastewater would be processed through the existing industrial during construction, requiring a modification of the permit for this duration.

Figure 13 - Preliminary Concept Layout of Combined Treatment System with Approximate 3.0 MGD Capacity



CAPACITY NEEDED FOR COLLECTION, CONVEYANCE, TREATMENT

The City of Escalon currently has approximately 2,500 equivalent dwelling units (EDUs) plus commercial, which generate approximately 0.5 MGD of average dry weather wastewater generation. The domestic wastewater is relatively consistent with season. It is understood over the next 20 years up to 50 EDUs per year could be added, for a total additional wastewater generation of approximately 1000 EDUs. At 250 gpd/EDU for modern residential development, an extra 0.25 MGD of average day domestic wastewater generation can be anticipated at the end of 20 years, with incremental increases annually depending on the quantity of EDUs added per year.

Recently an upgrade to the City's domestic wastewater collection system and sewer lift station have been provided to improve reliability and increase the capacity of the collection system. The increase in the collection system will be able to be matched with comparable increases in treatment capacity by verifying the total facility design loading, corresponding to potential increases in the number of secondary basins to four and clarifiers to three if required.

Using the existing combined maximum month flow of 2.6 MGD as a baseline, 0.25 MGD of additional domestic generation plus a reported desired increase in Eckart flows up to 0.6 additional, would increase the needed WWTP to 3.5 MGD in the next 20 years. ***Ideally this phase of proposed treatment improvements could treat this anticipated expanded treatment generation of 3.0 MGD.***

Biological treatment models included herein include better Premier pretreatment to TSS < 300 mg/L. Three models are provided herein:

MODEL 1 - existing peak month combined flow of 2.6 MGD

MODEL 2 – small expansion to combined flow of 3.0 MGD

MODEL 3 – large expansion to combined flow of 3.5 MGD

In MODEL 1 only three secondary basins can relatively easily treat the anticipated wastewater generation. In MODEL 3 four secondary basins and additional air is required to treat the anticipated generation. MODEL 2 currently also shows only three secondary basins are required, although the factor of safety is lower than in MODEL 1. Additional design phase analysis will be required to confirm three secondary basins can accommodate up to 3.0 MGD of peak month flows.

Alternatives 1A, 1B,, 2A, 2B, or 2C planning and cost estimates currently are planned with only three secondary basins and two secondary clarifiers based on perceived efficiency gains from Premier TSS removal improvement, depending on loading assumptions and air/oxygen provided.

PREMIER PRE-TREATMENT ENHANCEMENT

A second equally sized DAF or greater shall be provided to provide some redundancy, prevention of bypass flows during outage of the primary DAF, and enhance TSS removal to less than 300 ppm consistently.

Photograph 7 - Existing Large Premier DAF Pre-Treatment Unit Requires DAF Redundancy and Additional Capacity to Consistently Treat the Load from the Tomato Process Wastewater to Less than 300 mg/L TSS. A Microscreen is Also Suggested Downstream of the DAF unit(s) to Provide Further Assurance of Meeting the Desired TSS Objectives at Premier.

PRIMARY HEADWORKS

Assuming pre-treatment improvements at Premier to lower TSS, it is recommended to provide standard 6 mm perforated plate headworks screening followed by grit removal. Two headworks trains shall be provided such that one of the two trains can effectively handle the peak hour flow with the other train out of service. The headworks systems may be pre-packaged in 316 stainless tanks, or may be installed in cast in place concrete. The pre-packaged units may offer advantages of lower construction cost and less risk of startup issues from custom mechanical and electrical provided in the field. All of the headworks screenings and grit removal shall be dewatered, conveyed to baggers, and hauled to a landfill.

SECONDARY PROCESS - BIOWIN PROCESS MODELING

BioWin models were created to simulate the performance of the Extended Aeration Activated Sludge (EAAS) basins including Parkson “Biolac” or “Bioworks” or others. The analysis was performed for both the current and proposed flow and loading conditions. The models can be used to determine the aeration required for the secondary treatment process, evaluate the performance of the secondary clarifiers and estimate the sludge production. The models assumed the use of standard aeration blowers using air. Alternatively, the EAAS basin aeration system can be supplemented with pure oxygen, and the appendix includes a proposal from BlueInGreen dissolved oxygen system, which can be used.

The first model simulated the existing loading conditions at a lower design flow of 2.6 MGD using July 2019 sampling concentrations, and used three (3) EAAS basins and two (2) secondary clarifiers. The second model simulated the proposed loading conditions at a future design flow of 3.0 MGD and used three (3) EAAS basins and two (2) secondary clarifiers. The third model simulated the proposed loading conditions at a future design flow of 3.5 MGD and used four (4) EAAS basins and two (2) secondary clarifiers. All three models incorporated conservative reductions in TSS load from enhanced pre-treatment at Premier. By providing additional TSS removal at Premier, the secondary capacity will be increased. The precise capacity of the proposed treatment system will be determined during the design phase, based on updated data and influent assumptions.

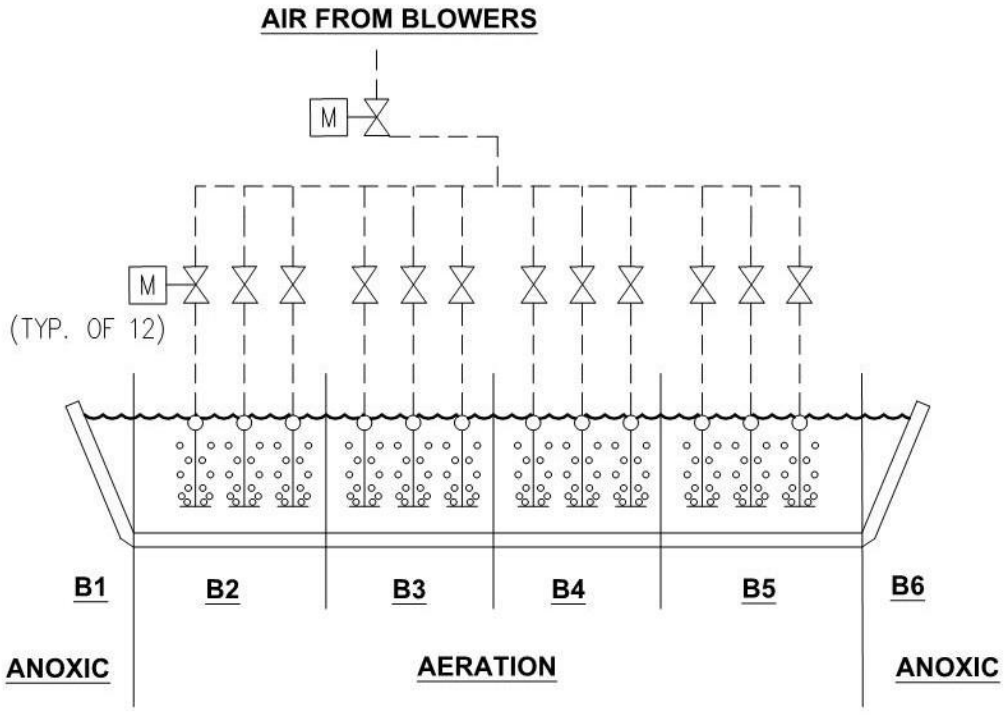
The influent parameters used for each model can be found in Table 6 below. The process flow sheets for the BioWin models can be found in Appendix B.

Table 6 - BioWin Influent Parameters

Influent	Units	2.6 MGD	3.0 MGD	3.5 MGD	*Objective/Note*
Temperature	°C	20	20	20	-
Total COD	mgCOD/L	2475	2475	2475	***0.6 mgBOD/mgCOD***
Total BOD	mgBOD/L	1423	1423	1423	-
TSS	mg/L	379	379	379	-
VSS	mg/L	289	289	289	***0.7 mgVSS/mgTSS***
TKN	mgN/L	50	50	50	-
Ammonia	mg/L	26.4	26.4	26.4	***0.528 gNH3/gTKN***
Nitrate N	mgN/L	0.3	0.3	0.3	-
Total Phosphorus	mgP/L	16	16	16	***Phosphorus addition required***
pH	unitless	7.3	7.3	7.3	***Default BioWin value***
Alkalinity	mg/L	300	300	300	***Default BioWin value***
Calcium mg/L	mg/L	80	80	80	***Default BioWin value***
Magnesium	mg/L	15	15	15	***Default BioWin value***

In the model each secondary basin was divided into 6 sections to model the anoxic and aerobic conditions of the EAAS treatment process; (2) constant Anoxic Section on both ends of the basins and (4) aeration sections across the middle (Figure 14). All sections of each basins were assumed to be fully mixed to simulate a plug flow system.

Figure 14 - BioWin Model Basin Diagram



Basin zones B1 and B6 were assumed always anoxic since the floating fine bubble aeration systems used in EAAS treatment processes do not typically cover the water surface over this portion of the basin. The remaining aerated volume was evenly divided into four sections (B2, B3, B4, and B5) to evaluate the treatment performance across the basin and allow for alternating aeration patterns if needed. The diffuser parameters used in the model are similar to values representing floating fine bubble diffusers typically used in EAAS treatment processes. The DO set point for each aeration section was adjusted so that the BioWin model would predict a required aeration value for a specific section of the EAAS basin. The total required aeration for each basin is the sum of all four aeration sections and is shown below in Table 7.

The clarifiers modeled in BioWin were 80-ft in diameter with a sidewall depth of 16-ft and a sludge blanket height of about 2.08-ft. The BioWin model assumed a percent removal for each clarifier of approximately 99.8%. The Return Activated Sludge (RAS) and Waste Activated Sludge (WAS) flow rates were adjusted to produce a Mixed Liquor Suspended Solids (MLSS) concentration that would provide secondary treatment that reduced the BOD, TSS and Ammonia concentrations below the effluent treatment objectives without overloading the clarifiers. The process parameters used in the BioWin model can be found below in Table 7.

Table 7 - BioWin Process Parameters

Secondary Basins	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Number of Basins	quantity	3	3	4	-
Basin Side Water Depth	feet	16	16	16	-
Total Anoxic Volume (per basin)	MG	0.29	0.29	0.29	-
Total Aeration Volume (per basin)	MG	2.60	2.60	2.60	-
Total Volume (per basin)	MG	2.89	2.89	2.89	-
HRT	hours	80	69.3	79.2	-
SRT	days	17	16.6	16.5	-
MLSS	mg/L	3591	4056	3526	***< 4,500 mg/L***
Process Flows	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
RAS Flow	x Qin	0.4 Q	0.367 Q	0.343 Q	-
	MGD	1.04	1.1	1.2	-
WAS Flow	% Qin	6.54	5.33	6.0	-
	MGD	0.17	0.16	0.21	-
Aeration	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Total Aeration Required (per basin)	cfm	4426	5147	4430	-
Total Diffusers (per basin)	qty	480	480	480	-
Alpha F	constant	0.55	0.55	0.55	-
Beta	constant	0.95	0.95	0.95	-
Diffuser Surface Area	ft^2	3.03	3.03	3.03	-
Diffuser Mounting Height	feet	3	3	3	-
Aeration Schedule	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
(Anoxic) B1 DO Set Point	mg/L	0.0	0.0	0.0	***Unaerated***
(Aeration) B2 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B3 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B4 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B5 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Anoxic) B6 DO Set Point	mg/L	0.0	0.0	0.0	***Unaerated***
Clarifier	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Number of Clarifiers	quantity	2	2	2	-
Surface Area (80Ø)	ft^2	5026	5026	5026	-
Side Wall Depth	feet	16	16	16	-
Surface Overflow Rate	gal/(ft^2 d)	242	283	327	***< 1000***
Solids Loading Rate	lb/(ft^2 d)	10.85	13.81	13.76	***< 35***

The estimated sludge production and effluent quality for the EAAS secondary treatment process is shown below in Table 8.

Table 8 - BioWin Sludge Production and Effluent Quality

Solids	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Sludge Concentration	mg/L	10791	13172	11730	***< 30000***
Sludge Produced	lb/d	15299	17577	20544	-
Yield Check	ratio	0.38	0.44	0.51	***0.8***
Effluent	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Flow	MGD	2.43	2.84	3.29	-
COD	mgCOD/L	41.7	53.19	51.72	-
BOD	mgBOD/L	5.09	12.83	12.79	***< 30***
TSS	mg/L	10.76	11.71	10.07	***< 30***
Ammonia (NH3)	mgN/L	0.5	0.31	0.32	***< 0.5***
Nitrate	mgN/L	0	0	0.0	***< 10***
Nitrite	mgN/L	0	0	0.0	***< 1.0***
Total Nitrogen	mgN/L	2.31	2.18	2.08	***< 10***
Total Phosphorus	mgP/L	0.94	0.93	0.90	***< 1.0***
pH	unitless	7.02	6.96	6.97	***6.5 to 8.5***
Alkalinity	mmol/L	4.18	4.22	4.22	-
Alkalinity	mg/L	209	211	211	-

FILTRATION AND DISINFECTION

Downstream of the proposed secondary clarifiers, clarified water could be sent directly to existing percolation basins. Alternatively, in order to meet Title 22 standards for reuse and discharge to the SSJID canal system, filtration including cloth disk filters maybe provided to achieve low TSS and low turbidity (less than 2 NTU) effluent. This filtration step could also assist in reducing the clogging, maintenance, and sludge removal currently required in the percolation basins. When discharging to the SSJID system, disinfection will occur with injection of free chlorine in the form of sodium hypochlorite at the upstream end of the pipeline to maintain a residual concentration averaging 5ppm in the pipeline contactor on the way to the canal. The minimum 90 minutes contact time will provide the disinfection needed to meet Title 22 disinfection of 450 mg/L min and less than 2.2 total coliform forming units per 100 mL.

SOLIDS PROCESSING AND TREATMENT

As described in Solution 5 of 5, the ultimate solution for solids would be to store sludge for 3-6 days until sludge can be dried to 90%, converted to Class A for nearly unrestricted reuse of Biosolids, and reused nearby to the project site. It is assumed the capital cost for the drying system is not available in the first phase, and the first phase construction project includes dewatering to 18% and hauling for disposal.

CAPITAL (CAPEX) AND ANNUAL OPERATION (OPEX) COST ESTIMATES

Appendix A shows the breakdown of estimated planning level CAPEX cost estimates for Alternatives 1A, 1B, 2A, 2B, 2C, and 3. Table 9 shows a summary of these CAPEX estimates.

Table 9 - Summary of 10% Projected CAPEX for Each Alternative (Alt 3 Has Approx. Combined Capacity of 3.5 MGD, Other Alternatives have Combined Capacity Estimated Between 2.6 - 3.0 MGD Depending on Loading Assumptions)

	CAPEX EST SUMMARY	ALT 1A - REDUCED / PERC ONLY (NO FILT TO SSJID)	ALT 1B - REDUCED / 1/2 FLOW TO SSJID / NO PERC	ALT 2A - PERC ONLY / NO FILT TO SSJID	ALT 2B - 1/2 FLOW TO SSJID, NO PERC	ALT 2C - 1/2 FLOW TO SSJID & PERC	ALT 3 - IDEAL W/100% TO SSJID, DRYING, +25% CAPACITY	avg
	TOTAL NO CONTINGENCY	$ 10,841,198	$ 12,176,263	$ 12,649,598	$ 14,189,263	$ 14,716,698	$ 18,847,160	100%
	15% CONTINGENCY	$ 1,626,180	$ 1,826,439	$ 1,897,440	$ 2,128,389	$ 2,207,505	$ 2,827,074	
	TOTAL WITH CONTINGENCY	$ 12,500,000	$ 14,000,000	$ 14,500,000	$ 16,300,000	$ 16,900,000	$ 21,700,000	
A	GENERAL SITE CONSTRUCTION	$ 990,680	$ 990,680	$ 1,193,680	$ 1,193,680	$ 1,193,680	$ 2,204,240	9%
B	EMERGENCY BYPASS AND PUMP BACK	$ 80,000	$ 80,000	$ 405,000	$ 405,000	$ 405,000	$ 405,000	2%
C	HEADWORKS	$ 1,213,000	$ 1,213,000	$ 1,313,000	$ 1,313,000	$ 1,313,000	$ 1,313,000	9%
D	PERCOLATION BASINS	$ 399,572	$ -	$ 399,572	$ -	$ 399,572	$ 399,572	2%
E	SECONDARY PROCESS	$ 3,280,276	$ 3,280,276	$ 3,280,276	$ 3,280,276	$ 3,280,276	$ 3,430,276	23%
F	FILTRATION	$ -	$ 743,578	$ -	$ 743,578	$ 743,578	$ 1,412,156	5%
G	DISINFECTION & DISCHARGE TO SSJID/PERC	$ -	$ 667,407	$ -	$ 822,407	$ 822,407	$ 1,047,407	5%
H	AERATED SLUDGE HOLDING/THICKENING	$ 1,019,500	$ 1,019,500	$ 1,761,500	$ 1,761,500	$ 1,761,500	$ 1,761,500	11%
I	SLUDGE DEWATERING	$ 1,180,000	$ 1,180,000	$ 1,180,000	$ 1,180,000	$ 1,180,000	$ 2,255,000	10%
J	DEMO/SALVAGE	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	0%
K	20% OVERHEAD, TAXES, BONDING, INSURAN	$ 1,642,606	$ 1,844,888	$ 1,916,606	$ 2,149,888	$ 2,229,803	$ 2,855,630	15%
M	12% DESIGN, PERMIT, CONST MANAGE	$ 985,563	$ 1,106,933	$ 1,149,963	$ 1,289,933	$ 1,337,882	$ 1,713,378	9%

The estimated capital cost of the 10% master planned facility is approximately $12.5M (Alternative 1A) - $21.7M (Alternative 3) including overhead, soft costs for design, permitting, and construction management, and 15% contingency as shown.

Alternative 2B is recommended as the preferred alternative for the first phase of the project due to perceived advantages of: 1.) discharge of ½ effluent to SSJID in the summer, 2.) larger safety factor in treatment and solids processing compared to Alternative 1, and 3.) additional odor control and automated emergency storage pump-back compared to Alternative 1. Alternative 3 has 25% larger capacity and drying capability, which may be important for future growth opportunities and minimizing sludge hauling and disposal costs.

Comparing Alternative 1A or 1B, if one of these alternatives is required due to budget constraints, Alternative 1B allows discharge of ½ the summer effluent flow to SSJID, which eliminates problems with percolation capacity, and is thus recommended over Alternative 1A.

The existing annual operations and maintenance cost of approximately $2M per year is expected to decrease by up to $0.5M per year, including elimination of violations fines. An planning level annual OPEX budget is provided in Table 10.

Table 10 - Preliminary 10% Projected OPEX with Upgraded Facility (Alternative 1B – 2.6 MGD)

	TOTAL NO CONTINGENCY	$	1,413,039
	CONTINGENCY 10%	$	141,304
	TOTAL WITH CONTINGENCY	**$**	**1,554,343**
A	*Power/Oxygen*	*$*	*422,823*
B	*Chemical*	*$*	*119,335*
C	*Sludge Hauling/Dispose*	*$*	*298,855*
D	*Odor Control Carbon Replacement*	*$*	*25,000*
E	*Labor*	*$*	*233,600*
F	*Lab and Reporting*	*$*	*7,500*
G	*Maintenance*	*$*	*97,333*
H	*Percolation Maintenance*	*$*	*71,094*
I	*Misc Repair/Replace*	*$*	*137,500*

PROJECT FUNDING CONSIDERATIONS

All of the proposed WWTP improvements alternatives considered, except for Alternative 0, are expected to reduce the annual operations and maintenance by at least $0.25M per year. 20 years of potential operations and maintenance cost reduction could save on the order of $5,000,000, not considering the time value of money.

All of the proposed WWTP improvements alternatives considered, except for Alternative 0 and 1A, are expected to significantly reduce the chances for violations and fines. Alternative 1B does not have significant odor control or ESB return pumping, and could also have continued problems with odor emissions. Reduction of fines is a second potential reduction in operating cost, which is not quantified herein.

By opening up 0.25 MGD of additional domestic capacity, and eliminating the moratorium on new EDUs in the City, potentially up to $6,100 per EDU sewer connection fee revenue is available, summing to $6.1M for 1000 new EDUs over time. Also, the sewer connection fee has not been evaluated since 2007, and likely will be increased by 20-50% for inflation and other factors.

The expansion of industrial processing capacity will also have value to Eckart and the City. Assuming an additional 0.15 MGD of short-term capacity is provided to Eckart, at a connection fee of 2X the domestic connection fee rate (based on lbs COD basis), potentially $7.3M of connection fee revenue would be available from Eckart.

Summing the potential savings in operations and maintenance cost for 20 years, plus potential future connection fee revenue opportunity from 0.25 MGD of domestic and 0.15 MGD of industrial capacity expansion, a potential total future savings/revenue could offset a large amount of the proposed CAPEX needed for alternative 2B, including bond financing charges.

Alternatively, or in combination with operations and maintenance savings and connection fee revenue, there are opportunities for Water Quality Grant funding through Proposition 1 or low-interest loan financing through California or the Federal Government.

APPENDIX A

Solution Planning Alternative Cost Estimates

APPENDIX A

Solution Planning Alternative Cost Estimates

ALTERNATIVE 1A – COMBINED FACILTY WITH ONLY MINIMAL/NECESSARY COMPONENTS, SIZED TO ACCOMMODATE EXISTING LOADS ONLY WITH LOW SAFETY FACTOR, UPGRADED PERCOLATION PONDS WITH NO SSJID DISCHARGE

Alternative 1A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								$ 990,680
	Civil								
	site grading balanced cut/fill	14080	CY	$ 6	$ 84,480				$ 84,480
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (3)	105600	SF	$ 2	$ 211,200				$ 211,200
	headworks/dewatering shade structure	0	SF	$ 20	$ -				$ -
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	0	lump sum	$ 400,000			$ -		$ -
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	basic SCADA system	1	lump sum	$ 100,000				$ 100,000	$ 100,000
	main PLC	1	lump sum	$ 25,000				$ 25,000	$ 25,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000
B	**EMERGENCY BYPASS AND PUMP BACK**								$ 80,000
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	0	LF	$ 90	$ -				$ -
	Mechanical								
	ESB pumps to headworks installed	0	EA	$ 50,000		$ -			$ -
	8 inch check and plug valve sets installed	0	EA	$ 15,000		$ -			$ -
	mech DI station piping installed	0	lump sum	$ 40,000		$ -			$ -
									$ -
	Electrical								
	2 pump VFDs installed	0	EA	$ 30,000			$ -		$ -
	Instrumentaion and Controls								
	discharge 12 inch FM	0	EA	$ 10,000				$ -	$ -
	ESB pumps controls integration	0	lump sum	$ 40,000				$ -	$ -
C	**HEADWORKS**								$ 1,213,000
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	small odor control installed	1	lump sum	$ 100,000		$ 100,000			$ 100,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								$ 399,572
	Civil								
	site grading balanced cut/fill (8)	64533	CY	$ 3	$ 193,600				$ 193,600
	center hubs concrete	69	CY	$ 950	$ 65,972				$ 65,972
	RPE liners on sidewalls	70000	SF	$ 2	$ 140,000				$ 140,000
	Instrumentation and Controls								
	none								

Alternative 1A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
E	**SECONDARY PROCESS**								**$ 3,280,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	3	EA	$ 150,000		$ 450,000			$ 450,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000
F	**FILTRATION**								**$ -**
	Civil								
	upstream/downstream splitter channels	0	CY	$ 950	$ -				$ -
	2 filter bays	0	CY	$ 950	$ -				$ -
	Mechanical								
	packaged disk filter modules	0	EA	$ 250,000		$ -			$ -
	north and south canal gates installed	0	EA	$ 7,500		$ -			$ -
	polymer injection system	0	lump sum	$ 10,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	0	lump sum	$ 80,000			$ -		$ -
	Instrumentaion and Controls								
	filtration system integration	0	lump sum	$ 25,000				$ -	$ -
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								**$ -**
	Civil								
	SSJID discharge pump station concrete	0	CY	$ 950	$ -				$ -
	16" PVC C905 discharge line to percolation N or S	0	LF	$ 120	$ -				$ -
	pipe 1 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	pipe 2 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	Mechanical								
	chlorine injection tank/skid installed	0	EA	$ 15,000		$ -			$ -
	SSJID discharge pumps/valves installed	0	EA	$ 60,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	0	lump sum	$ 75,000			$ -		$ -
	Instrumentaion and Controls								
	chlorine system and pump station integration	0	lump sum	$ 80,000				$ -	$ -
H	**AERATED SLUDGE HOLDING/THICKENING**								**$ 1,019,500**
	Civil								
	aerated sludge holding steel tank(s)	400000	gal	$ 1.2	$ 480,000				$ 480,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	1	EA	$ 80,000		$ 80,000			$ 80,000
	mixers installed	1	EA	$ 12,000		$ 12,000			$ 12,000
	blowers installed	2	EA	$ 65,000		$ 130,000			$ 130,000
	thickener installed	0	EA	$ 150,000		$ -			$ -
	decanters installed	1	EA	$ 25,000		$ 25,000			$ 25,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 60,000			$ 60,000		$ 60,000
	VFDs installed	3	EA	$ 40,000			$ 120,000		$ 120,000
	Instrumentation and Controls								
	digestion integration	1	lump sum	$ 100,000				$ 100,000	$ 100,000

Alternative 1A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
I	**SLUDGE DEWATERING**								$ 1,180,000
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	0	lump sum	$ 1,000,000		$ -			$ -
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	0	lump sum	$ 75,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								$ 50,000
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 2,918,029	$ 3,397,000	$ 1,235,000	$ 663,000	$ 8,213,029
					36%	41%	15%	8%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								$ 1,642,606
M	**12% DESIGN, PERMIT, CONST MANAGE**								$ 985,563
	SUBTOTAL INCLUDING OVERHEAD								$ 10,841,198
	15% CONTINGENCY								$ 1,626,180
	TOTAL INCLUDING CONTINGENCY								$ 12,500,000

ALTERNATIVE 1B – COMBINED FACILTY WITH ONLY MINIMAL/NECESSARY COMPONENTS, SIZED TO ACCOMMODATE EXISTING LOADS ONLY WITH LOW SAFETY FACTOR, ½ FLOW TREATED FOR SSJID DISCHARGE

Alternative 1B - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								$ 990,680
	Civil								
	site grading balanced cut/fill	14080	CY	$ 6	$ 84,480				$ 84,480
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (3)	105600	SF	$ 2	$ 211,200				$ 211,200
	headworks/dewatering shade structure	0	SF	$ 20	$ -				$ -
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	0	lump sum	$ 400,000			$ -		$ -
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	basic SCADA system	1	lump sum	$ 100,000				$ 100,000	$ 100,000
	main PLC	1	lump sum	$ 25,000				$ 25,000	$ 25,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000
B	**EMERGENCY BYPASS AND PUMP BACK**								$ 80,000
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	0	LF	$ 90	$ -				$ -
	Mechanical								
	ESB pumps to headworks installed	0	EA	$ 50,000		$ -			$ -
	8 inch check and plug valve sets installed	0	EA	$ 15,000		$ -			$ -
	mech DI station piping installed	0	lump sum	$ 40,000		$ -			$ -
									$ -
	Electrical								
	2 pump VFDs installed	0	EA	$ 30,000			$ -		$ -
	Instrumentaion and Controls								
	discharge 12 inch FM	0	EA	$ 10,000				$ -	$ -
	ESB pumps controls integration	0	lump sum	$ 40,000				$ -	$ -

Alternative 1B - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
C	**HEADWORKS**								**$ 1,213,000**
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	small odor control installed	1	lump sum	$ 100,000		$ 100,000			$ 100,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								**$ -**
	Civil								
	site grading balanced cut/fill (8)	0	CY	$ 3	$ -				$ -
	center hubs concrete	0	CY	$ 950	$ -				$ -
	RPE liners on sidewalls	0	SF	$ 2	$ -				$ -
	Instrumentation and Controls								
	none								
E	**SECONDARY PROCESS**								**$ 3,280,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	3	EA	$ 150,000		$ 450,000			$ 450,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000
F	**FILTRATION**								**$ 743,578**
	Civil								
	upstream/downstream splitter channels	56	CY	$ 950	$ 52,778				$ 52,778
	2 filter bays	64	CY	$ 950	$ 60,800				$ 60,800
	Mechanical								
	packaged disk filter modules	2	EA	$ 250,000		$ 500,000			$ 500,000
	north and south canal gates installed	2	EA	$ 7,500		$ 15,000			$ 15,000
	polymer injection system	1	lump sum	$ 10,000		$ 10,000			$ 10,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 80,000			$ 80,000		$ 80,000
	Instrumentaion and Controls								
	filtration system integration	1	lump sum	$ 25,000				$ 25,000	$ 25,000
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								**$ 667,407**
	Civil								
	SSJID discharge pump station concrete	81	CY	$ 950	$ 77,407				$ 77,407
	16" PVC C905 discharge line to percolation N or S	1000	LF	$ 120	$ 120,000				$ 120,000
	pipe 1 - 12" PVC C905 discharge line to SSJID	3000	LF	$ 75	$ 225,000				$ 225,000
	pipe 2 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	Mechanical								
	chlorine injection tank/skid installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	SSJID discharge pumps/valves installed	1	EA	$ 60,000		$ 60,000			$ 60,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	chlorine system and pump station integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000

Alternative 1B - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
H	**AERATED SLUDGE HOLDING/THICKENING**								$ 1,019,500
	Civil								
	aerated sludge holding steel tank(s)	400000	gal	$ 1.2	$ 480,000				$ 480,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	1	EA	$ 80,000		$ 80,000			$ 80,000
	mixers installed	1	EA	$ 12,000		$ 12,000			$ 12,000
	blowers installed	2	EA	$ 65,000		$ 130,000			$ 130,000
	thickener installed	0	EA	$ 150,000		$ -			$ -
	decanters installed	1	EA	$ 25,000		$ 25,000			$ 25,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 60,000			$ 60,000		$ 60,000
	VFDs installed	3	EA	$ 40,000			$ 120,000		$ 120,000
	Instrumentation and Controls								
	digestion integration	1	lump sum	$ 100,000				$ 100,000	$ 100,000
I	**SLUDGE DEWATERING**								$ 1,180,000
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	0	lump sum	$ 1,000,000		$ -			$ -
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	0	lump sum	$ 75,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								$ 50,000
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 3,054,441	$ 4,012,000	$ 1,390,000	$ 768,000	$ 9,224,441
					33%	43%	15%	8%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								$ 1,844,888
M	**12% DESIGN, PERMIT, CONST MANAGE**								$ 1,106,933
	SUBTOTAL INCLUDING OVERHEAD								$ 12,176,263
	15% CONTINGENCY								$ 1,826,439
	TOTAL INCLUDING CONTINGENCY								$ 14,000,000

ALTERNATIVE 2A – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, PLUS PERCOLATION BASIN UPGRADES (NO TREATMENT FOR SSJID CONNECTION)

Alternative 2A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								$ 1,193,680
	Civil								
	site grading balanced cut/fill	14080	CY	$ 6	$ 84,480				$ 84,480
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (3)	105600	SF	$ 2	$ 211,200				$ 211,200
	headworks/dewatering shade structure	6400	SF	$ 20	$ 128,000				$ 128,000
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	0	lump sum	$ 400,000			$ -		$ -
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	SCADA system	1	lump sum	$ 150,000				$ 150,000	$ 150,000
	main PLC	1	lump sum	$ 50,000				$ 50,000	$ 50,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000

Alternative 2A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
B	**EMERGENCY BYPASS AND PUMP BACK**								**$ 405,000**
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	500	LF	$ 90	$ 45,000				$ 45,000
	Mechanical								
	ESB pumps to headworks installed	2	EA	$ 50,000		$ 100,000			$ 100,000
	8 inch check and plug valve sets installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	mech DI station piping installed	1	lump sum	$ 40,000		$ 40,000			$ 40,000
									$ -
	Electrical								
	2 pump VFDs installed	2	EA	$ 30,000			$ 60,000		$ 60,000
	Instrumentaion and Controls								
	discharge 12 inch FM	1	EA	$ 10,000				$ 10,000	$ 10,000
	ESB pumps controls integration	1	lump sum	$ 40,000				$ 40,000	$ 40,000
C	**HEADWORKS**								**$ 1,313,000**
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	odor control installed	1	lump sum	$ 200,000		$ 200,000			$ 200,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								**$ 399,572**
	Civil								
	site grading balanced cut/fill (8)	64533	CY	$ 3	$ 193,600				$ 193,600
	center hubs concrete	69	CY	$ 950	$ 65,972				$ 65,972
	RPE liners on sidewalls	70000	SF	$ 2	$ 140,000				$ 140,000
	Instrumentation and Controls								
	none								
E	**SECONDARY PROCESS**								**$ 3,280,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	3	EA	$ 150,000		$ 450,000			$ 450,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000
F	**FILTRATION**								**$ -**
	Civil								
	upstream/downstream splitter channels	0	CY	$ 950	$ -				$ -
	2 filter bays	0	CY	$ 950	$ -				$ -
	Mechanical								
	packaged disk filter modules	0	EA	$ 250,000		$ -			$ -
	north and south canal gates installed	0	EA	$ 7,500		$ -			$ -
	polymer injection system	0	lump sum	$ 10,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	0	lump sum	$ 80,000			$ -		$ -
	Instrumentaion and Controls								
	filtration system integration	0	lump sum	$ 25,000				$ -	$ -

Alternative 2A - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								**$ -**
	Civil								
	SSJID discharge pump station concrete	0	CY	$ 950	$ -				$ -
	16" PVC C905 discharge line to percolation N or S	0	LF	$ 120	$ -				$ -
	pipe 1 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	pipe 2 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	Mechanical								
	chlorine injection tank/skid installed	0	EA	$ 15,000		$ -			$ -
	SSJID discharge pumps/valves installed	0	EA	$ 60,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	0	lump sum	$ 150,000			$ -		$ -
	Instrumentaion and Controls								
	chlorine system and pump station integration	0	lump sum	$ 100,000				$ -	$ -
H	**AERATED SLUDGE HOLDING/THICKENING**								**$ 1,761,500**
	Civil								
	aerated sludge holding steel tanks	600000	gal	$ 1.2	$ 720,000				$ 720,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	2	EA	$ 80,000		$ 160,000			$ 160,000
	mixers installed	2	EA	$ 12,000		$ 24,000			$ 24,000
	blowers installed	3	EA	$ 65,000		$ 195,000			$ 195,000
	thickener installed	1	EA	$ 150,000		$ 150,000			$ 150,000
	decanters installed	2	EA	$ 25,000		$ 50,000			$ 50,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 100,000			$ 100,000		$ 100,000
	VFDs installed	5	EA	$ 40,000			$ 200,000		$ 200,000
	Instrumentation and Controls								
	thickening and digestion integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
I	**SLUDGE DEWATERING**								**$ 1,180,000**
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	0	lump sum	$ 1,000,000		$ -			$ -
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	0	lump sum	$ 75,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								**$ 50,000**
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 3,331,029	$ 3,999,000	$ 1,415,000	$ 838,000	**$ 9,583,029**
					35%	42%	15%	9%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								**$ 1,916,606**
M	**12% DESIGN, PERMIT, CONST MANAGE**								**$ 1,149,963**
	SUBTOTAL INCLUDING OVERHEAD								**$ 12,649,598**
	15% CONTINGENCY								**$ 1,897,440**
	TOTAL INCLUDING CONTINGENCY								**$ 14,500,000**

ALTERNATIVE 2B – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, ½ FLOW TREATED FOR SSJID DISCHARGE

Alternative 2B - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								**$ 1,193,680**
	Civil								
	site grading balanced cut/fill	14080	CY	$ 6	$ 84,480				$ 84,480
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (3)	105600	SF	$ 2	$ 211,200				$ 211,200
	headworks/dewatering shade structure	6400	SF	$ 20	$ 128,000				$ 128,000
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	0	lump sum	$ 400,000			$ -		$ -
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	SCADA system	1	lump sum	$ 150,000				$ 150,000	$ 150,000
	main PLC	1	lump sum	$ 50,000				$ 50,000	$ 50,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000
B	**EMERGENCY BYPASS AND PUMP BACK**								**$ 405,000**
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	500	LF	$ 90	$ 45,000				$ 45,000
	Mechanical								
	ESB pumps to headworks installed	2	EA	$ 50,000		$ 100,000			$ 100,000
	8 inch check and plug valve sets installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	mech DI station piping installed	1	lump sum	$ 40,000		$ 40,000			$ 40,000
									$ -
	Electrical								
	2 pump VFDs installed	2	EA	$ 30,000			$ 60,000		$ 60,000
	Instrumentaion and Controls								
	discharge 12 inch FM	1	EA	$ 10,000				$ 10,000	$ 10,000
	ESB pumps controls integration	1	lump sum	$ 40,000				$ 40,000	$ 40,000
C	**HEADWORKS**								**$ 1,313,000**
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	odor control installed	1	lump sum	$ 200,000		$ 200,000			$ 200,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								**$ -**
	Civil								
	site grading balanced cut/fill (8)	0	CY	$ 3	$ -				$ -
	center hubs concrete	0	CY	$ 950	$ -				$ -
	RPE liners on sidewalls	0	SF	$ 2	$ -				$ -
	Instrumentation and Controls								
	none								
E	**SECONDARY PROCESS**								**$ 3,280,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	3	EA	$ 150,000		$ 450,000			$ 450,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000

Alternative 2B - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
F	**FILTRATION**								$ 743,578
	Civil								
	upstream/downstream splitter channels	56	CY	$ 950	$ 52,778				$ 52,778
	2 filter bays	64	CY	$ 950	$ 60,800				$ 60,800
	Mechanical								
	packaged disk filter modules	2	EA	$ 250,000		$ 500,000			$ 500,000
	north and south canal gates installed	2	EA	$ 7,500		$ 15,000			$ 15,000
	polymer injection system	1	lump sum	$ 10,000		$ 10,000			$ 10,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 80,000			$ 80,000		$ 80,000
	Instrumentaion and Controls								
	filtration system integration	1	lump sum	$ 25,000				$ 25,000	$ 25,000
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								$ 822,407
	Civil								
	SSJID discharge pump station concrete	81	CY	$ 950	$ 77,407				$ 77,407
	16" PVC C905 discharge line to percolation N or S	1000	LF	$ 120	$ 120,000				$ 120,000
	pipe 1 - 12" PVC C905 discharge line to SSJID	3000	LF	$ 75	$ 225,000				$ 225,000
	pipe 2 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	Mechanical								
	chlorine injection tank/skid installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	SSJID discharge pumps/valves installed	2	EA	$ 60,000		$ 120,000			$ 120,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	Instrumentaion and Controls								
	chlorine system and pump station integration	1	lump sum	$ 100,000				$ 100,000	$ 100,000
H	**AERATED SLUDGE HOLDING/THICKENING**								$ 1,761,500
	Civil								
	aerated sludge holding steel tanks	600000	gal	$ 1.2	$ 720,000				$ 720,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	2	EA	$ 80,000		$ 160,000			$ 160,000
	mixers installed	2	EA	$ 12,000		$ 24,000			$ 24,000
	blowers installed	3	EA	$ 65,000		$ 195,000			$ 195,000
	thickener installed	1	EA	$ 150,000		$ 150,000			$ 150,000
	decanters installed	2	EA	$ 25,000		$ 50,000			$ 50,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 100,000			$ 100,000		$ 100,000
	VFDs installed	5	EA	$ 40,000			$ 200,000		$ 200,000
	Instrumentation and Controls								
	thickening and digestion integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
I	**SLUDGE DEWATERING**								$ 1,180,000
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	0	lump sum	$ 1,000,000		$ -			$ -
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	0	lump sum	$ 75,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								$ 50,000
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 3,467,441	$ 4,674,000	$ 1,645,000	$ 963,000	$ 10,749,441
					32%	43%	15%	9%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								$ 2,149,888
M	**12% DESIGN, PERMIT, CONST MANAGE**								$ 1,289,933
	SUBTOTAL INCLUDING OVERHEAD								$ 14,189,263
	15% CONTINGENCY								$ 2,128,389
	TOTAL INCLUDING CONTINGENCY								$ 16,300,000

ALTERNATIVE 2C – NEW COMBINED FACILTY SIZED TO ACCOMMODATE EXISTING LOADS WITH FACTOR OF SAFETY, ½ FLOW TREATED FOR SSJID DISCHARGE, PLUS PERCOLATION BASIN UPGRADES

Alternative 2C - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								**$ 1,193,680**
	Civil								
	site grading balanced cut/fill	14080	CY	$ 6	$ 84,480				$ 84,480
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (3)	105600	SF	$ 2	$ 211,200				$ 211,200
	headworks/dewatering shade structure	6400	SF	$ 20	$ 128,000				$ 128,000
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	0	lump sum	$ 400,000			$ -		$ -
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	SCADA system	1	lump sum	$ 150,000				$ 150,000	$ 150,000
	main PLC	1	lump sum	$ 50,000				$ 50,000	$ 50,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000
B	**EMERGENCY BYPASS AND PUMP BACK**								**$ 405,000**
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	500	LF	$ 90	$ 45,000				$ 45,000
	Mechanical								
	ESB pumps to headworks installed	2	EA	$ 50,000		$ 100,000			$ 100,000
	8 inch check and plug valve sets installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	mech DI station piping installed	1	lump sum	$ 40,000		$ 40,000			$ 40,000
									$ -
	Electrical								
	2 pump VFDs installed	2	EA	$ 30,000			$ 60,000		$ 60,000
	Instrumentaion and Controls								
	discharge 12 inch FM	1	EA	$ 10,000				$ 10,000	$ 10,000
	ESB pumps controls integration	1	lump sum	$ 40,000				$ 40,000	$ 40,000
C	**HEADWORKS**								**$ 1,313,000**
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	odor control installed	1	lump sum	$ 200,000		$ 200,000			$ 200,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								**$ 399,572**
	Civil								
	site grading balanced cut/fill (8)	64533	CY	$ 3	$ 193,600				$ 193,600
	center hubs concrete	69	CY	$ 950	$ 65,972				$ 65,972
	RPE liners on sidewalls	70000	SF	$ 2	$ 140,000				$ 140,000
	Instrumentation and Controls								
	none								
E	**SECONDARY PROCESS**								**$ 3,280,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	3	EA	$ 150,000		$ 450,000			$ 450,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000

Alternative 2C - Prelim 10% Capital Cost Budget for 2.6 – 3.0 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
F	**FILTRATION**								$ 743,578
	Civil								
	upstream/downstream splitter channels	56	CY	$ 950	$ 52,778				$ 52,778
	2 filter bays	64	CY	$ 950	$ 60,800				$ 60,800
	Mechanical								
	packaged disk filter modules	2	EA	$ 250,000		$ 500,000			$ 500,000
	north and south canal gates installed	2	EA	$ 7,500		$ 15,000			$ 15,000
	polymer injection system	1	lump sum	$ 10,000		$ 10,000			$ 10,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 80,000			$ 80,000		$ 80,000
	Instrumentaion and Controls								
	filtration system integration	1	lump sum	$ 25,000				$ 25,000	$ 25,000
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								$ 822,407
	Civil								
	SSJID discharge pump station concrete	81	CY	$ 950	$ 77,407				$ 77,407
	16" PVC C905 discharge line to percolation N or S	1000	LF	$ 120	$ 120,000				$ 120,000
	pipe 1 - 12" PVC C905 discharge line to SSJID	3000	LF	$ 75	$ 225,000				$ 225,000
	pipe 2 - 12" PVC C905 discharge line to SSJID	0	LF	$ 75	$ -				$ -
	Mechanical								
	chlorine injection tank/skid installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	SSJID discharge pumps/valves installed	2	EA	$ 60,000		$ 120,000			$ 120,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	Instrumentaion and Controls								
	chlorine system and pump station integration	1	lump sum	$ 100,000				$ 100,000	$ 100,000
H	**AERATED SLUDGE HOLDING/THICKENING**								$ 1,761,500
	Civil								
	aerated sludge holding steel tanks	600000	gal	$ 1.2	$ 720,000				$ 720,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	2	EA	$ 80,000		$ 160,000			$ 160,000
	mixers installed	2	EA	$ 12,000		$ 24,000			$ 24,000
	blowers installed	3	EA	$ 65,000		$ 195,000			$ 195,000
	thickener installed	1	EA	$ 150,000		$ 150,000			$ 150,000
	decanters installed	2	EA	$ 25,000		$ 50,000			$ 50,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 100,000			$ 100,000		$ 100,000
	VFDs installed	5	EA	$ 40,000			$ 200,000		$ 200,000
	Instrumentation and Controls								
	thickening and digestion integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
I	**SLUDGE DEWATERING**								$ 1,180,000
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	0	lump sum	$ 1,000,000		$ -			$ -
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	0	lump sum	$ 75,000		$ -			$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								$ 50,000
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 3,867,014	$ 4,674,000	$ 1,645,000	$ 963,000	$ 11,149,014
					35%	42%	15%	9%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								$ 2,229,803
M	**12% DESIGN, PERMIT, CONST MANAGE**								$ 1,337,882
	SUBTOTAL INCLUDING OVERHEAD								$ 14,716,698
	15% CONTINGENCY								$ 2,207,505
	TOTAL INCLUDING CONTINGENCY								$ 16,900,000

ALTERNATIVE 3 – IDEAL NEW COMBINED FACILTY WITH 100% TREATMENT FOR SSJID, SLUDGE DRYING, SIZED TO ACCOMMODATE UP TO 25% EXTRA CAPACITY, FULL PERCOLATION BASIN GRADING AND LINING

Alternative 3 - Prelim 10% Capital Cost Budget for 2.6 – 3.1 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
A	**GENERAL SITE CONSTRUCTION**								**$ 2,204,240**
	Civil								
	site grading balanced cut/fill (4)	18773	CY	$ 6	$ 112,640				$ 112,640
	AC pavement	10000	SF	$ 5	$ 50,000				$ 50,000
	RPE liners in secondary basins (4)	140800	SF	$ 2	$ 281,600				$ 281,600
	headworks/dewatering shade building	6400	SF	$ 100	$ 640,000				$ 640,000
	aeration equipment bldg	800	SF	$ 150	$ 120,000				$ 120,000
	dewatering	0	wells	$ 12,000	$ -				$ -
	lighting	1	lump sum	$ 30,000	$ 30,000				$ 30,000
	Electrical								
	main service entrance (exist. SES-A mods)	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	new generator and ATS	1	lump sum	$ 400,000			$ 400,000		$ 400,000
	new main field feeders	1200	LF	$ 150			$ 180,000		$ 180,000
	Instrumentaion and Controls								$ -
	SCADA system	1	lump sum	$ 150,000				$ 150,000	$ 150,000
	main PLC	1	lump sum	$ 50,000				$ 50,000	$ 50,000
	computer hardware/software	1	lump sum	$ 15,000				$ 15,000	$ 15,000
	new fiber optic network	1000	LF	$ 25				$ 25,000	$ 25,000
B	**EMERGENCY BYPASS AND PUMP BACK**								**$ 405,000**
	Civil								
	headworks and secondary overflow weirs	2	EA	$ 10,000	$ 20,000				$ 20,000
	18" PVC C905 bypass pipe	500	LF	$ 120	$ 60,000				$ 60,000
	12" PVC C905 return pipe	500	LF	$ 90	$ 45,000				$ 45,000
	Mechanical								
	ESB pumps to headworks installed	2	EA	$ 50,000		$ 100,000			$ 100,000
	8 inch check and plug valve sets installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	mech DI station piping installed	1	lump sum	$ 40,000		$ 40,000			$ 40,000
									$ -
	Electrical								
	2 pump VFDs installed	2	EA	$ 30,000			$ 60,000		$ 60,000
	Instrumentaion and Controls								
	discharge 12 inch FM	1	EA	$ 10,000				$ 10,000	$ 10,000
	ESB pumps controls integration	1	lump sum	$ 40,000				$ 40,000	$ 40,000
C	**HEADWORKS**								**$ 1,313,000**
	Civil								
	included in A		SF		$ -				$ -
									$ -
	Mechanical								
	headworks units installed	2	lump sum	$ 500,000		$ 1,000,000			$ 1,000,000
	odor control installed	1	lump sum	$ 200,000		$ 200,000			$ 200,000
	booster pump skid installed	1	lump sum	$ 8,000		$ 8,000			$ 8,000
									$ -
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 75,000			$ 75,000		$ 75,000
	Instrumentaion and Controls								
	headworks controls integration	1	lump sum	$ 30,000				$ 30,000	$ 30,000
D	**PERCOLATION BASINS**								**$ 399,572**
	Civil								
	site grading balanced cut/fill (8)	64533	CY	$ 3	$ 193,600				$ 193,600
	center hubs concrete	69	CY	$ 950	$ 65,972				$ 65,972
	RPE liners on sidewalls	70000	SF	$ 2	$ 140,000				$ 140,000
	Instrumentation and Controls								
	none								
E	**SECONDARY PROCESS**								**$ 3,430,276**
	Civil								
	north splitter box concrete	94	CY	$ 950	$ 89,722				$ 89,722
	south RAS/WAS/scum pump station	193	CY	$ 950	$ 182,963				$ 182,963
	2 x 80 foot clarifiers	1061	CY	$ 950	$ 1,007,591				$ 1,007,591
	influent, RAS, clarifier piping	800	LF	$ 150	$ 120,000				$ 120,000
	Mechanical								
	aeration blowers installed	4	EA	$ 150,000		$ 600,000			$ 600,000
	BIG oxygen skid system installed	1	EA	$ 250,000		$ 250,000			$ 250,000
	aeration and oxygen piping/hosing	6000	LF	$ 50		$ 300,000			$ 300,000
	north and south weir gates installed	6	EA	$ 12,000		$ 72,000			$ 72,000
	RAS/WAS/scum pumps/valves installed	7	EA	$ 20,000		$ 140,000			$ 140,000
	piping, grating, ladders, catwalks, installed	1	lump sum	$ 150,000		$ 150,000			$ 150,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	VFDs, disconnects, & power distribution	1	lump sum	$ 180,000			$ 180,000		$ 180,000
	Instrumentaion and Controls								
	flowmeters installed	6	lump sum	$ 8,000				$ 48,000	$ 48,000
	water quality instruments installed	12	lump sum	$ 7,500				$ 90,000	$ 90,000
	secondary controls integration	1	lump sum	$ 80,000				$ 80,000	$ 80,000

Alternative 3 - Prelim 10% Capital Cost Budget for 2.6 – 3.1 MGD Combined Facility

Item #	Item Description	QT	Units	Unit Rate	Civil	Mechanical	Electrical	Controls	COST
F	**FILTRATION**								**$ 1,412,156**
	Civil								
	upstream/downstream splitter channels	111	CY	$ 950	$ 105,556				$ 105,556
	4 filter bays	128	CY	$ 950	$ 121,600				$ 121,600
	Mechanical								
	packaged disk filter modules	4	EA	$ 250,000		$ 1,000,000			$ 1,000,000
	north and south canal gates installed	4	EA	$ 7,500		$ 30,000			$ 30,000
	polymer injection system	1	lump sum	$ 10,000		$ 10,000			$ 10,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 120,000			$ 120,000		$ 120,000
	Instrumentaion and Controls								
	filtration system integration	1	lump sum	$ 25,000				$ 25,000	$ 25,000
G	**DISINFECTION & DISCHARGE TO SSJID/PERC**								**$ 1,047,407**
	Civil								
	SSJID discharge pump station concrete	81	CY	$ 950	$ 77,407				$ 77,407
	16" PVC C905 discharge line to percolation N or S	1000	LF	$ 120	$ 120,000				$ 120,000
	pipe 1 - 12" PVC C905 discharge line to SSJID	3000	LF	$ 75	$ 225,000				$ 225,000
	pipe 2 - 12" PVC C905 discharge line to SSJID	3000	LF	$ 75	$ 225,000				$ 225,000
	Mechanical								
	chlorine injection tank/skid installed	2	EA	$ 15,000		$ 30,000			$ 30,000
	SSJID discharge pumps/valves installed	2	EA	$ 60,000		$ 120,000			$ 120,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 150,000			$ 150,000		$ 150,000
	Instrumentaion and Controls								
	chlorine system and pump station integration	1	lump sum	$ 100,000				$ 100,000	$ 100,000
H	**AERATED SLUDGE HOLDING/THICKENING**								**$ 1,761,500**
	Civil								
	aerated sludge holding steel tanks	600000	gal	$ 1.2	$ 720,000				$ 720,000
	WAS piping and valves	500	LF	$ 25	$ 12,500				$ 12,500
	Mechanical								
	diffusers installed	2	EA	$ 80,000		$ 160,000			$ 160,000
	mixers installed	2	EA	$ 12,000		$ 24,000			$ 24,000
	blowers installed	3	EA	$ 65,000		$ 195,000			$ 195,000
	thickener installed	1	EA	$ 150,000		$ 150,000			$ 150,000
	decanters installed	2	EA	$ 25,000		$ 50,000			$ 50,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 100,000			$ 100,000		$ 100,000
	VFDs installed	5	EA	$ 40,000			$ 200,000		$ 200,000
	Instrumentation and Controls								
	thickening and digestion integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
I	**SLUDGE DEWATERING**								**$ 2,255,000**
	Mechanical								
	screw presses and associated installed	2	lump sum	$ 300,000		$ 600,000			$ 600,000
	fluidized dryer installed	1	lump sum	$ 1,000,000		$ 1,000,000			$ 1,000,000
	sludge feed pumps installed	2	EA	$ 40,000		$ 80,000			$ 80,000
	dewatering building bridge crane	1	lump sum	$ 75,000		$ 75,000			$ 75,000
	Electrical								
	conduit, wire, jbox and disconnect installed	1	lump sum	$ 175,000			$ 175,000		$ 175,000
	VFDs and power distribution	1	lump sum	$ 125,000			$ 125,000		$ 125,000
	misc. mechanical	1	lump sum	$ 50,000			$ 50,000		$ 50,000
									$ -
	Instrumentaion and Controls								
	dewatering integration	1	lump sum	$ 150,000				$ 150,000	$ 150,000
J	**DEMO/SALVAGE**								**$ 50,000**
	Civil								
	demolish/salvage unused tanks/equip	1	lump sum	$ 50,000	$ 50,000				$ 50,000
K	**SUBTOTAL A-J**				$ 4,816,151	$ 6,414,000	$ 2,085,000	$ 963,000	**$ 14,278,151**
					34%	45%	15%	7%	
L	**20% OVERHEAD, TAXES, BONDING, INSURANCE**								**$ 2,855,630**
M	**12% DESIGN, PERMIT, CONST MANAGE**								**$ 1,713,378**
	SUBTOTAL INCLUDING OVERHEAD								**$ 18,847,160**
	15% CONTINGENCY								**$ 2,827,074**
	TOTAL INCLUDING CONTINGENCY								**$ 21,700,000**

APPENDIX B

Regulatory and SSJID Correspondence

From: Andy Komor
Sent: Monday, August 5, 2019 5:35 PM
To: Matthew Mills
Subject: FW: Escalon/SSJID call or mtg to discuss water supply

Pls save in appendix report.

Andy Komor, MS, PE
Vice President, Environmental Water Division
D (714) 481-7225 | C (714) 514-8919
vcard | email | website

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From: Andy Komor
Sent: Monday, August 5, 2019 5:34 PM
To: Forrest Killingsworth <fkillingsworth@ssjid.com>
Cc: Dawn Driesen <DDriesen@ssjid.com>; Tammy Alcantor <TAlcantor@cityofescalon.org>; Juston Collins <Jcollins@cityofescalon.org>; Robert R. Murphy <rmurphy@pacewater.com>
Subject: RE: Escalon/SSJID call or mtg to discuss water supply

Forrest, good morning, I believe maybe you sent along a follow-up to our call together from a couple weeks ago, I can't locate it in my inbox.

I was hoping to confirm in writing the following:

1. PACE and the City of Escalon are working on improvement plans to improve the treatment of the wastewater plant including Industrial and Domestic Improvements, with the intent to provide low organic, low turbidity, pathogen free water.
2. Assuming the facility is upgraded to produce the quality described in #1, we understand SSJID has an adjacent non-potable canal which may accept "tertiary" water from June-Nov. from either the industrial effluent, domestic effluent, or a combined effluent, conditional on meeting the requirements of Title 22 for oxidized, filtered, and disinfected water.
3. We intend to present the proposed modifications and discuss a potential memo of understanding later this year with project stakeholders.

Thanks!

Andy

Andy Komor, MS, PE
Vice President, Environmental Water Division
D (714) 481-7225 | C (714) 514-8919
vcard | email | website

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From: Forrest Killingsworth <fkillingsworth@ssjid.com>
Sent: Wednesday, July 17, 2019 3:20 PM
To: Andy Komor <akomor@pacewater.com>
Cc: Dawn Driesen <DDriesen@ssjid.com>
Subject: RE: Escalon/SSJID call or mtg to discuss water supply

Andy,

Just a heads up. Your original email got caught up in our spam filter. Please make sure you get a response from me after you send your next email to ensure the same thing doesn't happen.

Thanks,

Forrest Killingsworth, P.E.
Engineering Department Manager
South San Joaquin Irrigation District
(209) 249-4620 Direct
(209) 249-4682 Direct Fax
(209) 623-8491 Mobile

Note: I'll be out of the office without cell phone service Thursday July 18th through Sunday July 21nd, returning Monday.

From: Dawn Driesen <DDriesen@ssjid.com>
Sent: Wednesday, July 17, 2019 7:57 AM
To: Forrest Killingsworth <fkillingsworth@ssjid.com>
Subject: FW: Escalon/SSJID call or mtg to discuss water supply

---

From: Andy Komor <akomor@pacewater.com>
Sent: Tuesday, July 16, 2019 1:57 PM
To: Dawn Driesen <DDriesen@ssjid.com>
Subject: FW: Escalon/SSJID call or mtg to discuss water supply

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From: Andy Komor
Sent: Friday, July 12, 2019 11:55 AM
To: fkillingsworth@ssjid.com
Cc: Tammy Alcantor <TAlcantor@cityofescalon.org>; Juston Collins <Jcollins@cityofescalon.org>; Robert R. Murphy <rmurphy@pacewater.com>
Subject: Escalon/SSJID call or mtg to discuss water supply

Forrest, good afternoon, my name is Andy Komor, the water engineering consultant for the City of Escalon. I have recently worked with SSJID on a new turnout, tank and pump station in the City of Lathrop, with Ed Erisman and others.

I was hoping to see if you were available for call and if needed an in-person meeting to discuss some potential opportunities to partner on local water supply. You are probably aware the City's WWTP includes two separate processes: industrial treated effluent July-December and domestic treated effluent year-long. We were interested in discussing SSJID's interest in receiving existing effluents or potential improved tertiary treated recycled water to your existing irrigation canals/ditches. We would like to understand your downstream use of irrigation canal water as non-potable demand only? We are also in the process of discussing WWTP improvement concepts with the RWQCB, and eventually we could discuss the permitting approval of these water supplies for SSJID demands if it becomes relevant.

I look forward to speaking over the phone or meeting you during a good time for you.

Talk soon!

Andy

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Stacy McCamey

From: Andy Komor
Sent: Friday, July 12, 2019 2:49 PM
To: Kenny, Brendan@Waterboards; Armstrong, Scott@Waterboards
Cc: Hold, Howard@Waterboards; Tammy Alcantor; Juston Collins; Robert R. Murphy
Subject: RE: Escalon WWTP Update and Solutions Call/Mtg

Scott, thanks for your time and answering my questions and providing feedback. We will proceed with our preliminary concepts and diagrams for a presentation to you in the next few weeks.

Brendan, as a followup, I wanted to circle back because it appears we need to request from you combining the percolation ponds now, industrial or domestic in any or all of the existing ponds, we would need a modification/variance. How can we formally request that?

Howard, I look forward to meeting you also, we worked together on the Chumash WWTP low-chlorine disinfection re-permit with Jeff Hodge.

Talk soon.

Andy

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From: Kenny, Brendan@Waterboards <Brendan.Kenny@waterboards.ca.gov>
Sent: Friday, July 12, 2019 2:05 PM
To: Armstrong, Scott@Waterboards <Scott.Armstrong@waterboards.ca.gov>
Cc: Andy Komor <akomor@pacewater.com>; Hold, Howard@Waterboards <Howard.Hold@waterboards.ca.gov>; Kenny, Brendan@Waterboards <Brendan.Kenny@waterboards.ca.gov>
Subject: FW: Escalon WWTP Update and Solutions Call/Mtg

Scott, Andy Komor will be calling you to discuss permitting options for Escalon. There current permit is a 2000 or 2001.

Brendan

From: Andy Komor <akomor@pacewater.com>
Sent: Friday, July 12, 2019 12:30 PM
To: Kenny, Brendan@Waterboards <Brendan.Kenny@waterboards.ca.gov>
Cc: Tammy Alcantor <TAlcantor@cityofescalon.org>; Juston Collins <Jcollins@cityofescalon.org>; Robert R. Murphy <rmurphy@pacewater.com>
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Good afternoon Brendan, my name is Andy Komor, the water engineering consultant for the City of Escalon, 30 mi north of Modesto. I was hoping to see if you were available for call and if needed an in-person meeting to discuss the City's

WWTP permit, current operation, potential improvement ideas, and specific questions about combining elements of the industrial and domestic operation.

Specifically here are some current challenges and ideas for operational improvement we would like to explore:

Challenges:

1. Domestic percolation basins are clogged and unable to be ripped and cleaned or rested
2. Industrial percolation basins area is unsized and inconsistent in percolation
3. Industrial wastewater influent is highly variable including variable and high organic load and large potentially toxic pH
4. The current process is inefficient at solids removal and requires dredging for solids removal, which requires taking portions of the treatment process offline for drying and dredging

Ideas for Improvement:

A. Re-permitting the entire percolation basins' facilities into one combined discharge/facility, with engineered improvements to allow for drying, ripping, and scarifying to more quickly recover capacity during clogging
B. Explore the opportunity to discharge industrial effluent, or possibly tertiary treated domestic, or possibly combined tertiary treated water into nearby agricultural ditches for indirect non-potable reuse, in an effort to reduce the flow to the percolation basins
C. Explore the opportunity to combine influents (industrial and domestic) to stabilize the secondary biological processes with regard to organic load, pH, and other parameters, and improve the operational efficiency of a single treatment plant versus two treatment plants including sampling/monitoring; would like to understand:
    a. Biosolids testing requirements and application for land disposal
    b. Discharge of treated secondary water to existing percolation basins (see Improvement A above)

Thank you for attention, I look forward to speaking over the phone or meeting you during a good time for you.

Talk soon!

Andy

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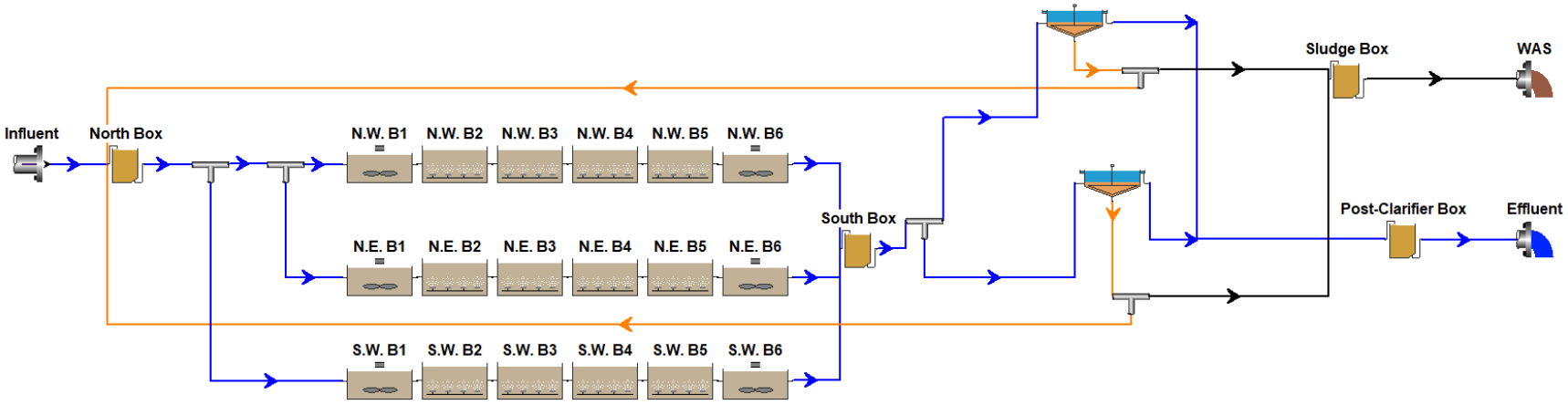
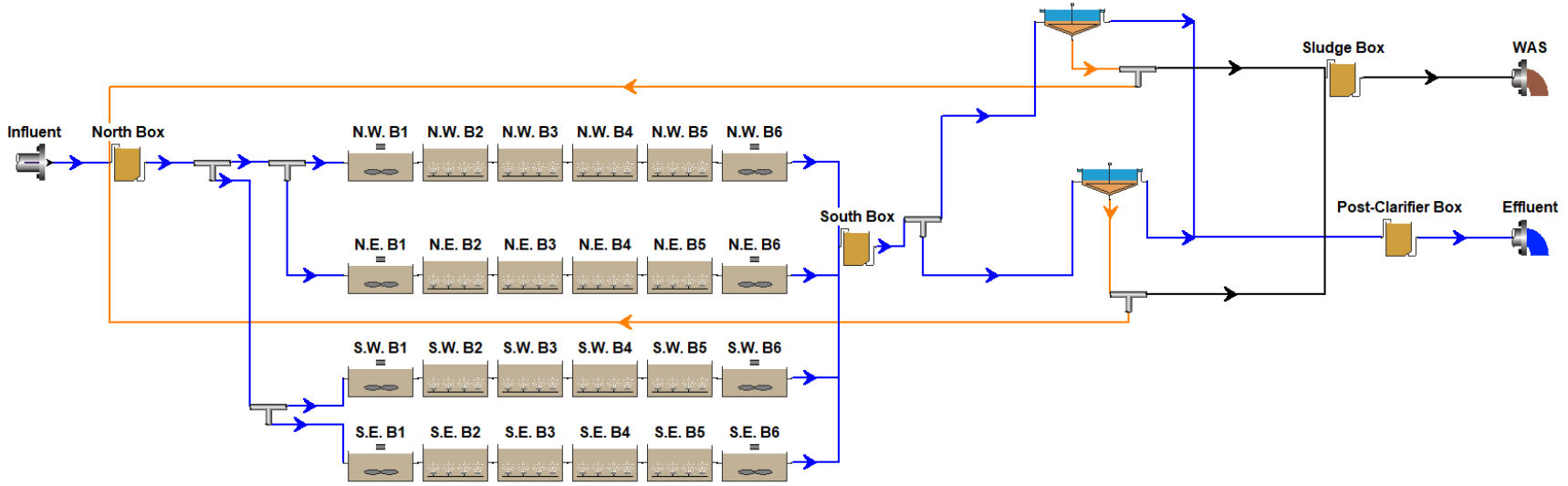
APPENDIX C

BioWin Model Files

B469 - 2.6 & 3.0 MGD Flowsheet - (2019-11-06)



B469 - 3.4 MGD Flowsheet - (2019-11-06)



B469 - Escalon					Modeling Data (2019-11-06)
Influent	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Temperature	°C	20	20	20	-
Total COD	mgCOD/L	2475	2475	2475	***0.6 mgBOD/mgCOD***
Total BOD	mgBOD/L	1423	1423	1423	-
TSS	mg/L	379	379	379	-
VSS	mg/L	289	289	289	***0.7 mgVSS/mgTSS***
TKN	mgN/L	50	50	50	-
Ammonia	mg/L	26.4	26.4	26.4	***0.528 gNH3/gTKN***
Nitrate N	mgN/L	0.3	0.3	0.3	-
Total Phosphorus	mgP/L	16	16	16	***Phosphorus addition required***
pH	unitless	7.3	7.3	7.3	***Default BioWin value***
Alkalinity	mg/L	300	300	300	***Default BioWin value***
Calcium mg/L	mg/L	80	80	80	***Default BioWin value***
Magnesium	mg/L	15	15	15	***Default BioWin value***
Secondary Basins	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Number of Basins	quantity	3	3	4	-
Basin Side Water Depth	feet	16	16	16	-
Total Anoxic Volume (per basin)	MG	0.29	0.29	0.29	-
Total Aeration Volume (per basin)	MG	2.60	2.60	2.60	-
Total Volume (per basin)	MG	2.89	2.89	2.89	-
HRT	hours	80	69.3	79.2	-
SRT	days	17	16.6	16.5	-
MLSS	mg/L	3591	4056	3526	***< 4,500 mg/L***
Process Flows	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
RAS Flow	x Qin	0.4 Q	0.367 Q	0.343 Q	-
	MGD	1.04	1.1	1.2	-
WAS Flow	% Qin	6.54	5.33	6.0	-
	MGD	0.17	0.16	0.21	-
Aeration	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Total Aeration Required (per basin)	cfm	4426	5147	4430	-
Total Diffusers (per basin)	qty	480	480	480	-
Alpha F	constant	0.55	0.55	0.55	-
Beta	constant	0.95	0.95	0.95	-
Diffuser Surface Area	ft^2	3.03	3.03	3.03	-
Diffuser Mounting Height	feet	3	3	3	-
Aeration Schedule	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
(Anoxic) B1 DO Set Point	mg/L	0.0	0.0	0.0	***Unaerated***
(Aeration) B2 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B3 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B4 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Aeration) B5 DO Set Point	mg/L	3.0	3.0	3.0	***24/7 Aeration***
(Anoxic) B6 DO Set Point	mg/L	0.0	0.0	0.0	***Unaerated***
Clarifier	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Number of Clarifiers	quantity	2	2	2	-
Surface Area (80Ø)	ft^2	5026	5026	5026	-
Side Wall Depth	feet	16	16	16	-
Surface Overflow Rate	gal/(ft^2 d)	242	283	327	***< 1000***
Solids Loading Rate	lb/(ft^2 d)	10.85	13.81	13.76	***< 35***
Solids	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Sludge Concentration	mg/L	10791	13172	11730	***< 30000***
Sludge Produced	lb/d	15299	17577	20544	-
Yield Check	ratio	0.38	0.44	0.51	***0.8***
Effluent	**Units**	**2.6 MGD**	**3.0 MGD**	**3.5 MGD**	***Objective/Note***
Flow	MGD	2.43	2.84	3.29	-
COD	mgCOD/L	41.7	53.19	51.72	-
BOD	mgBOD/L	5.09	12.83	12.79	***< 30***
TSS	mg/L	10.76	11.71	10.07	***< 30***
Ammonia (NH3)	mgN/L	0.5	0.31	0.32	***< 0.5***
Nitrate	mgN/L	0	0	0.0	***< 10***
Nitrite	mgN/L	0	0	0.0	***< 1.0***
Total Nitrogen	mgN/L	2.31	2.18	2.08	***< 10***
Total Phosphorus	mgP/L	0.94	0.93	0.90	***< 1.0***
pH	unitless	7.02	6.96	6.97	***6.5 to 8.5***
Alkalinity	mmol/L	4.18	4.22	4.22	-
Alkalinity	mg/L	209	211	211	-

APPENDIX D

Bluein Green Proposal

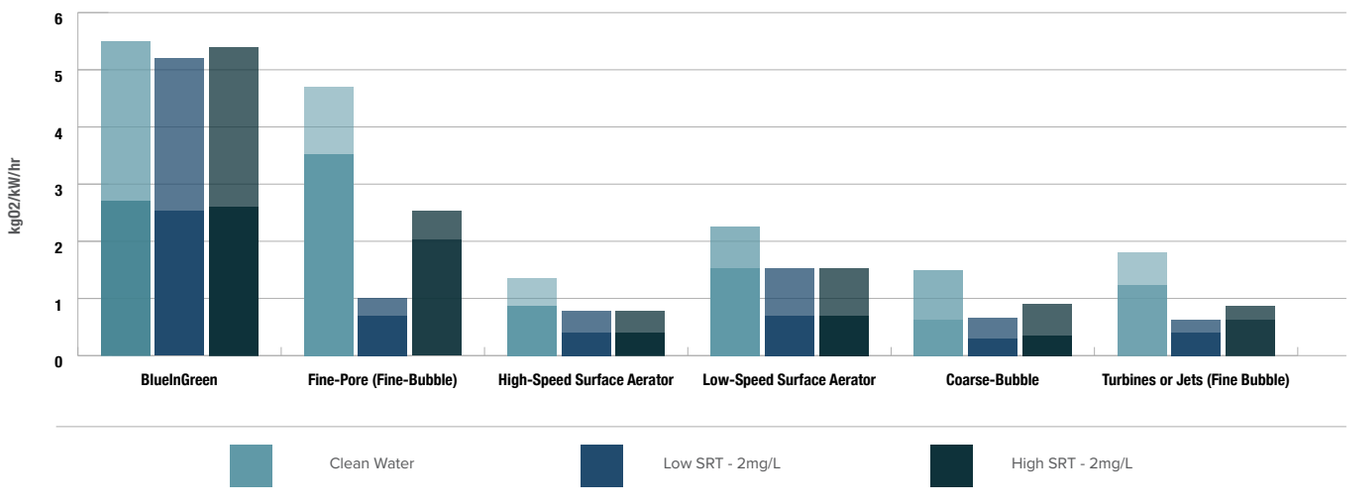
BlueInGreen
solutions for water quality

AERATION COMPARISON

The BIG Difference

The more efficient your aeration system is, the more money you save. Luckily, BlueInGreen solutions are capable of delivering consistently high transfer rates despite initial DO concentrations, depth and solid concentrations, making it an ideal choice for post-aeration, MBRs, aerobic digesters, as well as conventional activated sludge processes. Just take a look at how our solutions stack up against traditional aeration technologies.

Efficiences of Conventional Aeration Equipment vs. BlueInGreen Solutions



Results

Technology	Clean Water	2mg/L Low SRT	2mg/L High SRT
BlueInGreen	2.7-5.5 kgO2/kW/hr	2.5-5.2 kgO2/kW/hr	2.6-5.4 kgO2/kW/hr
Fine-Pore (Fine-Bubble)	3.6-4.8 kgO2/kW/hr	0.7-1.0 kgO2/kW/hr	2.0-2.6 kgO2/kW/hr
High-Speed Surface Aerator	0.9 -1.3 kgO2/kW/hr	0.4-0.8 kgO2/kW/hr	0.4-0.8 kgO2/kW/hr
Low-Speed Surface Aerator	1.5-2.1 kgO2/kW/hr	0.7-1.5 kgO2/kW/hr	0.7-1.5 kgO2/kW/hr
Coarse-Bubble	0.6-1.5 kgO2/kW/hr	0.3-0.7 kgO2/kW/hr	0.4-0.9 kgO2/kW/hr
Turbines or Jets (Fine-Bubble)	1.2-1.8 kgO2/kW/hr	0.4-0.6 kgO2/kW/hr	0.6-0.8 kgO2/kW/hr

Source Stenstrom & Rosso, 2010 | *University of California*

Awards

2015 GCCA Grand Prize Winner

2010 WEF Innovative Technology Award

Notes

1 BlueInGreen pre-dissolves oxygen in sidestream, therefore efficiency is unaffected by DO, depth, solids concentrations, etc.

2 Calculations for conventional aeration equipment must be modified as DO levels increase above 2-mg/L, resulting in even lower efficiencies

Applications

- **Biological Treatment**
- **Effluent Reaeration**
- **Environmental Remediation**
- **Advanced Aquaculture**

CONTACT US

304.TALK.BIG

blueingreen.com

info@blueingreen.com

BlueInGreen
solutions for water quality

ADAPTABLE AERATION

WHAT WE DO

OUR MISSION
We provide highly efficient solutions for aeration, pH adjustment, oxidation and odor control to lower treatment costs and improve water quality.

OUR METHOD
Using Henry's Law, we inject dissolved oxygen, carbon dioxide or ozone into a small sidestream, providing the most efficient delivery methods on the market.

OUR SOLUTIONS
Since 2004, we have expanded our core technology into two product lines: the Core Series, the ultimate in precision and control, and StreamLine, a more simplified solution. Each unit is custom-engineered to meet your needs.

OUR TEAM
We employ the industry's top talent. Our team of experienced designers, engineers, technicians and salespeople work together to deliver an efficient, effective solution for your water treatment needs.

AWARDS

2015 **GCCA GRAND PRIZE WINNER**
Recipient of the Global Cleantech Cluster Association's Later Stage Award

2010 **WEF INNOVATIVE TECHNOLOGY AWARD**
Recognized by the Water Environment Federation for our groundbreaking dissolution system

Side by Side SOLUTIONS

SDOX | **StreamLineO2**

Our SDOX and StreamLine02 utilize a pressurized process to rapidly and efficiently dissolve oxygen in a sidestream, offering multiple benefits in a host of municipal, industrial and ecological water treatment applications.

SDOX: greater control and precision with a lower life-cycle cost
StreamLineO2: industry-leading efficiency at a lower upfront cost

Proven APPLICATIONS

- BIOLOGICAL TREATMENT
- EFFLUENT REAERATION
- ENVIRONMENTAL REMEDIATION
- ADVANCED AQUACULTURE

Standard FEATURES

PLUG & PLAY
We make installation simple. Just provide our factory-tested, skid-mounted unit with piping, electricity and an Ethernet connection, and your system will be ready to go in no time.

REDUCE/ELIMINATE BASINS
Don't build a basin if you don't have to. Conventional technologies often need large concrete basins, which require significant civil work. Our technology can eliminate the need for unnecessary construction, further reducing costs.

BUBBLE CONTROL
In competing systems, bubbles reach the surface without ever being absorbed. Our dissolution method can control bubble size, quantity or eliminate bubbles altogether - keeping gas in the water and money in your pocket.

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blueingreen.com
info@blueingreen.com

THE NEXT GENERATION OF AERATION TECHNOLOGY IS HERE

Winner of the WEF Innovative Technology Award, BlueInGreen's SDOX and StreamLineO2 are capable of treating water in a wide variety of locations and applications using dissolved oxygen.

ADAPTABLE AERATION
Treat your water your way. We offer customized aeration solutions - from in-pipe reaeration to lake and lagoon depths to activated sludge and aerobic digestion - capable of instantaneously increasing dissolved oxygen when and where you want it.

SHALLOW WATER
No job is too big or too small for BIG. Our technology can achieve maximum transfer efficiencies in as little as one foot of water, giving you additional flexibility throughout your treatment process.

LOWEST COST
The more efficient your water treatment system is, the more money you save. Luckily, BIG has an industry-leading 98% transfer rate, designed to treat your water and reduce your costs simultaneously.

DISSOLUTION EXPERTS
With over 10 years of experience, BIG employs a team of industry-leading designers, engineers and technicians. We are the gas dissolution experts, and we can prove it.

START TO FINISH
We can assist in all stages of the project process: designing, testing, training, start-up and even providing aftermarket needs throughout the life of your product. Our team is here to help you every step of the way.

PROUD PARTNERSHIP
With BIG, you're in good company. We directly partner with multiple oxygen generator manufacturers as well as gas storage and feed providers to offer a fluid, streamlined purchasing process.

COMPLETE SOLUTION
With BIG, you get it all. Our fully integrated and skid-mounted units include pump/motor, VFD, control panel with PLC and HMI, multiple operation modes and all associated piping, valves and instrumentation.

QUALITY GUARANTEED
We stand behind our technology. Every unit is factory-tested by our expert team of engineers at our U.S. manufacturing facility to ensure your equipment works both before and after it's installed.

When you think aeration, Think BIG.

POWER SAVINGS
By using variable frequency drives, our units offer the lowest cost of ownership on the market. With our efficient treatment technology, you pump less water, use less power and save more money.

CUSTOM SOLUTION
We design each unit with your project in mind. Our systems are available in several standard sizes and can be customized to meet your requirements. No job is too big or too small for BIG's proven solutions.

REMOTE CONTROL
You control the way you treat your water: automatically based on plant flow rates or to a preset delivery amount. Plus, this can all be controlled and monitored anytime, anywhere by phone or by web.

THINK BIG

AERATION VS OXYGENATION

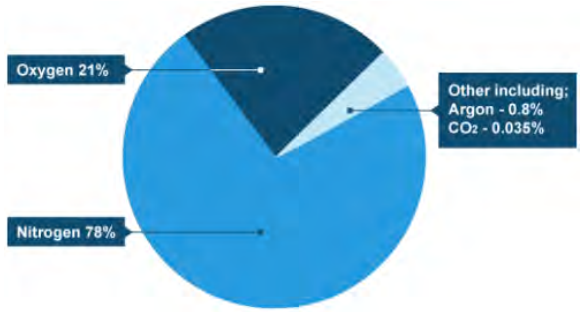
TERMINOLOGY MATTERS

Air is only about 21% Oxygen

Pure Oxygen is 100% Oxygen

~5X Greater Transfer Capability

Bugs use Oxygen to Degrade BOD



Most literature and references for the design of activated sludge systems is based on aeration, not oxygenation – this has several impacts to the overall design of these systems.

BlueInGreen
solutions for water quality

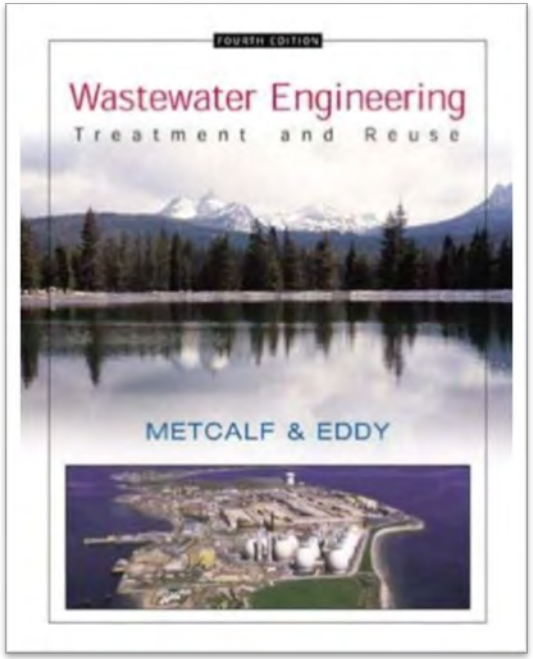
AERATION VS OXYGENATION

METCALF & EDDDY (1972, McGraw-Hill)

PURE-OXYGEN SYSTEMS

A number of advantages, such as…

- increased biological activity
- decreased sludge volume
- reduced aeration tank volume
- improved sludge settleability



BlueInGreen
solutions for water quality

OXYGENATION BY BLUEINGREEN

When oxygen is bubbled into wastewater, the microorganisms (bugs) have to consume the oxygen from the gas-liquid interface of the bubble.

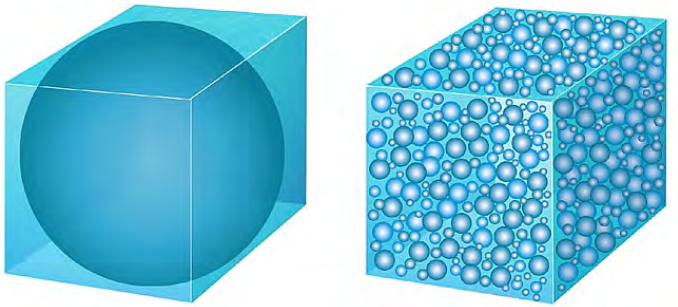
The total surface area of the bubbles essentially create a limiting factor for oxygen consumption by the bugs – we call it 'bioavailability'

BIG technology fully dissolves oxygen into the wastewater, and the majority of the oxygen is delivered to the process at the molecular (off the chart) and nano level.

With BIG technology, the oxygen is readily 'bioavailable' for the bugs which ultimately enhances the proven benefits of the high purity oxygen activated sludge (HPOAS) process.

Size Definition

Coarse	> 10 mm
Medium	= 4-9 mm
Fine	= 1-3 mm
Micro	< 0.5 mm
Nano	< 0.01 mm



BlueInGreen
solutions for water quality

Efficiency

Aerator Type	SAE $kg_{O_2}\ kWh^{-1}$	Low SRT AE (@ 2 $mg_{DO}\ l^{-1}$)	High SRT AE (@ 2 $mg_{DO}\ l^{-1}$)
High-speed surface aerator	0.9–1.3	0.4-0.8	
Low-speed surface aerator	1.5–2.1	0.7–1.5	
Coarse-Bubble	0.6 –1.5	0.3-0.7	0.4-0.9
Turbines or jets (Fine-bubble)	1.2-1.8	0.4-0.6	0.6-0.8
Fine-Pore (Fine-bubble)	3.6–4.8	0.7–1.0	2.0–2.6

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Converting Clean Water Transfer Rates to Process Transfer Rates

- Converting clean water to process water transfer rates involves several straight forward equations that use parameters such as DO, temperature, barometric pressure, humidity.
- Two water quality parameters present more difficulty.
- The first is the Beta factor, or the reduction in oxygen equilibrium concentration (saturation concentration at the operating hydrostatic pressure) due to contaminants in the wastewater. The modern approach is to use the salinity of the wastewater, which is easily measured and use “handbook” salinity versus saturation tables.
- The alpha factor is more difficult. It ranges from 0 to 1.0 (values greater than 1.0 can be obtained in laboratory situations with small vessels or in sea water without surfactants).

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Nomenclature 3

α	Alpha factor, i.e. ratio of process- to clean- water mass transfer. = αSOTE / SOTE , or
	= kLa process water / k_La clean water
F	Fouling factor = αSOTEnew diffuser / αSOTEused diffuser
αF	Alpha factor for used diffusers = α F
αSOTE	Oxygen transfer efficiency in standard conditions in process water
αFSOTE	Oxygen transfer efficiency in standard conditions in process water for used diffusers
αSAE	Aeration efficiency in standard conditions in process water
αFSAE	Aeration efficiency in standard conditions in process water for used diffusers

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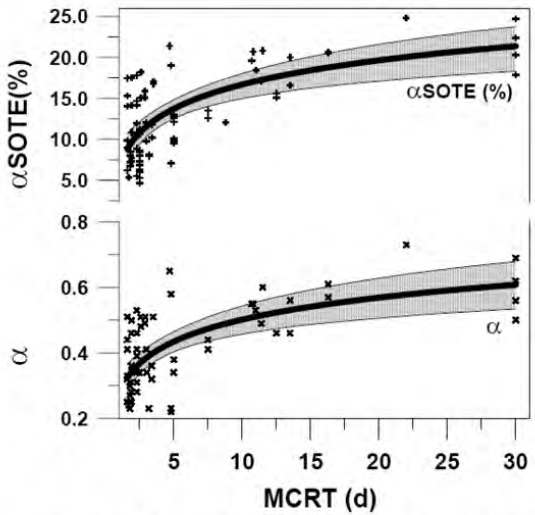
Alpha Factor 2



This figure shows the alpha factor (bottom) and the αSOTE (%, top). For treatment plants operating at low MCRT, alpha factors are supressed, and may average 0.3. The range shown in the figure is associated with new (higher values) versus old (lower values). At high SRT the alpha factors increase.

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INDUSTRIAL WASTEWATER – JOPLIN, MO

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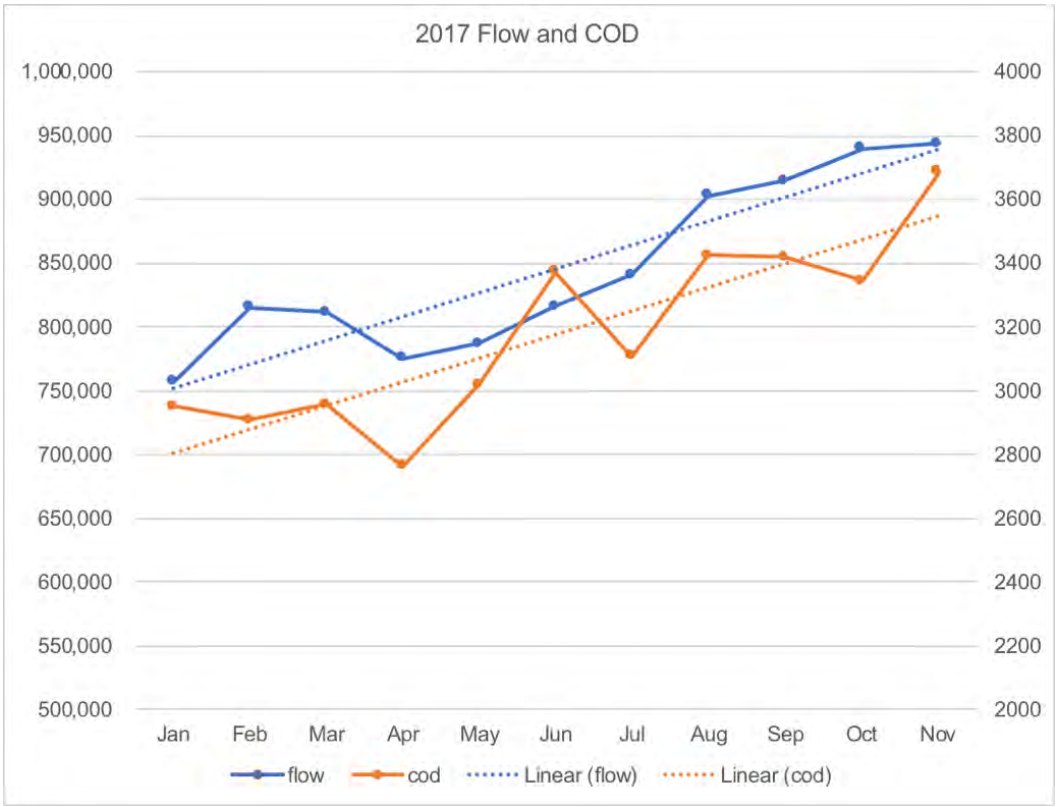
INDUSTRIAL WASTEWATER – JOPLIN, MO



	flow	cod	calc cod	avg cod	peak cod
Jan	757,000	2951	18,631	17,000	58,000
Feb	815,000	2906	19,752	19,700	40,100
Mar	811,000	2957	20,000	20,000	36,500
Apr	775,000	2762	17,852	17,800	32,300
May	787,000	3018	19,809	19,800	30,400
Jun	815,900	3372	22,945	23,100	41,500
Jul	840,600	3108	21,789	21,700	36,800
Aug	903,000	3425	25,794	25,600	37,700
Sep	914,000	3417	26,047	24,000	36,400
Oct	939,800	3345	26,218	26,300	36,600
Nov	943,800	3685	29,006	29,000	31,400
Dec					
2017 Increase	25%	25%	56%	71%	

BlueInGreen
solutions for water quality

JASPER PRODUCTS – JOPLIN, MO

	Existing Aeration System(s)	BIG | SDOX Capital Solution	Technology Value Realized
Capital Cost			
Equipment	$ -	$ 1,678,900	
Estimated Installation	$ -	$ 503,670	
Total Capital Cost		**$ 2,182,570**	
Annual Operating Cost			
Monthly Service Agreement			
$/mo			
Power			
Installed HP	1,425	600	
Operating HP	1,425	330	80%
Percent Operated	100%	100%	
$ / kWh	$ 0.08	$ 0.08	
$ / Year	$ 744,686	$ 172,454	
Oxygen			
Tank Lease	$ -	$ 25,000	
Oxygen Use (lb/d)	$ -	12,000	
Oxygen Price ($/100cf)	$ -	$ 0.40	
Oxygen Cost	$ -	$ 211,572	
Maintenance			
Operator Time			
Hours per Day	4	2	
Cost ($/hr)	$ 50	$ 50	
Operator Cost	$ 72,800	$ 36,400	
Equipment Repair			
General Maintenance	$ 50,000	$ 50,000	
Diffuser Replacement	$ 25,000	$ -	
Motor Repair	$ 40,000	$ 10,000	
Chemicals			
Histosol	$ 165,000	$ 33,000	80%
Oasis	$ 253,036	$ 50,607	80%
Equipment Rental			
Blowers	$ 240,000	$ -	100%
Surface Aerators	$ 120,000	$ -	100%
Sludge Hauling			
Terra Renewal	$ 209,260	$ 188,334	10%
Total Annual Operating Costs	$ 1,919,782	$ 752,366	
Projected Annual Savings		**$ 1,167,416**	
Simple ROI Period		**1.9 years**	
Projected 5-yr Savings to Customer		**$ 3,654,508**	

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MUNICIPAL VILLAGE
OXYGENATION – RBC / DIGESTION BIOLOGICAL

- Flow Rate: <1 MGD
- Application: RBC, Aerobic Digester, Primary Clarifiers, Misc Channels
- Solution: SDOX 200
- O_2 Delivery: 200 lbs/day
- Installation: Q4 2014
- Engineer: PDG

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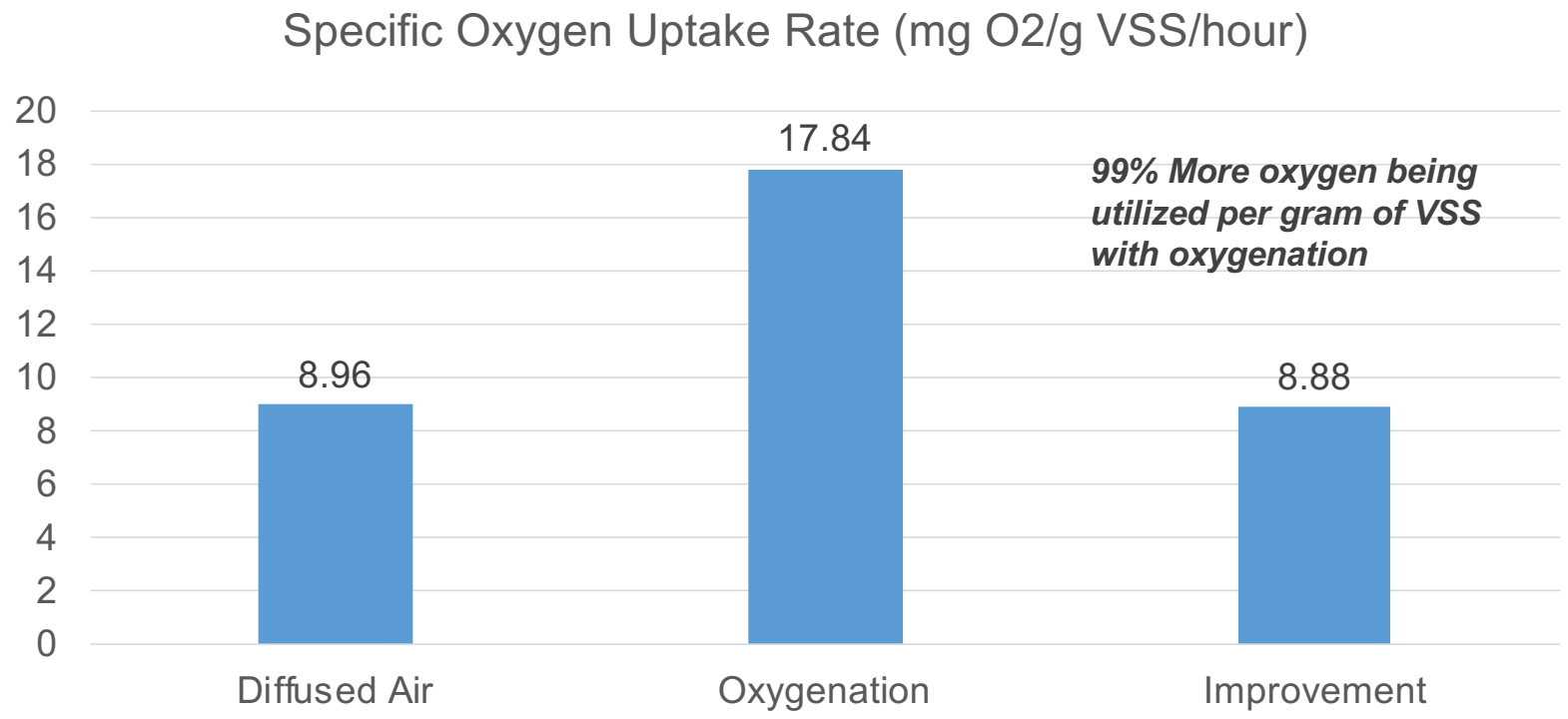
MUNICIPAL, ME OXYGENATION



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DEL MONTE First Large Oxygen Installation in F&B

- Flow Rate: 1.5 MGD
- Application: Industrial Lagoon Aeration
- Solution: SDOX 800
- O_2 Delivery: 6,000 lbs/day
- Installation: Q4 2014
- Engineer: USI Consulting

Project estimated to generate over $500,000/yr in savings from reduced municipal surcharges

Paper on project presented and published by the International Water Conference

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Simmons Foods LLC
N
Simmons
Google earth
1996
Imagery Date: 3/20/2016 36°32'44.43" N 94°36'15.15" W elev 960 ft eye alt 1614 ft

SIMMONS FOODS – SW CITY, MO
OXYGENATION – LAGOON BIOLOGICAL

- Flow Rate: 1.5 MGD
- Application: Lagoon Aeration
- Solution: 2x SDOX 800
- O_2 Delivery: 20,000 lbs/day
- Installation: Q4 2017
- Engineer: BIG

- Project estimated to generate $650k/yr in energy savings and $1.2M/yr in total O&M savings

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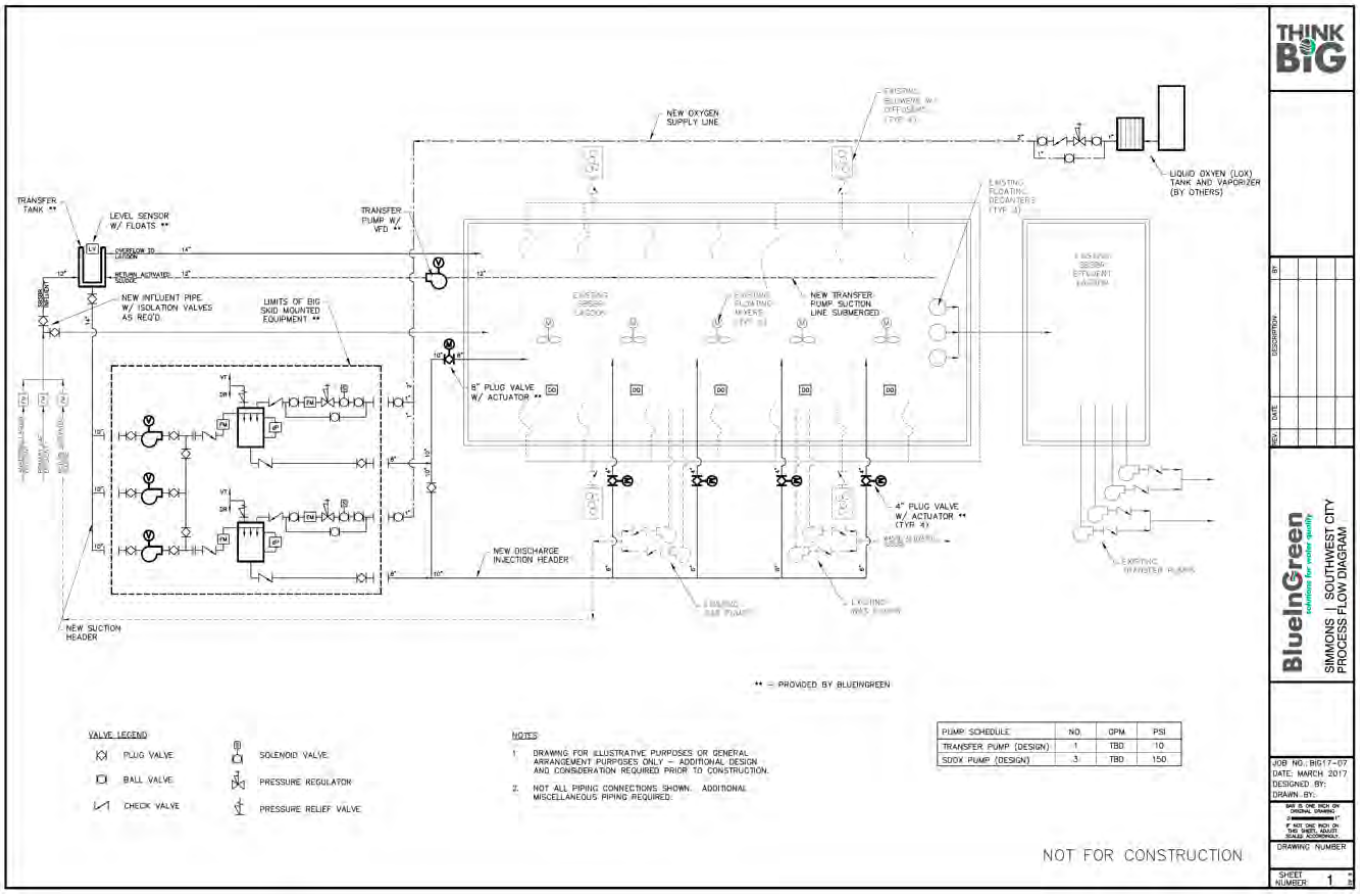
SIMMONS FOODS



Project Drivers Included:

- Need for increased capacity
- Need for Increased MLSS Temperature in Cold Months to support Nitrification
- O&M Savings related to reduced horsepower as well as operational controls

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GTH
1056
Genie
10150897
10150897


WARNING
CORNELL

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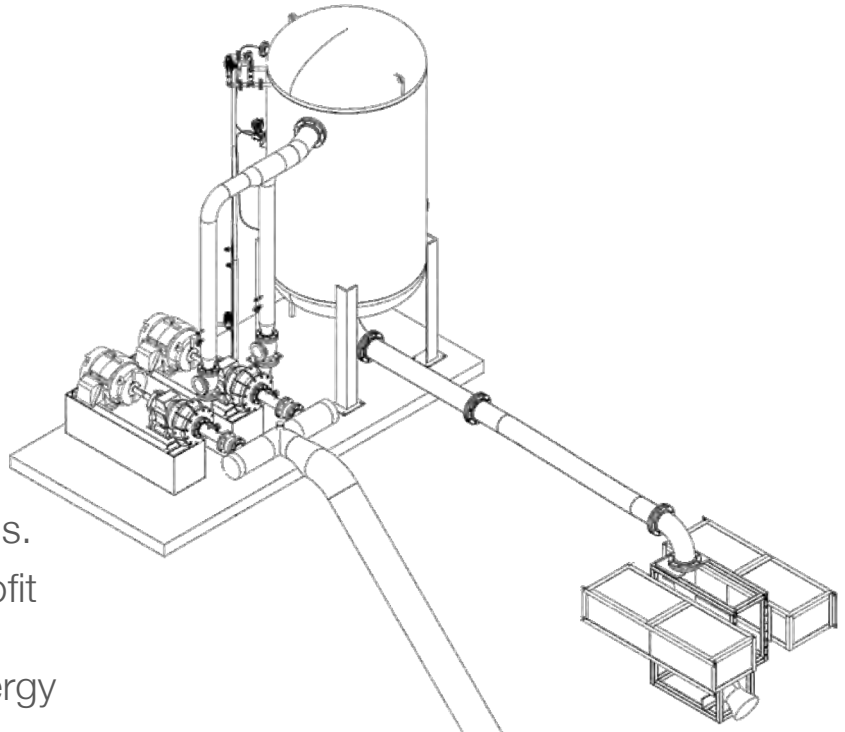
TYSON FOODS – SCRANTON, AR
OXYGENATION – OXIDATION DITCH

- Flow Rate: 1.3 MGD
- Application: Biological Aeration
- Solution: 2x SDOX 800
- O_2 Delivery: 20,000 lbs/day
- Installation: Q2 2018
- Engineer: BIG

- Project drivers include need for additional capacity, aging equipment, and energy savings.
- Dominant factor in decision was ability to retrofit without shutting down production at $Ms/day
- Project estimated to generate $800k/yr in energy savings and $680k/yr in total O&M savings.



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TYSON FOODS

Surface Aerator
Boneyard

Jet Aeration Header
Boneyard

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TYSON FOODS

Jet Aeration Pumps Required Multiple Rebuilds Due to Cavitation from Air

Busted Jet Aeration Headers Required Draining the Basins

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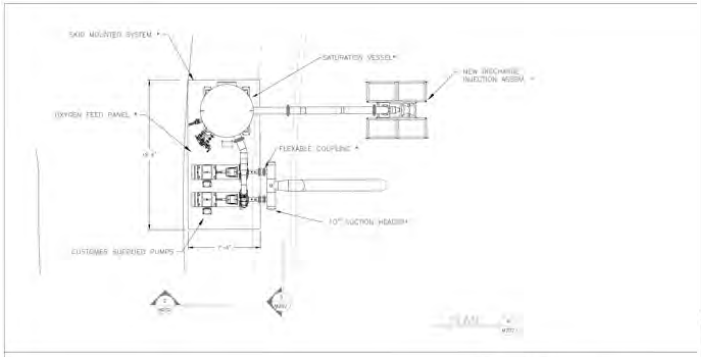
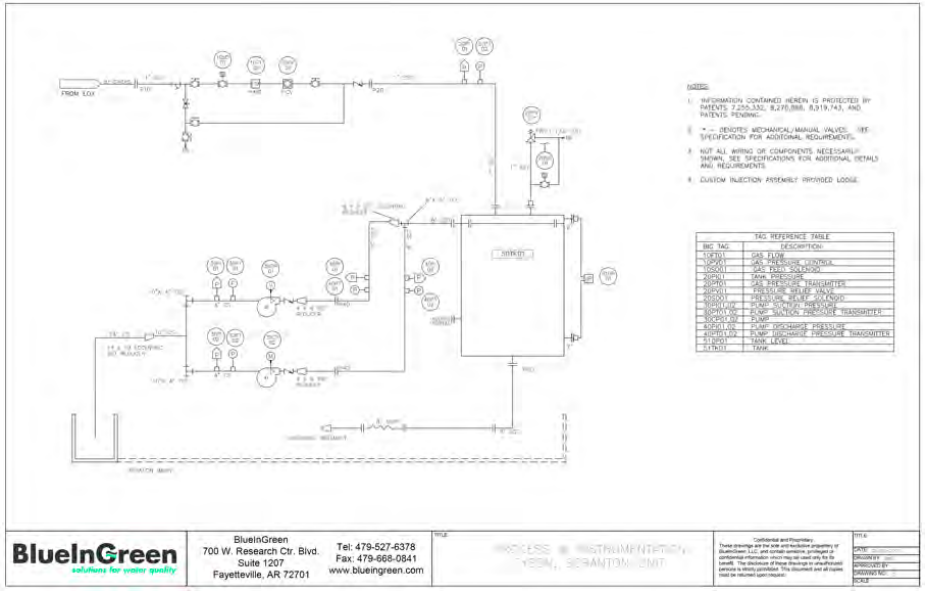
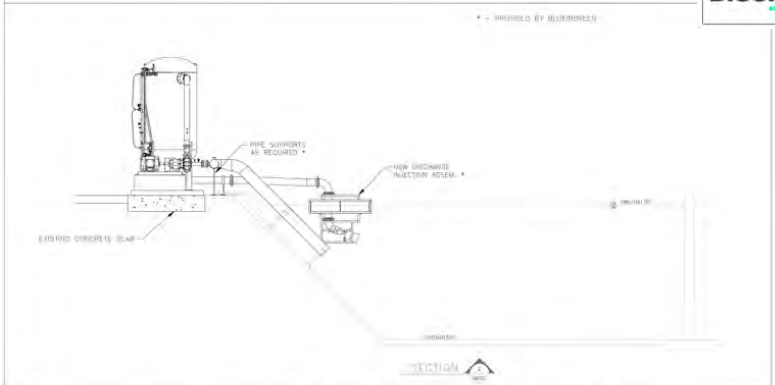
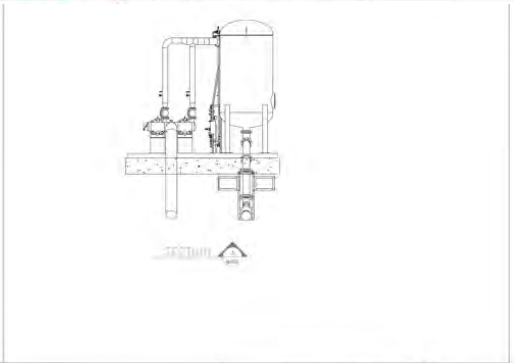
Tyson

TYSON FOODS









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BlueInGreen
700 W. Research Ctr. Blvd.
Suite 1207
Fayetteville, AR 72701
Tel: 479-527-6378
Fax: 479-668-0841
www.blueingreen.com
TITLE:
GENERAL ARRANGEMENT
INSTALLATION DETAILS
Confidential and Proprietary
These drawings are the sole and exclusive propertery of BlueInGreen, LLC, and contain sensitive, privileged or confidential information which may be used only for its benefit. The disclosure of these drawings to unauthorized persons is strictly prohibited. This document and all copies must be returned upon request.
TITLE:
DATE: 12-06-2017
DRAWN BY:
APPROVED BY:
DRAWING NO.: 1
SCALE:

Suction and Discharge Allows for Easy Maintenance Without Draining the Basin

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STINGER

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CORNELL

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SOMETHING BIG IS HERE.

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BIG | BIO2

Next generation treatment, delivered.

BlueInGreen's BIO2 mobile treatment solution utilizes a pressurized process to rapidly and efficiently dissolve oxygen in a side stream, offering multiple benefits in a host of municipal, industrial and ecological water treatment applications. The best technology in the world, now available anywhere in the world.

PLUG + PLAY

Fully functional containerized system, for easy start-up and single-source operation

AUTOMATION + CONTROL

Fully automated start/stop, featuring feedback monitoring for unparalleled responsiveness

INSTRUMENTATION + MONITORING

Comprehensive system coordination for optimized performance

NO CONSTRUCTION

Provisional functionality eliminates the need for unnecessary construction, further reducing costs

MOBILE CAPABILITY

Mobile technology offers more treatment applications in more locations than ever before

BIG GUARANTEE

A factory-tested, operator-approved solution backed by BlueInGreen's in-house design staff

STELLAR SUPPORT

Local support and service from BlueInGreen's award-winning team of engineers

Adaptable Aeration

Treat your water your way. We offer customized aeration solutions - from in-pipe reaeration to lake and lagoon depths to activated sludge and aerobic digestion - capable of instantaneously increasing dissolved oxygen when and where you want it.

Lowest Cost

The more efficient your water treatment system is, the more money you save. Luckily, BIG has an industry-leading 98% transfer rate, designed to treat your water and reduce your costs simultaneously.

Shallow Water

No job is too big or too small for BIG. Our technology can achieve maximum transfer efficiencies in as little as one foot of water, giving you additional flexibility throughout your treatment process.

TECHNICAL SPECS

- **2** 100HP GR Ultra-V Pumps
- **1** SST Saturation Vessel
- **1** AB Control Panel (MicroLogix, PanelView Plus)
- **1** Power Panel w/ 2x 100HP VFDs (including A/C, transformers, ancillary power)
- **1** 20-ft ISO Shipping Container Package (including lights, heat, ventilation)
- **1** All gauges, meters and instrumentation for automated control


PREMIUM
Mountaire
Fresh Young Chicken

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solutions for water quality

BlueInGreen
solutions for water quality

BlueInGreen
solutions for water quality


BlueInGreen
solutions for water quality
CAUTION
9'6" HIGH
CONTAINER

BIG AERATION SERVICES

Next generation water treatment technology, **when and where you need it.**

Flexible, Plug & Play Technology
The most efficient, dependable technology in a fully functional, containerized system. Rapidly and easily deployed and scaled to your needs, with the ability to be rapidly and easily removed or transitioned to new locations as your needs change.

Turn-Key, Monthly Performance Contracts
Whether it's a periodic need, an emergency response situation or simply a desire to consistently increase dissolved oxygen and treat more flow with higher loads using half the energy, we offer turn-key aeration solutions to meet your needs with the financial flexibility of a monthly contract.

Operational Continuity
Our extremely effective side-stream dissolution method enables our solution to be retrofitted to any in-pipe, basin or lagoon-based process. There is no need to drain the treatment basin, disturb existing equipment or otherwise interrupt treatment operations or upstream production.

Proven Technology
More than 50 installations deployed throughout North America treating more than one billion gallons per day, every day.

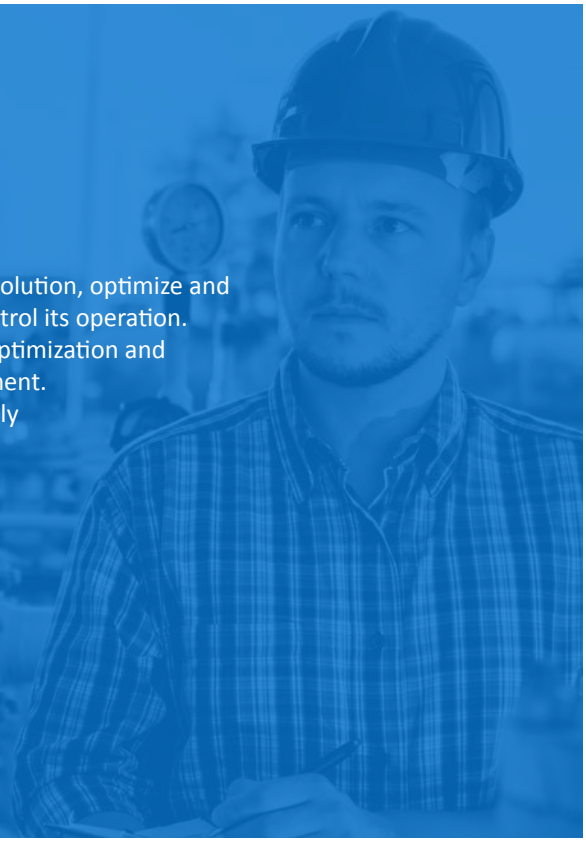
Treat More Using Less
Powered by BlueInGreen, our containerized SDOX® technology dissolves up to 40-times the oxygen in an extremely stable, supersaturated solution with 1,000 times the surface area compared to mechanical aeration equipment, enabling you to treat more flow with greater loads in a smaller treatment basin with half the energy costs and greenhouse gas emissions.

Modular & Mobile
Modular technology packaged in a robust, 20-ft ISO shipping container offers design flexibility and ease of future expansion, whether your process calls for one system or ten, anywhere in the world.

Minimal Site Preparation
Our containerized solution eliminates the need for unnecessary infrastructure and construction, further reducing costs.

Advanced Technology Control & Automation
Fully automated with precise, feedback control enabled by sensors and an advanced, programable logic controller provides unparalleled responsiveness and precision for optimum treatment and regulatory compliance in dynamic conditions.

Treatment as a service, when and where you need it.



Award-Winning Engineers & Operators

- Our team of experts will assess your needs, size and deliver the solution, optimize and automate the treatment process, and remotely monitor and control its operation.
- Engineering and operational expertise with a focus on process optimization and continuous improvement, ensuring efficient and effective treatment.
- Second-to-none performance contracting combined with monthly performance reporting.
- On-site knowledge transfer and operator training.

Remote Monitoring & Support

- Comprehensive system monitoring for optimized performance, including remote operation, wireless notifications and support from our engineers and operators.
- Digital dashboard enables performance monitoring. You see what we see. The information you need when you need it, wherever you are.

Some of Our Clients

BELLVILLE • OHIO •

Camaloch

C.O.M.C.D.

CITY OF FAYETTEVILLE ARKANSAS

Del Monte Quality

Georgia-Pacific

HARMONY NEIGHBORHOOD DEVELOPMENT

ifm WATER CYCLE TECHNOLOGIES

Jefferson Parish

Leprino Foods

Premium Mountaire Fresh Young Chicken

Simmons

Southwestern Power Administration

Tyson

University of Arkansas

U.S. Army Corps of Engineers

ONE BIG BOX DISSOLVES AS MUCH OXYGEN IN SOLUTION AS 12 SURFACE AERATORS.

APPENDIX E

FKC Proposals

FKC CO., LTD.

2708 West 18th Street
Port Angeles, WA 98363

(360) 452-9472
FAX (360) 452-6880

November 4, 2013

City of Show Low, Arizona
C/O PACE Advanced Water Engineering
426 N. 44th Street, Suite 120
Phoenix, AZ 85008

Re: FKC Co., Ltd. SCOPE OF SUPPLY

To Whom It May Concern:

This document details the FKC CO., LTD. scope of supply in reference to the City of Show Low, AZ Complete Sludge Dewatering System RFP from PACE / Job # A246A.

FKC Acknowledges Addendum #1 and #2.

In summary the scope of supply includes:

Equipment	Option #1 (Qty)	Option #2 (Qty)
Screw Press BHX 900 x 5000	2	2
Flocculation Tank	1	2
Polymer Injection Ring	1	2
Sludge Pump	2	3
Polymer System	1	2
Cross Conveyor	1	1
Incline Conveyor	1	1
Control Panel	1	1
TOTAL FOB Show Low, AZ	US$ 499,000.00	US$ 549,000.00

The following items are excluded from the scope of supply: equipment installation, field piping, and field wiring, any items not listed in this proposal, and taxes or bonding.

Enclosed is the information requested in items 1 – 13.

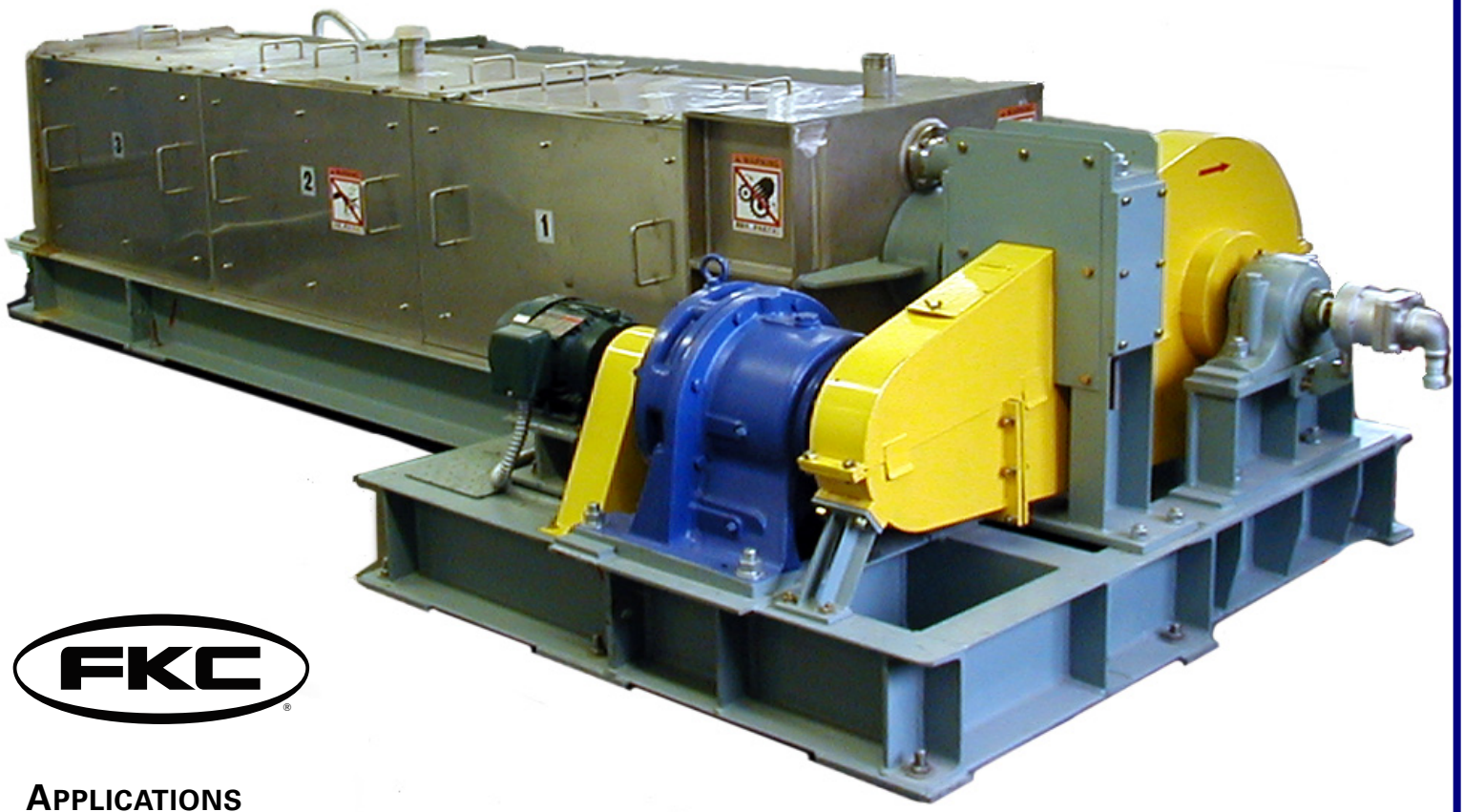
We hope this information is helpful. Please contact this office if you have questions, or if you need anything further to issue the purchase order.

Sincerely,
FKC Co., Ltd.

Wesley Bond

Biosolids Dewatering

FKC screw presses provide a unique, cost effective solution for dewatering of municipal and industrial biosolids. While relatively new to this market in North America, FKC screw presses have been dewatering various non-fibrous sludges and other materials for over 20 years in a wide variety of industries.



Applications

- Municipal WWTP Sludges of All Types (Aerobically Digested, Anaerobically Digested, Raw)
- Primary, Secondary, or Mixed Sludges
- Industrial Biosolids
- Septage & Grease Trap

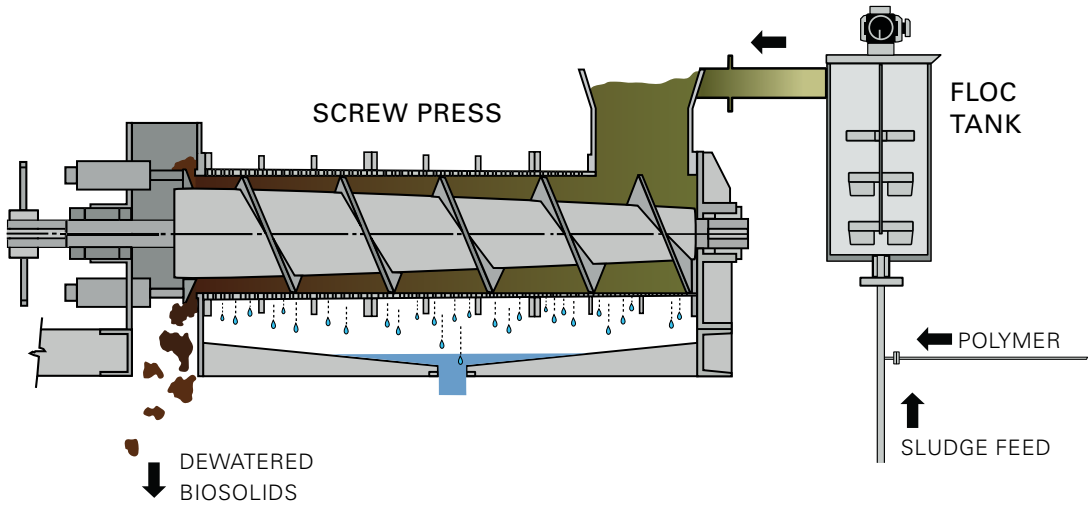
Small 12" diameter screw press installed at the City of Forks, WA

Features of the FKC Biosolids Dewatering Screw Press

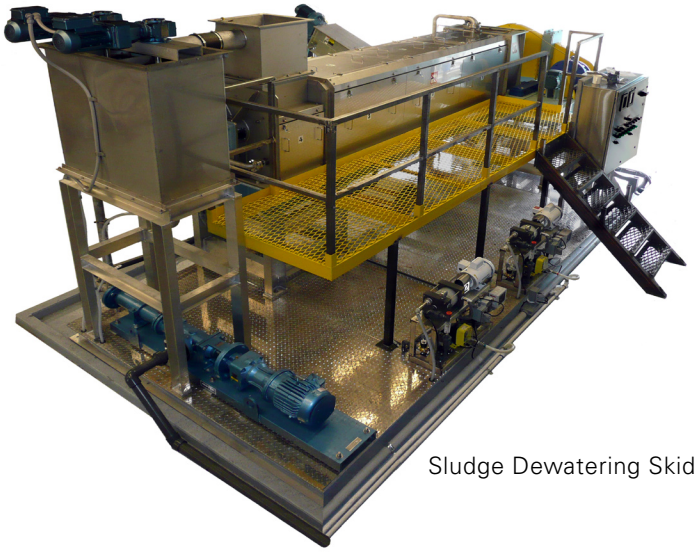
- Heavy Duty Construction
- High Outlet Consistency
- Slow Speed
- Few Moving Parts
- Very Low Maintenance
- Upgradeable to Produce Class A Biosolids
- Stainless Steel Wetted parts
- Low Power Consumption
- Fully Enclosed covers
- Simple, Unattended Operation
- Automated Washdown
- High Quality Construction

Two 1.25 meter diameter class A capable screw presses in Monterey, CA

Typical Sludge Dewatering Process Flow Diagram

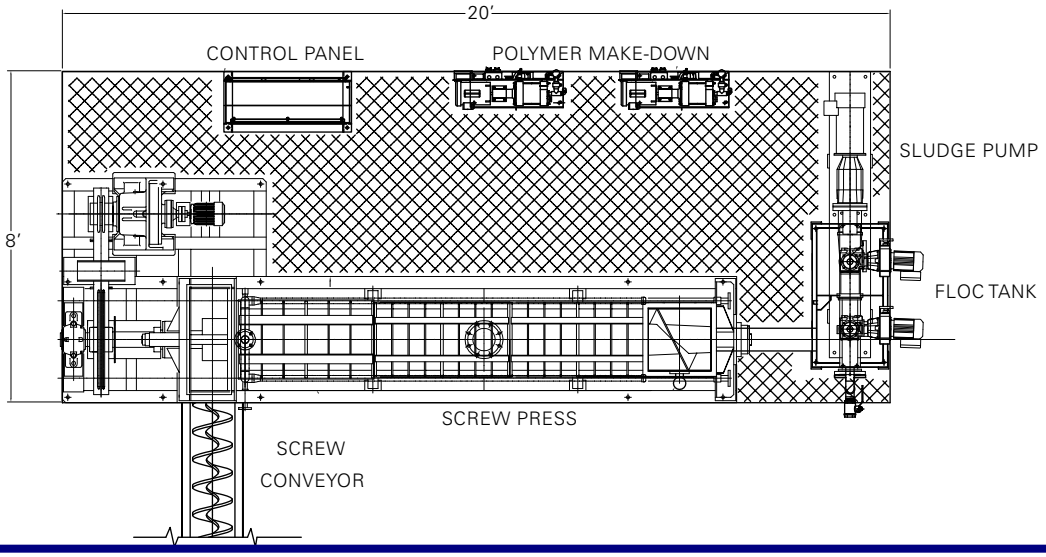


Dewatering Skid Systems for Small Applications

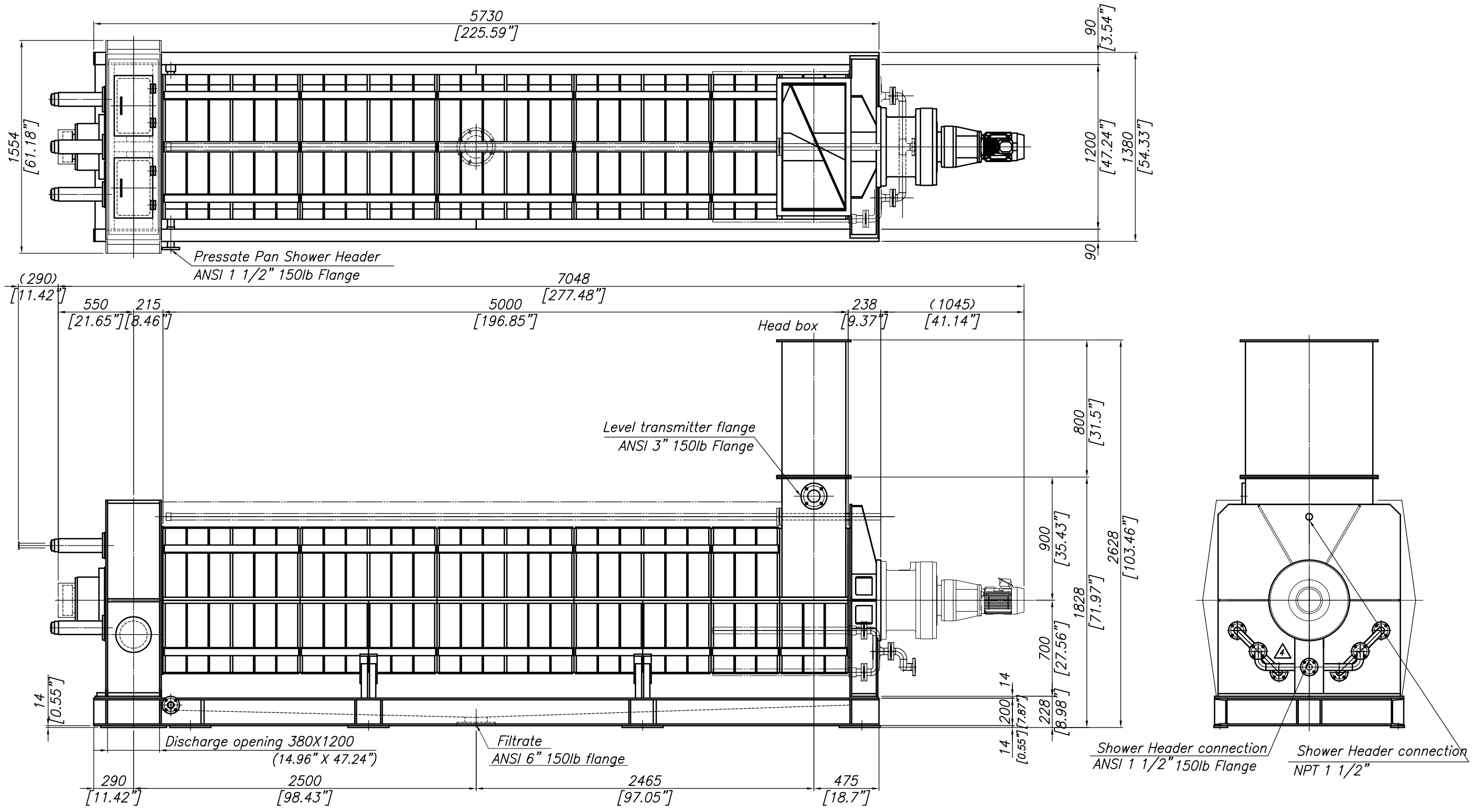


Sludge Dewatering Skid

Skid Mounted Packages



FKC Co., Ltd.
2708 W. 18th Street
Port Angles, WA 98363
(360) 452-9472
www.fkcscrewpress.com
mail@fkcscrewpress.com



Sumitomo Cyclo reducer
(with C-face motor adapter)
CHVJ-6235DA-7569

Variable speed
3 HP, 1800rpm (Frame No. 182TC)

Screw rev.
180 ~ 1800 X 1/7569 = 0.0238 ~ 0.238 rpm

Total weight = 6,000 kg (13,228 lbs)
Operating weight = 8,000 kg (17,637 lbs)

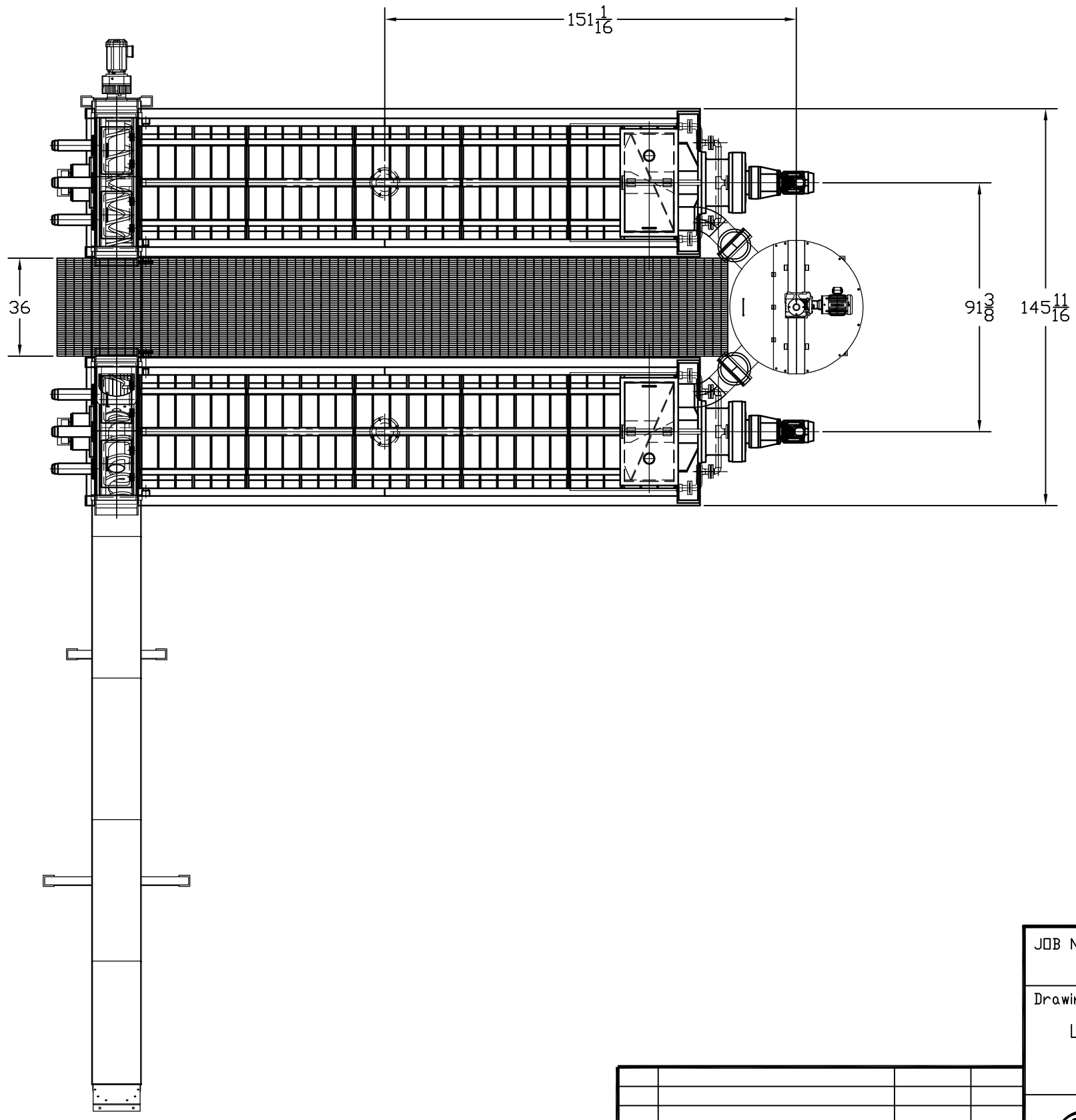
Rev.	Date	Description	Drawn by	Rev. by	Appd. by
1	11/1'13	Issued as Reference		RTB	
0	11/21'11		S.ENDO	H.ABE	T.OGAWA

発注先 Purchaser	FKC CO., LTD
最終客先 End user	Reference
工事名称 Job name	BHX-900X5000L Screw press
図面名称 Dwg. name	Assembly
工事番号 Job No.	M-
図面番号 Dwg. No.	S-01

Quantity	
2	
Scale	
1/20	
Ref. job No.	

配布先	
貿易部	.
FKC	.
営業部	.
QC部	.
QCファイル	.
製造部	.
設計部	.
釧路工場	.
大阪営業所	.
富士営業所	.
合計	.

FUKOKU KOGYO CO., LTD.



No.	Alteration	Date	Sign.
1	Issued as Reference	10/31/13	RTB

JOB No. SP-	Messrs. Reference	Quantity 1	Wt Lbs.
Drawing No. L-900	Title BHX-900x5000L 540 Gallon Flocc Tank 12" Conveyor Plan View	Date 10/31/13	
		Drawn by RTB	
			Ref. JOB No.

FKC CO., LTD.
2708 W, 18TH ST.
PORT ANGELES, WA 98363
(360) 452-9472 FAX (360) 452-6880

REVISION 1 | SHEET 1 OF 3

Scope Letter

RoS3-Q620 Scope of Supply

ITEM	QUANTITY	DESCRIPTION
1	1	**ROTAMAT® Screw Dewatering RoS3Q-620 Twin Design** Maximum Throughput (per machine): 55GPM (110GPM for both machines) Feed Concentration: 1.5% Solids loading: 400lb/hr dry solids per machine (800lb/hr dry solids for both machines) Average Cake Solids: 18% Polymer Consumption: 20lb active/dry ton Minimum Capture Rate: 90% Huber estimates based on previous applications the above performance is feasible, however, very little information on the sludge characteristics has been provided and no sludge testing has been performed. Huber bases the performance on the following characteristics: VSS% - 75% or less TDS% - less than 1000mg/l pH – 6-8 Minimum sludge temperature: 13°C Low levels of dissolved organic acids, chloride, phosphate, ammonia and other chemicals. Continually aerated sludge holding tank Please reference attached drawing for screw press layout and dimensions including maintenance space requirements. Including Two (2) press with: • 304 Stainless Steel Construction • Screw Diameter: 600mm (23.6”) • Wedge wire basket • Support legs • 3.0HP, 3ph/460VAC/60Hz gear shafted main VFD drive, Class 1/Div. 2 • One (1) solenoid valve, 2-way brass body, 110VAC/60Hz, Class 1/Div. 2 Ancillary Items skid mounted (prewired and pre piped): • One (1) Polymer injection ring • One (1) Flow meter for the sludge feed (Rosemont 8750WA32EST1A1FPSF010CA1NOM4)

		• Control Relays, [As Required] • Terminal Blocks, [As Required] • Intrinsically Safe Relays, [As Required] • UL Label • Two (2) NEMA 4X Pneumatic Control Panels • One (1) E-Stop Pull Cord, NEMA 7 • One (1) Conveyor Zero Speed Switch • Two (1) 1-hole, LCS, NEMA7, E-Stop • Two (2) NEMA 4X Junction Boxes The control panel will be require to control with the following: - (2) RoS3Q Presses - (2) Thin Sludge Feed Pumps - (1) Conveyor The control panel will be require to interface with the following: - (1) Inline Polymer Dosing System - (1) Polymer Flow Meter - (1) Sludge Flow Meter
3	1	**Manufacturer's services:** • One (1) trips, one (1) days total on site (excluding travel) to inspect installation. • One (1) trips, two (2) days total on site (excluding travel) for startup and training. • One (1) trips, one (1) days total on site (excluding travel) for a follow up inspection • Additional services are available on a per diem rate upon request

Pricing:

ITEM	EQUIPMENT	Price
1	**Screw Dewatering Equipment RoS3Q-620**	**Included**
2	**Control Panel as described above**	**Included**
3	**Manufacturer's services as described above**	**Included**
	TOTAL	**$488,160**

Optional Deduct Pricing:

ITEM	EQUIPMENT	Price
4	**Removal of skid mounting of Ancillary Equipment from Item 1**	**-$18,812**

HUBER TECHNOLOGY
WASTE WATER Solutions

Screw Press
ROTAMAT® RoS 3Q

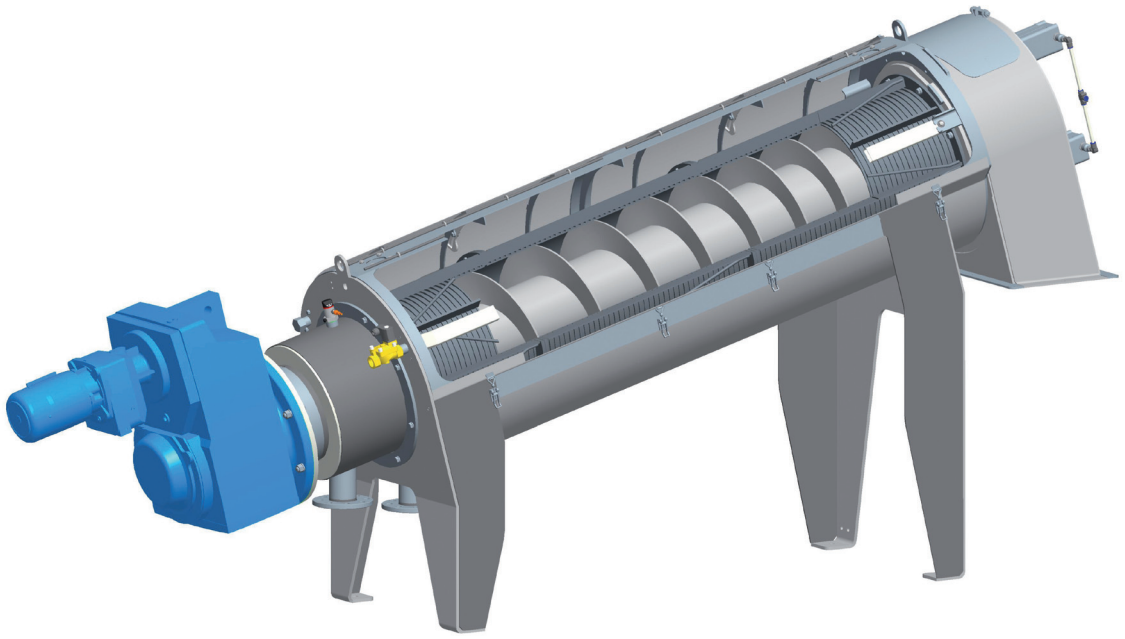
The RoS3Q Inclined Screw Press combine several benefits:

- Efficient and reliable operation
- Minimum operator attention
- Simple slow rotational design
- Energy efficient low hp motor
- High performance sludge dewatering
- Compact entirely enclosed machine
- Stainless steel construction

Excellent results

The incredible Huber Technology RoS3Q Inclined Screw Press for dewatering municipal sludge is providing impressive results in cake solids, polymer consumption, and capture rates. With its slow rotating auger the RoS3Q Inclined Screw Press can handle the toughest of sludge with ease.

The RoS3Q Inclined Screw Press can quietly run unattended by taking advantage of the fully automatic operation leaving plant personnel to be freed up to attend to other duties. By using only a fraction of the horsepower of other technologies, intermittent wash cycles, and frugal polymer dosing the RoS3Q Inclined Screw Press provides low cost of ownership.



Cost-effective sludge dewatering for independence in sludge disposal

The RoS 3Q is a screw press with a conical screw shaft and cylindrical sieves consisting of three treatment zones: inlet and drive zone, three-part thickening and dewatering zone, and press zone with pneumatic counter-pressure cone.

In the first part of the thickening and dewatering zone the supernatant is quickly removed by the feed pump via a large free filter surface at a low primary pressure. A pressure probe in the feed area controls the primary pressure thus ensuring a constantly high filtrate quality.

In the second part of the screen the volume of material between the screw flights is reduced by the conical screw and the sludge pressed against the inner screen surface so that the sludge is dewatered, with a continuous reduction of the filter cake thickness. The screen apertures are much smaller in this screen section.

In the third part of the screen the residual water is pressed out of the sludge, at a minimum filter cake thickness, by the pneumatic counterpressure cone at the press discharge. The dewatered sludge is pushed by the conveying screw past the pressure cone into the discharge chamber. The sludge residence time in the screw press and thus the filtration time can be adjusted to individual requirements by adjusting the rotational speed of the screw shaft.

HUBER TECHNOLOGY
WASTE WATER Solutions

RoS3Q Advantages

High dewatering efficiency

- defined sludge volume reduction in the screwpress
- continuously adjustable counter pressure at the discharge end
- strong drive torque for effective pressure generation
- continuous screen basket cleaning
- thin sludge cake

Reliable operation with little downtime

- virtually no wear because of low rpm screw rotation speed
- few moving parts
- sturdy stainless steel design
- easy access through large inspection openings
- simple self-monitoring control strategy
- possibility of unsupervised 24/7 operation
- proven in hundreds of installations

Minimum operation costs

- outstanding energy efficiency
- power consumption <0.01kWh/tDS
- little operator attention (<20min/day)
- minimum wear and tear,low spare parts costs
- low washwater consumption (<8% of sludge feed flow)
- high filtrate quality
- high solids capturer ate (usually>97%)

Low total investment costs

- compact design and smallfootprint
- optional tube flocculator
- integrated support legs
- vibration-free, virtually noiseless operation
- fully enclosed design

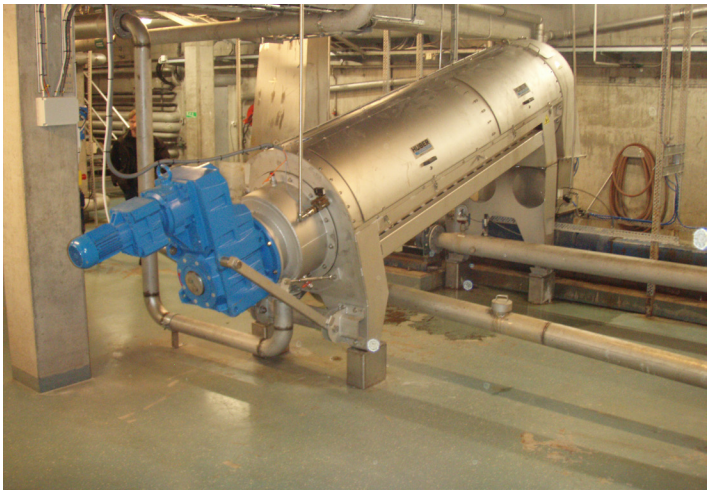
Model	Throughput*	HP
280	200 lbs/hr	0.5
440	400 lbs/hr	2
620	600 lbs/hr	3
800	1200 lbs/hr	4

* Throughput is variable due to sludge variations. Please confirm sizing with an authorized Huber representative.

RoS3Q Inclined Screw Press

RoS3Q 280

RoS3Q 440



RoS3Q 620

RoS3Q 800

Contact us

Huber's experience with municipalities and with wastewater processes is extensive as is its knowledge of the technologies it provides. This industry-technology insight allows Huber to work with organizations to ensure that systems are geared to perfectly match up to immediate tactical challenges and long-term strategic goals.

HUBER TECHNOLOGY, Inc

9735 NorthCross Center Court, Suite A - Huntersville, NC 28078

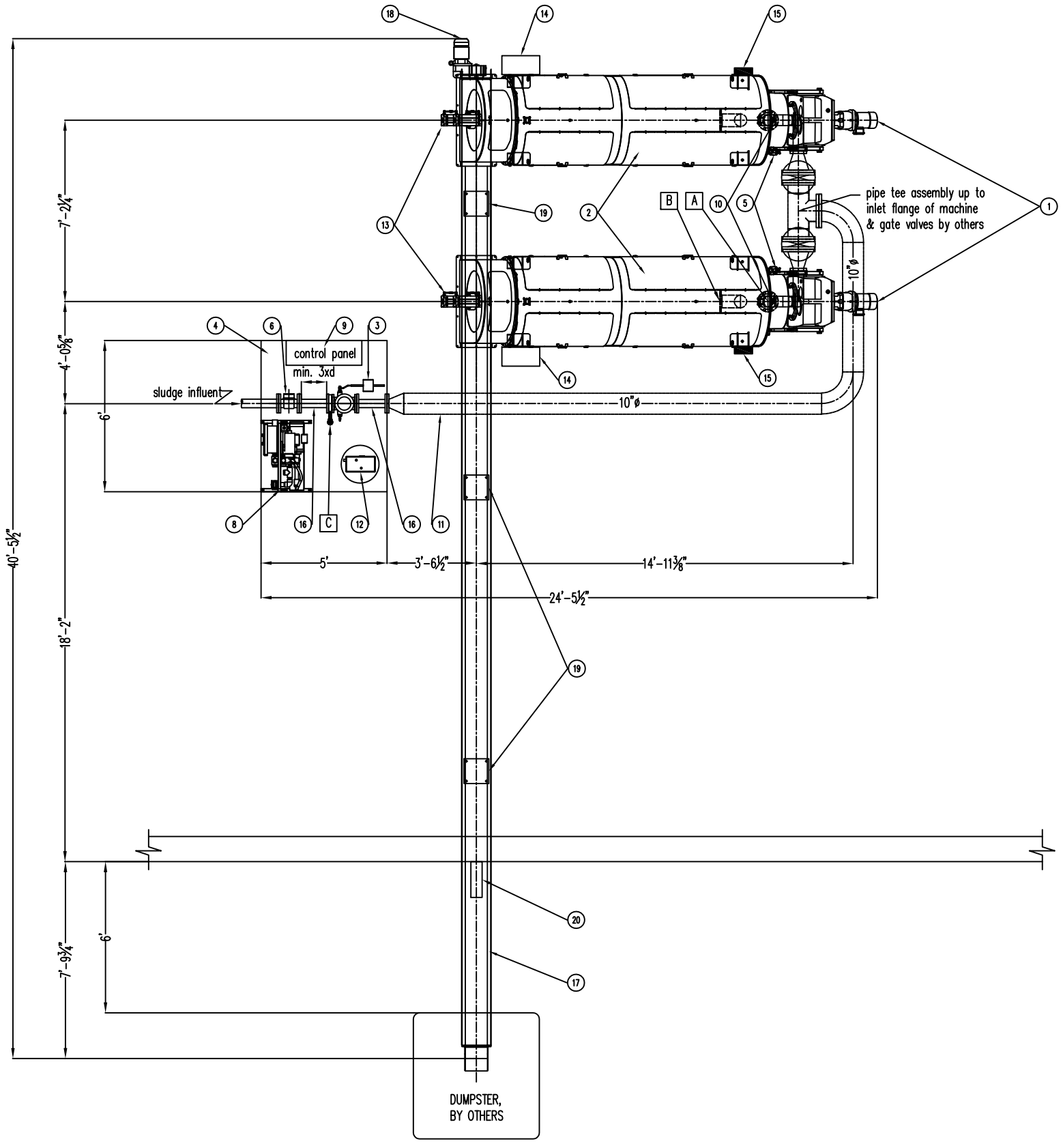
Phone: (704) 949 - 1010 - Fax: (704) 949 - 1020

huber@hhusa.net - http://www.huber-technology.com

Subject to technical modification

3-8-13 TRG

HUBER ROTAMAT® RoSQ Inclined Screw Press



BILL OF MATERIALS – HUBER SCOPE OF SUPPLY

1. Motor–Screw Press, 3hp, 3ph/460/60Hz, Cl.1, Div.2 (2x)
2. RoS3 Q620 Screw Press, 304SS (2x)
3. Polymer injection and mixing appliance DN100 (4")
4. 6'x5' auxillary skid, painted steel (OPTIONAL DESIGN)
5. Solenoid valve, Brass body, 110VAC/60Hz, Cl1, Div. 2 (2x)
6. Sludge Flow Meter, 4"ø *
7. Polymer Flow Meter, 1"ø , NOT SHOWN*
8. Polymer Blending System VeloBlend Model VM–5P–1200–D
9. Control Panel, 460V/60Hz
10. Pressure Sensor, IFM
11. Flocculation Reactor pipe assembly, BY OTHERS, 30lf @10"ø, SEE NOTE
12. Air compressor, 145psi max
13. Pneumatic cylinders –¼" compressed air connection
14. Pneumatic controls, NOT SHOWN
15. Junction box, pre–wired
16. Spool pieces, DN100 – 4" ANSI
17. Ro8T / 273 Screw Conveyor, 10° incline
18. Drive motor Ro8T, 1.5hp, 3ph/460V/60Hz, Cl.1, Div.2
19. Single–leg support
20. Special support

*minimum straight pipe run required for flowmeters as follows:
5x diameter upstream
3x diameter downstream

FIELD CONNECTIONS:

- [A] 4"ø ANSI flange – Thin sludge influent
- [B] 6"ø ANSI flange – Filtrate drain
- [C] Polymer feed to injection device

NOTE:
ALL PIPING BY OTHERS UNLESS NOTED OTHERWISE.
FLOCCULATION PIPE DESIGN BASED ON STANDARD DESIGN CRITERIA.
FINAL FLOCCULATION PIPING DESIGN MUST BE APPROVED BY HUBER ENGINEERING.

Dimensions are for reference only!
For binding dimensions please refer to the final installation drawings

PRELIMINARY

HUBER TECHNOLOGY
9735 NorthCross Center Court, Suite A
Huntersville, NC 28078
Tel. 704-949-1010
info@huber-technology.com

Show Low, AZ

Fig No.		Scale:
1/2	RoS3 Q620 TWIN Ro8T Screw Conveyor	3/16" = 1'–0"
Project No.		Drawing No. AZ_SHL_131031_0.dwg

350 SMC Drive
Somerset WI 54025
Phone: (715) 247-3433
Fax: (715) 247-3438

November 1, 2013

PACE Water Engineering
17520 Newhope St, Suite 200
Fountain Valley, CA 92708

Attn: Mr. Duong Do
Reference: RFP – Complete Sludge Dewatering System, Show-Low, AZ
Subject: Schwing Bioset, Inc. Quotation No. 2013304
Addenda: One (1) & Two (2) Acknowledged

Mr. Do,

Schwing Bioset, Inc. is pleased to propose the following as our scope of supply for the above referenced project. Design Conditions:

- Dewatering of 1.5 - 3.0% solids secondary WAS with minimal digestion, ≥ 18% solids sludge cake output, ≥ 90% solids capture rate
- Active Polymer Consumption: ≤ 20 lbs / dry ton sludge for sludge feed at ≥ 1.5% solids

SLUDGE DEWATERING SCREW PRESS

Option 1: One process line

Model:	FSP10HP
Quantity:	One (1)
Design Capacity:	919 dry pounds per hour per press 6,430 lbs / 7-hour work day
Press Length:	21 feet 8 inches
Press Width:	5 feet 4 inches
Press Height:	6 feet 10 inches
Shipping Weight:	17,380 lbs (press)
Operating Weight est.:	22,700 lbs (press)
Screw Press Motor	5 HP TEFC

Washwater Consumption:	85 gal total per 8-hour operating shift (40gpm @ 45-60psi for 2-3 minutes)

Option 2: Two process lines

Model:	FSP07HP
Quantity:	Two (2)
Design Capacity:	402 dry pounds per hour per press 6,430 lbs / 8-hour work day (both lines combined capacity)
Press Length:	16 feet 3 inches
Press Width:	3 feet 7 inches
Press Height:	5 feet 0 inches
Shipping Weight:	7,040 lbs (one press)
Operating Weight est.:	9,400 lbs (one press)
Screw Press Motor	3 HP TEFC
Washwater Consumption:	40 gal total per 8-hour operating shift (17gpm @ 45-60psi for 2-3 minutes)

Scope includes:

1. The SBI Screw Press system is designed for continuous dewatering of flocculated slurry. The system consists of a Screw Press dewatering unit, reaction tank, sludge feed pump, and liquid polymer system.
2. The Screw Press dewatering unit compresses and dewaters flocculated slurry using a screw rotating at very slow speed in a perforated screen. The filtrate will discharge from a drip tray below the perforated screen into a discharge pipe. Access doors allow a direct view of the dewatering process. The simple operating principle is achieved with only a few functional component groups. Slow movement and the high quality design of the structural components guarantee a high service life.
3. For general housekeeping purposes the back washing cycle cleans the screens automatically (generally 1x/day for less than 5 minutes). Dewatering operations are not interrupted during washing cycle.
4. Air compressor provided for discharge pressure cone actuator and movement of wash ring. One (1) air compressor provided for either one (1) or two (2) presses. Each press requires up to 0.6 ft^3 at 90psi per 8 hour operating shift (up to 0.25 cfm per press during wash cycle). Compressor requires separate electrical service 120V/1Ø/60Hz, 15 amps, standard wall outlet.
5. Effective flocculation is achieved in the mixing reaction tank. It is a closed design with rotating paddles and fixed flow breakers for effective mixing and gentle transport of the flocks.
6. Magnetic sludge flow meter (Endress & Hauser Promag) and reaction tank pressure sensor included for control of sludge feed to Screw Press. Magnetic sludge flow meter to be installed between sludge feed pump and reaction tank.

7. The Screw Press dewatering unit, reaction tank mixer, and sludge feed pump each include premium efficient, inverter duty TEFC motor, speed reducer, and a dedicated VFD drive in the main control panel (480V/3Ø/60Hz).
8. Screw Press and reaction tank are each shipped fully assembled including motor and speed reducer.
9. All wetted parts of Screw Press and Reaction Tank are 304 stainless steel.
10. The Screw Press must be located above the discharge cake conveyors (cake discharges continuously from bottom of press). This quote includes carbon steel supports for Screw Press, painted per specifications.

REACTION TANK

Option 1: One process line

Model:	RT10
Quantity:	One (1)
Volume:	1900L (502 gal)
Retention Time at design flowrate:	2.2 minutes
Outer Diameter:	3 feet 11 inches
Overall Height:	9 feet 0 inches
Motor:	2 HP TEFC inverter duty premium efficient

Option 2: Two process lines

Model:	RT07-08
Quantity:	Two (2)
Volume:	850L (225 gal)
Retention Time at design flowrate:	2.2 minutes
Outer Diameter:	3 feet 3 inches
Overall Height:	6 feet 9 inches
Motor:	1.5 HP TEFC inverter duty premium efficient

Scope includes:

1. Tank is constructed of 304SS and includes mixing rotor and fixed flow breakers for thorough mixing and flocculation of sludge with polymer.
2. Premium efficient, inverter duty TEFC motor and gearbox provided pre-assembled to top of tank. Tank is shipped fully assembled.

SLUDGE FEED PUMPS

Option 1: One process line

Model:	Boerger CL 390 – Rotary Lobe Pump
Quantity:	Two (2) (One duty, one backup)
Design Flowrate:	230 gpm
Max Flowrate:	264 gpm @ 30 psid, 300rpm

Gearbox reduction ratio	5.35:1
Length:	5 feet 10 inches
Width:	2 feet 2-7/8 inches flange-to-flange
Height:	2 feet 1 inch
Motor:	15 HP TEFC inverter duty premium efficient
Lobe material:	Buna N
Plumbing connections:	2 x 6” ANSI flange

Option 2: Two process lines

Model:	Netzsch - Progressive Cavity
Quantity:	Two (2) (both duty)
Design Flowrate:	90 gpm
Max Flowrate:	101 gpm @ 30 psid, 345 rpm
Length:	7 feet 4 inches
Width:	1 foot 0 inches
Height:	1 foot 4 inches
Motor:	5 HP TEFC inverter duty premium efficient
Stator Material:	Buna N
Plumbing connections:	2 x 4” ANSI flange

Scope includes:

1. Rotary Lobe provided pre-assembled with gear reducer and motor on galvanized steep base plate.
2. Netzsch PC pump offered as value alternate for option 2 above, see Appendix C for cut sheets and references.

POLYMER SYSTEM

Option 1: One process line

Model:	Velodyne VMT-10P-1200-Rpx
Quantity:	One (1)
Neat Polymer Flow Range:	0.5 – 10 gal/hr
Dilution Water Flow Range:	120 – 1,200 gal/hr (2 – 20 gpm)
Length:	2 feet 4 inches
Width:	2 feet 10 inches
Height:	5 feet 10 inches
Motors:	2 x ½ HP 90V DC with SCR for speed control
Power Supply:	120V/1Ø/60Hz 20amps

Option 2: Two process lines

Model:	EnPro Paradyne IA-S-5P-600-S
Quantity:	One (1)
Neat Polymer Flow Range:	0.25 – 5.0 gal/hr

Dilution Water Flow Range:	60 – 600 gal/hr (1 – 10 gpm)
Length:	2 feet 0 inches
Width:	2 feet 10 inches
Height:	4 feet 8 inches
Motors:	2 x ½ HP 120V/1Ø/60Hz with VFD for speed control
Power Supply:	120V/1Ø/60Hz 20amps

Scope includes:

1. Liquid Polymer system delivered as a pre-assembled skid complete with progressive cavity polymer pump, polymer/water variable speed mixer, motors, NEMA 4X FRP local control panel, and all internal wiring and plumbing.
2. Allen Bradley PLC with Ethernet communications and touchscreen HMI provided.
3. EnPro polymer system offered as value alternate for Option 2 above, see Appendix B for cut sheets and references.

CAKE CONVEYOR

Option 1 & Option 2: One process line

Model:	Thomas Conveyor inclined tube conveyor
Quantity:	One (1)
Design Flowrate:	82 ft^3/hr (5,103 wet lbs / hr)
Screw Speed:	40rpm (single speed)
Nominal Diameter:	12 inches
Conveyed Length:	30 feet
Equipment Length:	35 feet
Equipment Width:	1 feet 6 inches
Equipment Height (does not include incline):	2 feet
Motor:	3 HP TEFC premium efficient
Conveyor material:	304 SS
Conveyor empty weight:	Approx. 2,100 lbs
Conveyor operating weight:	Approx. 2,400 lbs
Conveyor inlet chute:	304 SS, One (1) included

Scope includes:

1. Inlet chute provided to connect to each screw press,
2. Conveyor includes zero speed switch, pull-cable e-stop, drain(s), and flush port(s).
3. Carbon steel supports included painted per specifications.
4. Conveyor discharge chute Not included. No slide gates included or needed.
5. Conveyor can be inclined discharge height of up to 7 feet above dewatering area floor. Should a second process line be provided, it will discharge dewatered cake into the conveyor 8 feet from the first press (center to center). A steeper incline would require Screw Presses to

be elevated over 4 feet above dewatering area floor.

SCREW PRESS CONTROL PANEL

Option 1: One process line

Quantity:	One (1)
Power Supply	480V/3Ø/60Hz

Option 2: Two process lines

Quantity:	Two (2)
Power Supply	480V/3Ø/60Hz

Scope includes:

1. Allen Bradley CompactLogix PLC and Panelview HMI.
2. The Control Panel shall control Screw Press dewatering unit, reaction tank, sludge feed pump, polymer system, and cake conveyor.
3. The Control Panel shall power all supplied equipment except polymer system and air compressor (separate 120V/1Ø/60Hz service for each).
4. Schwing Bioset standard analog input and output devices shall be provided.
5. Panel includes individual VFDs for Screw Press, reaction tank, and feed pump as well as starter for cake conveyor.
6. Enclosure shall be NEMA 4X, 304SS.

SPARE PARTS

See Tab G – O&M Cost Estimate Includes Spare Parts

FIELD SERVICE

Schwing Bioset shall provide a trained service technician to supervise system installation, assist start-up, and / or to train the owner's personnel in the operation and maintenance of the Schwing Bioset supplied equipment.

Option 1: One process line
The SBI service technician shall be made available for Eight (8) days over Three (3) trips.

Option 2: Two process lines
The SBI service technician shall be made available for Ten (10) days over Three (3) trips.

If required, additional SBI service may be purchased at the prevailing rates at the time service is performed. Current service rates are as follows:

- US $115.00 per hour – standard eight (8) hour day.
- US $172.50 per hour – overtime (over and above the standard eight (8) hour day.)

- US $230.00 per hour – Sundays and holidays.
- Travel and per diem (i.e., hotel, food, car) expenses at cost + 15%.

SYSTEM SUMMARY

Option 1: One process line

Dewatering Screw Press	One (1)
Reaction Tank	One (1)
Rotary Lobe Sludge Feed Pump	One (1)
Polymer System	One (1)
Cake Conveyor	One (1)
Screw Press Control Panel	One (1)
SBI Field Service:	Eight (8) days over Three (3) trips

Total price for the above listed scope of supply..... **SEE TAB B**
ALL Optional Adders ……..... **SEE TAB B**
Cost adder for One (1) inline solids meter……..... **SEE TAB B**

Option 2: Two process lines

Dewatering Screw Press	Two (2)
Reaction Tank	Two (2)
Rotary Lobe Sludge Feed Pump	Two (2)
Polymer System	Two (2)
Cake Conveyor	Two (2)
Screw Press Control Panel	Two (2)
SBI Field Service:	Ten (10) days over Three (3) trips

Total price for the above listed scope of supply..... **SEE TAB B**
ALL Optional Adders ……..... **SEE TAB B**
Cost adder for Two (2) inline solids meters……..... **SEE TAB B**

All prices are quoted:
F.O.B. Factory, Full Freight Allowed to jobsite
Price is valid for Six (6) months
Price is in US dollars

TAXES:

No taxes are included in this quote. The amount of any applicable present or future state/local sales/use tax or other government charge upon the production, sale, shipment, and/or use of the goods covered by this quotation shall be added to the invoice where appropriate.

TAB B - BID PRICE:

Option 1: One process line

Dewatering Screw Press – FSP10HP	One (1)
Reaction Tank	One (1)
Rotary Lobe Sludge Feed Pump (Boerger)	One (1)
Polymer System (Velodyne)	One (1)
Cake Conveyor	One (1)
Screw Press Control Panel	One (1)
SBI Field Service:	Eight (8) days over Three (3) trips

Total price for the above listed equipment scope of supply..... **$ 438,000.00**
Cost for Shipping to Jobsite..... $7,000.00
Cost for SBI Field Service $15,000.00
Optional Cost adder for Supply Bond…….....$ 6,500.00
Optional Five (5) Year Extended Warranty (see Maintenance Bond Below)……..….$ 25,000.00
Optional Cost adder for One (1) inline solids meter…….....$12,000.00

Option 2: Two process lines

Dewatering Screw Press – FSP07HP	Two (2)
Reaction Tank	Two (2)
PC Sludge Feed Pump (Note: alternate Netzsch)	Two (2)
Polymer System (Note: alternate EnPro used)	Two (2)
Cake Conveyor (accept sludge from both presses)	One (1)
Screw Press Control Panel	Two (2)
SBI Field Service:	Ten (10) days over Three (3) trips

Total price for the above listed equipment scope of supply..... **$ 426,000.00**
Cost for Shipping to Jobsite.....$14,000.00
Cost for SBI Field Service $20,000.00
Optional Cost adder for Supply Bond…….....$6,500.00
Optional Five (5) Year Extended Warranty (see Maintenance Bond Below)……..….$25,000.00
Optional Cost adder for Two (2) inline solids meters…….....$24,000.00
Optional Cost adder for Two (2) Boerger Rotary Lobe.....$7,000.00
Optional Cost adder for Two (2) Velodyne Polymer Systems.....$18,000.00

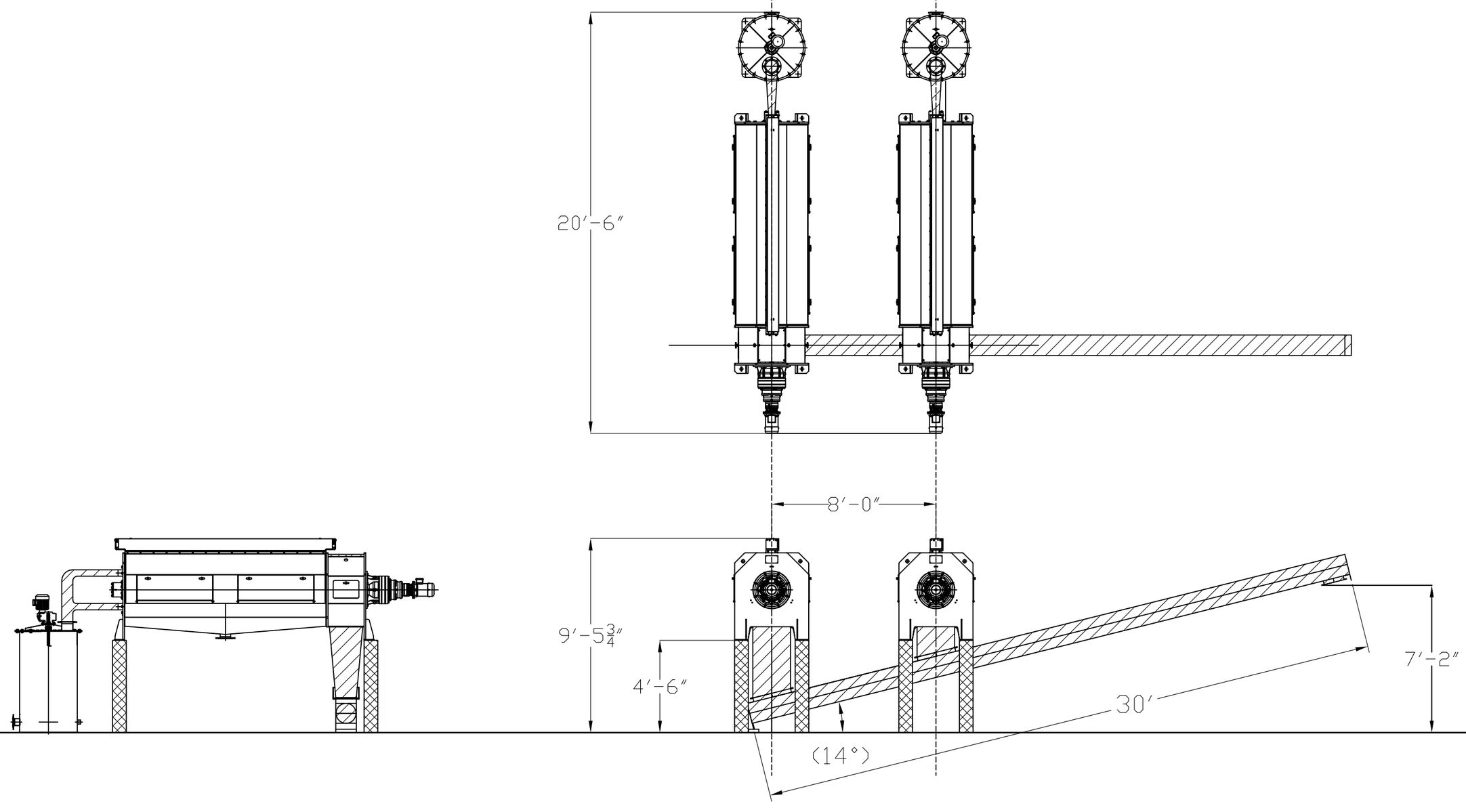
All prices are quoted:
F.O.B. Factory, Full Freight Allowed to jobsite
Price is valid for Six (6) months
Price is in US dollars

TAB B - BONDS:

Schwing Bioset has the capability to supply all of the Bonds required per the specifications. The following Bonds are offered with this proposal as follows:

1. ***Performance Bond*** – Per the specification this bond is included with the purchase price of the equipment above.
2. ***Supply Bond*** – Per the specification this bond is offer for the optional adder cost listed above for each option.
3. ***Maintenance Bond*** – Per the specification Schwing Bioset will supply a Five (5) year maintenance bond in lieu of having all of the necessary U.S. installations.
    a. Alternatively, Schwing Bioset would like to offer the Five (5) year extended warranty referenced above at no additional cost as opposed to providing the Maintenance Bond. The offer includes a yearly visit from our regional service tech to inspect the equipment.

REV	REVISION CHANGES	ECO #	NAME	DATE



GENERAL ARRANGEMENT COPY
NOT FOR FABRICATION

PROJECT / OWNER

Schwing Bioset, Inc.
Somerset, WI

DIMENSIONS OF NEW AND EXISTING STRUCTURES
Where the dimensions of new and existing structures are of importance in the installation or connection of any equipment supplied by Schwing Bioset, the Contractor must verify such dimensions and locations and notify Schwing of any required changes to its submittal drawings prior to the fabrication of any material or equipment which is dependent upon the correctness of such information.

SCHWING BIOSET INC.
350 SMC DRIVE
SOMERSET, WI 54025

LAYOUT DRAWING SHOW LOW AZ WWTP
2 x FSP07HP SCREW PRESS

DRAWN BY	NEW RELEASE	SIZE	DRAWING NUMBER	REV
TP		B	TP131101-1	
CHECKED BY	DATE	SHEET NUMBER		
	11/1/13	1 OF 1		
APPROVED BY	SCALE PLOTTED			
	1/60			

FKC CO., LTD.

2708 West 18th Street
Port Angeles, WA 98363

(360) 452-9472
FAX (360) 452-6880

April 2, 2019

Robert Murphy, PE
PACE Advanced Water Engineering
17520 Newhope Street, Suite 200
Fountain Valley CA 92708
Phone (714) 481-7226

Re: FKC Co., Ltd. Quotation QT11-040219aRO
Tuolumne CA WWTP – FKC Thickening Equipment

Robert:

FKC is pleased to provide a rotary screen thickener quotation for the Tuolumne CA WWTP sludge thickening project.

This proposal includes two options:

Option #1 – RDT and Floc Tank only

1 each FKC Model RST-S630x3000L Rotary Drum Thickener (RDT)
with 1 each 1.5-inch NEMA4X ASCO Solenoid Valve
1 each FKC Model 100GL Flocculation Tank with Agitator Assembly
with 1 each Omega LVC-511 Hi-Hi Level Switch
with 1 each Polymer Injection Ring and Mixing Valve
For a complete thickening system the following items would also be necessary but **are not included** in this option:

- Control panel
- Sludge feed pump
- Polymer makedown system
- Thickened sludge pump (optional)

Option #2 – Complete “plug & play” skid mounted sludge thickening system

1 each FKC Model RST-S630x3000L Rotary Drum Thickener (RDT)
with 1 each 1.5-inch NEMA4X ASCO Solenoid Valve
1 each FKC Model 100GL Flocculation Tank with Agitator Assembly
with 1 each Omega LVC-511 Hi-Hi Level Switch
with 1 each Polymer Injection Ring and Mixing Valve
1 each control panel
with ControlLogix PLC
with Maple System operator interface
with Allen Bradley 525 variable frequency drives
1 each sludge feed pump
progressing cavity type
1 each polymer makedown system
with progressing cavity neat polymer feed pump
with mechanical mixer
1 each thickened sludge pump
with 1 each Rosemount 2-inch Flanged Pressure Type Level Transmitter
All equipment shall be mounted to an aluminum skid including piping and wiring

For both options, the rotary drum thickener is quoted to accepting waste activated sludge (WAS) at a solids concentration of 0.6% - 2.8% at 100 gpm and thickening it to a minimum of 5% total solids but up to 7% if the sludge allows it. FKC could perform lab testing to determine the maximum allowable sludge thickness. Instruction for sending a sludge sample to FKC can be found at http://www.fkcscrewpress.com/labtesting.html .

We hope this information is helpful. Please contact this office if you have questions, or if you need anything further to issue the purchase order.

Sincerely,
FKC Co., Ltd.

Roger Olson

FKC
Rotary Drum Thickener
with
Flocculation Tank

QT11-032819aRO
April 2, 2019

Table of Contents

A. Proposed Equipment

Qty.	Description	FOB Tuolumne, CA *
1	FKC Rotary Screen Thickener Model RST-S630x3000L	**See Price Summary Paragraph B.3.**
	Material:	Municipal Waste Activated Sludge
	Inlet Capacity:	100 gpm
	Inlet consistency:	0.8 to 2.8% TS
	Max Polymer Dose:	13 lbs active polymer per ton dry solids**
	Outlet consistency:	5%-7% TS w / polymer use
	Solids Capture Rate	95% minimum or 450 mg/L TSS maximum
	Materials of construction:	SS-304 wetted parts SS-304 Base SS-304 Support Legs & Frame Other Painted Carbon Steel
	Speed reducer:	SEW Eurodrive Gearbox Motor: 2.0 HP 480V/3PH/60Hz Severe and Inverter Duty
	Other:	One (1) 100GL Flocculation Tank SS-304 Tank & Support Legs SEW Eurodrive Gearbox Motor: 1.0 HP 480V/3PH/60Hz with mechanical handwheel
	Delivery:	Delivery within Five (5) months after notice to proceed with manufacturing.

*Prices do not include taxes or bonding requirements

**Estimated - Actual Polymer Dose can be determined with future lab testing

B. Miscellaneous

1. Delivery

On-site delivery will be within Five (5) months after notice to proceed with manufacturing.

2. Shipping Arrangements

The FKC thickening equipment will be shipped best way overland from
Port Angeles, Washington to Tuolumne, CA.

3. Equipment Summary

The following summarizes the equipment offered:

(1) One FKC Model RST-S630x3000L Rotary Drum Thickener (RDT)
with (1) One 1.5-inch 316SS NEMA4X ASCO Solenoid Valve
with (1) One thickened sludge discharge chute
(1) One FKC Model 100GL Flocculation Tank with Agitator Assembly
with (1) One Omega LVC-511 Hi-Hi Level Switch
with (1) One Polymer Injection Ring and Mixing Valve

US$ 95,085 FOB Tuolumne, CA

This pricing does ***not*** include taxes or bonding.
This price does include onsite startup and training services.

Please note that this pricing does not include all the other equipment necessary for a complete thickening application; i.e. polymer system, feed pump, power control, logic control, field instrumentation, valves, etc.

4. Options Offered

Qty (1) One complete “plug & play” RDT skid mounted system

(1) One FKC Model RST-S630x3000L Rotary Drum Thickener (RDT)
with (1) One 1.5-inch 316SS NEMA4X ASCO Solenoid Valve
with (1) One thickened sludge discharge chute
(1) One FKC Model 100GL Flocculation Tank with Agitator Assembly
with (1) One Omega LVC-511 Hi-Hi Level Switch
with (1) One Polymer Injection Ring and Mixing Valve
1) One Control Panel, AB PLC based, Maple Systems Operator Interface
1) One Sludge Feed Pump, Progressing Cavity Type
1) One Polymer Makedown System
1) One Thickened Sludge Pump, Progressing Cavity Type
Skid Mounting including piping and wiring

US$ 197,595 FOB Tuolumne, CA

This pricing does ***not*** include taxes or bonding.
This price does include onsite startup and training services.

5. Effective Period

This proposal shall remain valid 60 days from the date of the proposal.

6. Payment Terms

10% with approval drawings
90% with delivery
Net 30 days

FKC understands that with some contract requirements, up to 10% of each milestone payment may be retained until successful performance is demonstrated.

7. Installation

The Rotary Screen Thickener is shipped ready for installation.

The Flocculation Tank is shipped ready for installation. Field assembly of the agitator drive, base and blades are required.

The solenoid valve and polymer injection ring / mixing valve are shipped loose and separate to be installed in the field by Purchaser.

8. Operator Training and Start Up

One (1) trip, three (3) person-days are provided for on-site services for the start-up, of the Rotary Screen Thickener and Flocculation Tank.

One (1) trip, two (2) person-days are provided for on-site services including performance testing and training of the Rotary Screen Thickener and Flocculation Tank.

Other installation and erection assistance are not included in the price of the equipment and generally are not required. However, the service is available for our standard service rates (see the enclosed rate sheet).

9. Warranty

FKC's mechanical warranty covers material and workmanship for a period of twelve (12) months from start-up or eighteen (18) months from delivery whichever occurs first.

10. Documentation Schedule

The drawings provided with this scope of supply are reference drawings only.

A. Approval Drawings - within 8 weeks after receipt of purchase order
   Buyer must return approval drawings within 14 days
   or delivery schedule will be affected
B. Certified Drawings - within 2 weeks after return of approval drawings
C. Operation and Maintenance Manuals - 14-16 weeks after approval of submittals and before equipment delivery.

11. Performance Guarantee

The performance figures and conditions denoted in section A of this proposal constitute FKC Co., Ltd.'s performance guarantee and the conditions required to meet the guarantee. All of the consistency figures are based on total solids (TS) not total suspended solids (TSS) unless otherwise indicated.

In the event that performance is not met, FKC will provide all parts, engineering, and labor associated with the work necessary to bring the equipment into conformance with the performance guarantee.

12. Notes and Clarifications

Seismic Anchorage Design is not included in the FKC scope and pricing.

13. Spare Parts List

No other spare parts are required for the first 1-2 years of operation. A list of long term spares in available upon request.

14. Service Rates

The following are rates and terms for professional and technical services furnished by FKC: If required, round-trip airfare (coach class) from Port Angeles, WA to airport nearest work site.

Weekdays

$1000.00 - Per eight (8) hour day on weekdays plus, lodging, and rental car expenses.
$187.50 - Per hour for all hours exceeding eight (8) hour workday on weekdays.
$108.00 - Per hour for office engineering services and telephone consultations.

Saturdays, Sundays and Holidays

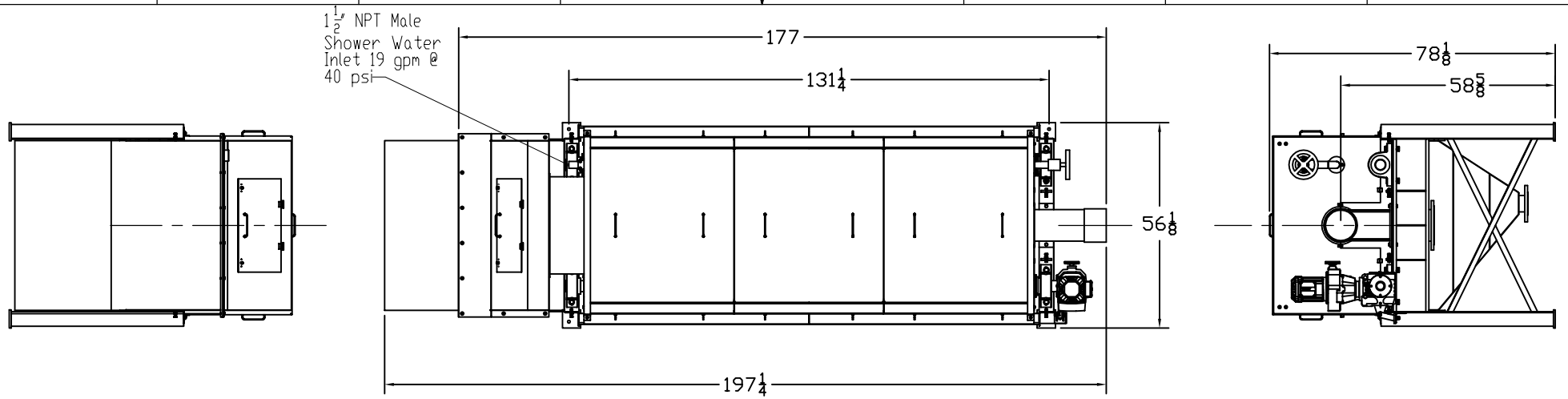
$1,440.00 - Per eight (8) hour day plus lodging and rental car expenses.
$270.00 - Per hour for all hours exceeding eight (8) hour workday.

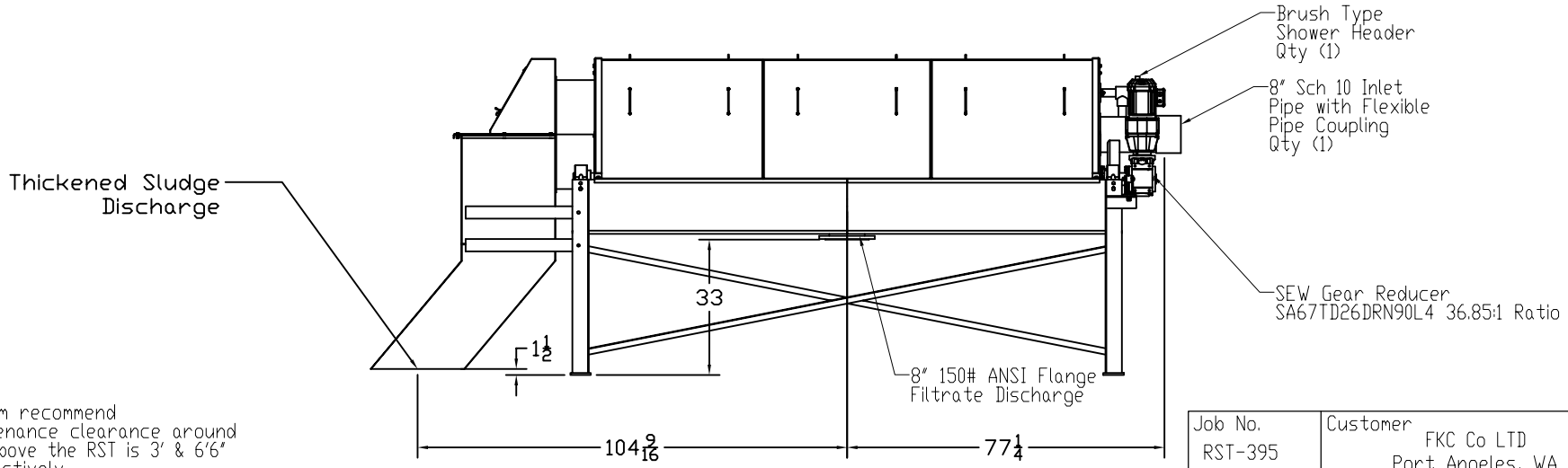
Travel Time - Weekdays

$80.00 - Per hour travel time. (Not to exceed $990/day)

Travel Time – Weekends and US Holidays

$120.00 - Per hour travel time (Not to exceed $1,440/day)



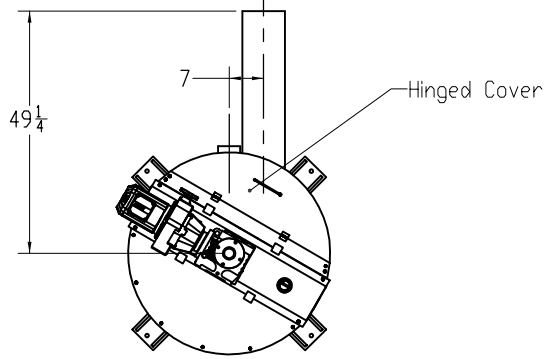


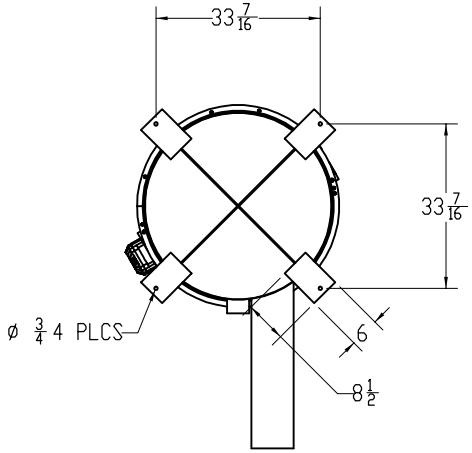
Notes:
1. Minimum recommend maintenance clearance around and above the RST is 3' & 6'6" respectively.
2. Material of Construction: 304L Stainless Steel
3. Equipment Weight: 3,200 lbs.
4. Operating Weight: 3,550 lbs.

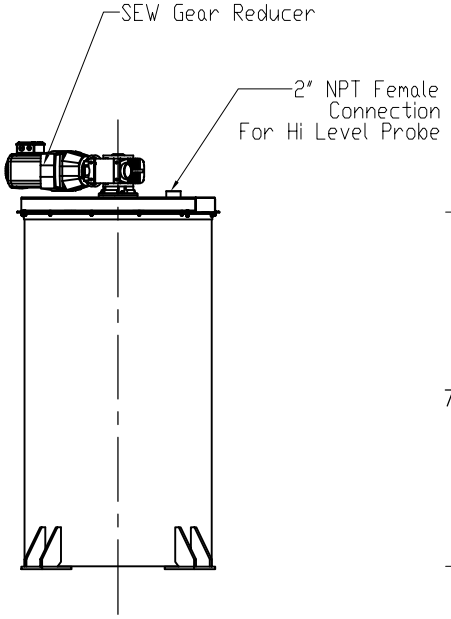
Drum Rev.
1750 x (.1 x 100) x 1 / 36.85 x 9.875/29.72 = 3.6~15.8 RPM

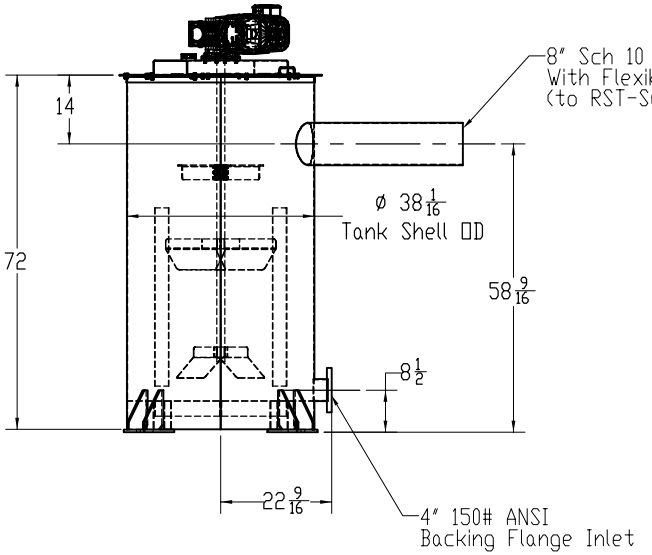
No.	Alteration	Date	Sign
0	Issued for Fabrication	2/28/19	RTB

Job No. RST-395	Customer FKC Co LTD Port Angeles, WA	Wt. Lbs.
Drawing No. A395-001	Title RST-S630x3000L Assembly Details	Quantity 1
		Date 3/29/13
	FKC CO. LTD 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880	Drawn By RTB
	Revision	SHEET 1 OF 4









Notes:
1. Tank Material: 304L S.S.
2. Equipment Weight: 800 lbs.
3. Operating Weight: 3,674 lbs.
4. Agitator Drive: SEW SAF67D26DRN90S4 36.85:1 Ratio
5. 1.5 Hp 1750 RPM Motor.
6. Agitator Speed 9.5~47.5 RPM
7. Speed controlled via handwheel

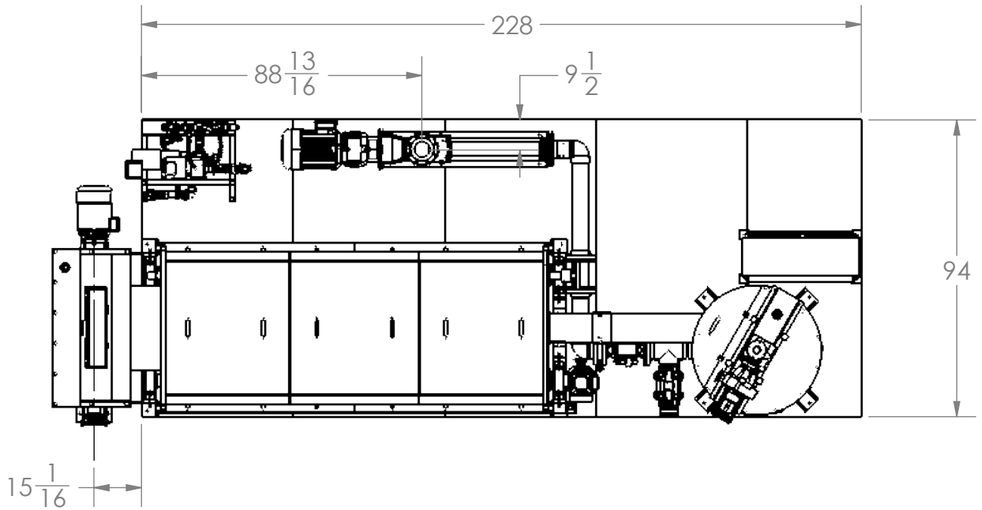
Job No. FT-395	Customer FKC Co LTD Port Angeles, WA		Wt. Lbs.
Drawing No. A395-200	Title 285 GAL Floc Tank Assembly Details		Quantity 1
			Date 4/9/13
	FKC CO. LTD 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880		Drawn By RTB

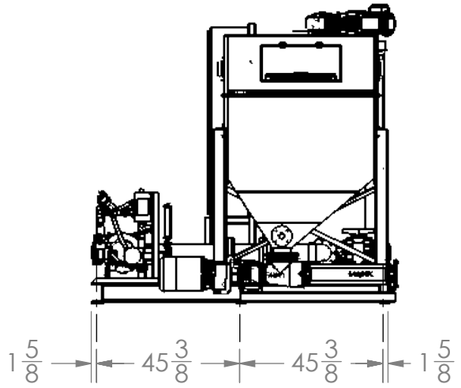
No.	Alteration	Date	Sign
1	Issued for Fabrication	3/4/19	RTB

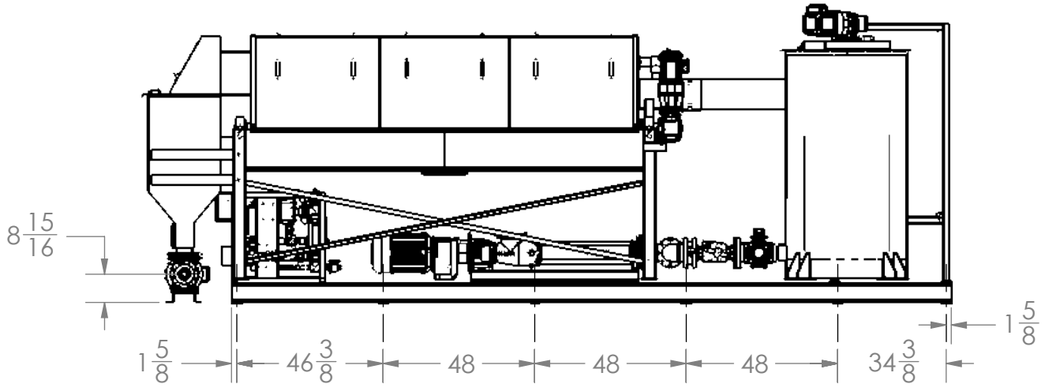
Revision

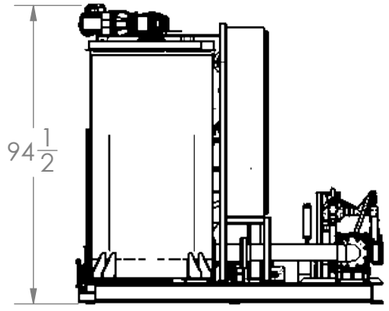
SHEET 1 OF 2

Notes:
- Equipment Weight: 7,000 LBS
- Operating Weight: 10,300 LBS
- All pipingto be sch 80 PVC
- Skid to be prewired and tested.
- 480 VAC



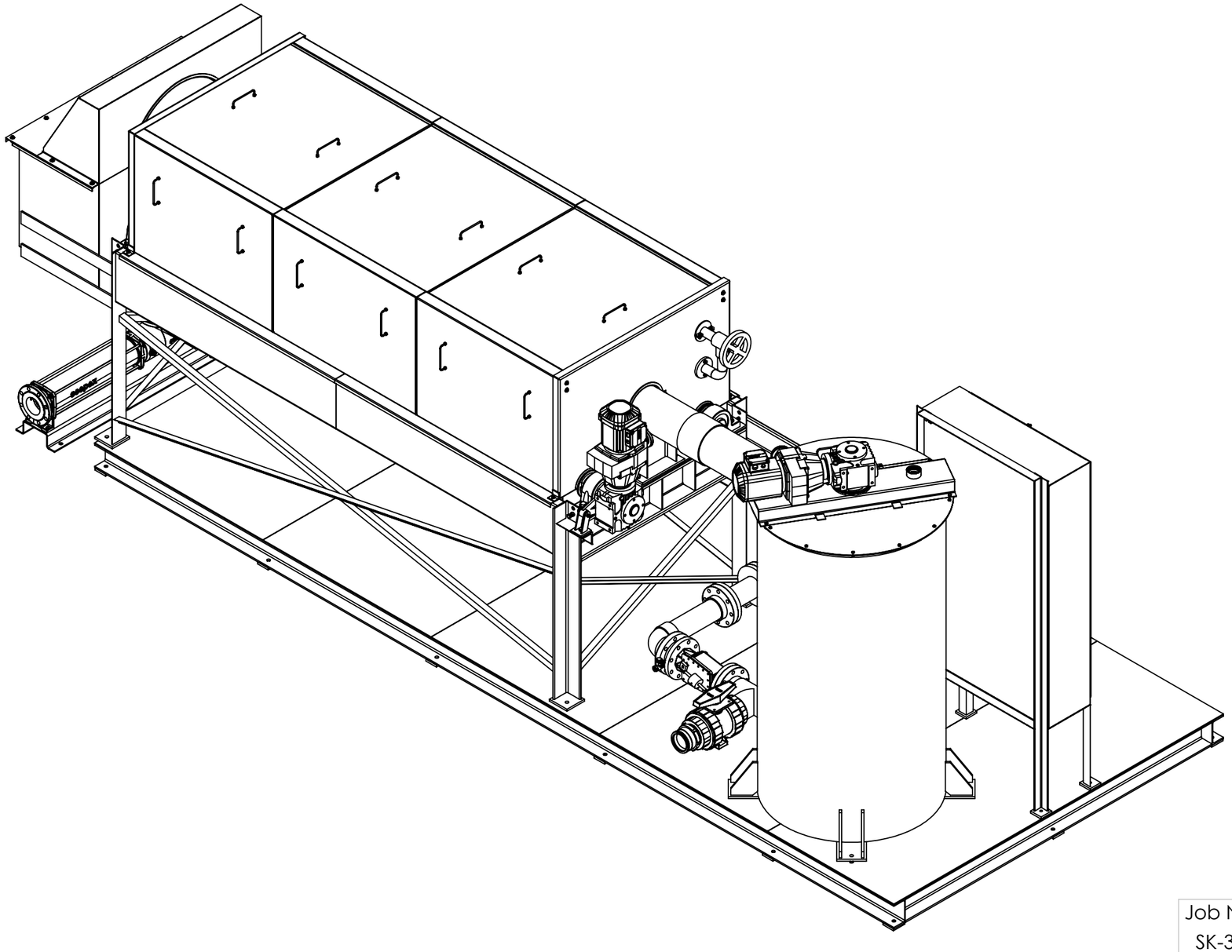






Job No. SK-395	Customer FKC Co LTC Port Angeles, WA		Wt. Lbs.
Drawing No. A395-900	Title RST-S630x3000L 285 Floc Tank Thickening Skid		Quantity 1
			Date 3/6/19
FKC	FKC CO. LTD 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880		Drawn By RTB
		Revision	SHEET 1 OF 1

No.	Alteration	Date	Sign
0	Issued for Fabrication	3/6/19	RTB



Job No. SK-395	Customer FKC Co LTC Port Angeles, WA		Wt. Lbs. 5231.75
Drawing No. A395-901	Title RST-S630x3000L ISO		Quantity 1
			Date 3/6/19
FKC	FKC CO. LTD 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880		Drawn By RTB
		Revision	SHEET 2 OF 2

No.	Alteration	Date	Sign
0	Issued for Fabrication	3/27/19	RTB

APPENDIX F

Anaergia and Gryphon Proposals

Anaergia
Breaking Barriers to Sustainability

AD Questionnaire

Date: 8/27/19
Submitted By: Matt Mills
Company / Project: PACE / Escalon

Primary Sludge to Digester

Flow (Current)	gal/day	100,000
Flow (Future)	gal/day	100,000
TS	%	0.5
VS/TS	%	0.95

Waste Activated Sludge to Digester

Flow (Current)	gal/day	100,000
Flow (Future)	gal/day	100,000
TS	%	1
VS/TS	%	0.9

External Waste to Digester

Type - (FOG, Commercial Liquid, Food, etc)		
Flow (Current)	gal/day	
Flow (Future)	gal/day	
TS	%	
VS/TS	%	
COD	mg/L	

Digester

Number of Digesters	#	4
Working Volume of each	gal	
Tank Height	ft	20
Liquid Height	ft	
Internal Diameter	ft	
Type of Roof - (floating, fixed, steel, concrete, membrane, etc.)		Floating
Type of Mixers - (jet, draft tube, pump, etc.)		Any
Number of mixers	#	
Total Solids Content in Digester	%	
Solids Retention Time (SRT)	days	15
Digestate Flow out of Digester	gal/day	
Digestate Ammonia Concentration	mg-N/L	
Volatile Solids Reduction	%	56
Digester Temperature	°F	95
Biogas Flow	scfm	
CH_4 Content in Biogas	%	

Dewatering

Type of Dewatering Process (belt, screw, drum, centrifuge, etc.)		
Number of Dewatering Units	#	
Cake Produced	TPD	
Total Solids Content of Cake	%	
Dewatering Hydraulic Capacity per Unit	gal/day	
Dewatering Solids Capacity per Unit	lb-TSS/hr	
Operating Hours	hour/day	
Operating Days	days/week	
Polymer Usage (or dose)	lb-active /day	
Polymer Cost	$/lb-active	

Solids Management

Process for Managing Cake (hauled, drying bed, dryer, etc.)		
If managed onsite, capacity	ton/day	
Biosolids Disposal Cost	$/ton	
Class A or B Currently	A / B	
Class A Desired?	Y / N	

Side Stream

Centrate/Filtrate Flow	GPD	
Ammonia Concentration	mg-N/L	
Current Effluent Ammonia Concentration	mg-N/L	
Effluent Ammonia Discharge Limit	mg-N/L	

Biogas Equipment

Type of Biogas Treatment (H2S, VOC, Siloxane, Moisture)		
Capacity of Biogas Treatment	scfm	
Type of CHP, Engine, or Turbine		
Number of units	#	
Electrical Capacity of Each Unit	MW	

WWTP Capacity & Power Demand

Flow	MGD	
Average Plant Electrical Demand	MW	
Peak Plant Heating Demand - (building & equipment)	MMBTU/hr	
Power Cost	$/kWh	

Drying

Quantity of Cake to Dryer	TPD	
Quantity of pellets made	TPD	
Capacity of dryer	TPH	
Operating schedule of dryer	hr/d & d/wk	
Heat demand for dryer	MMBTU/hr	
Type of heat for dryer	ie Natural Gas	

Note: Where possible, data is preferred as average values over an extended duration to reflect typical conditions

Anaergia Services, LLC
5780 Fleet Street, Suite 310, Carlsbad, CA 92008
760-436-8870

Stacy McCamey

Subject: FW: Possible new drying opportunity

Begin forwarded message:

From: Tarn Victor <tarnvictor@jbiwater.com>
Date: September 16, 2019 at 4:10:17 PM PDT
To: Andy Komor <akomor@pacewater.com>
Subject: Re: Possible new drying opportunity

Let's talk to him in Chicago.

Tarn Victor
JBI Water & Wastewater
949-302-6622

Sent from my iPhone

On Sep 16, 2019, at 3:25 PM, Andy Komor <akomor@pacewater.com> wrote:

Beautiful, only need screw press and dryer!

Andy

Andy Komor, MS, PE
Vice President, Environmental Water Division
D (714) 481-7225 | C (714) 514-8919
vcard | email | website

PACE | Advanced Water Engineering
<image001.png><image002.png><image003.png><image004.png><image005.png>
Fountain Valley, CA • Scottsdale, AZ • Beijing, China

30 Years of Innovation Since 1987

From: Tarn Victor <tarnvictor@jbiwater.com>
Sent: Monday, September 16, 2019 3:01 PM
To: Andy Komor <akomor@pacewater.com>
Subject: Possible new drying opportunity

Andy,

Here is what we would need to dry properly. See below. What do you think?

T

From: Tid Griffin <tid@2gryphon.com>
Date: Monday, September 16, 2019 at 9:17 AM
To: Tarn Victor <tarnvictor@jbiwater.com>
Subject: Re: Possible new drying opportunity

I would assume it is dewatered, correct? As long as it is dewatered to at least 14-15% TS, we will be able to dry it to their desired Class A specifications.

Tid Griffin
President
Gryphon Environmental
270-485-2680
www.2gryphon.com

From: Tarn Victor <tarnvictor@jbiwater.com>
Date: Monday, September 16, 2019 at 11:02 AM
To: "tidgriffin@gryphonenvironmental.com" <tidgriffin@gryphonenvironmental.com>
Subject: Possible new drying opportunity

Tid,

Looking forward to seeing you in Chicago. I have a possible new opportunity in Escalon, CA. I say possible because we are trying to make the case for drying through either a digested product or an undigested, thickened product. On the digested side, we are pushing to use a high solids digester and take the gas from the process to heat the dryer. They are concerned it may be too expensive for this owner and wondered if we could achieve 90% dry solids using a thickened primary and secondary sludge combination.

I know we need a reasonably conditioned sludge in order to actually dry using our system. What will the parameters have to be to allow us to put dryable sludge on the belt? I am concerned if will be too thin but wondered what experience we have here.

T

Tarn Victor
JBI Water & Wastewater
(949) 302-6622
www.jbiwater.com

APPENDIX G

Regional Board Permit and CDO

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

10 December 2014

Tammy Alcantor
City Manager
City of Escalon
2060 Mc Henry Avenue
Escalon, CA 95320

CERTIFIED MAIL
7013 2250 0000 3465 4439

CEASE AND DESIST ORDER R5-2014-0156, CITY OF ESCALON, SAN JOAQUIN COUNTY, FOR VIOLATIONS OF WASTE DISCHARGE REQUIREMENTS ORDER 5-00-142

Enclosed is the signed Cease and Desist Order R5-2014-0156 that was adopted by the Central Valley Regional Water Quality Control Board on 5 December 2014. This Order was prepared to address violations of the Waste Discharge Requirements Order 5-00-142 as documented in the 24 September 2014 Notice of Violation. Specifically, this Order requires the Discharger to do the following:

• **Immediately** - The Discharger shall submit monitoring reports that contain all the information required by Monitoring and Reporting Program 5-00-142 (or subsequent revision).

• **Immediately** - The Discharger shall submit daily (Monday - Friday) freeboard monitoring results each Friday by e-mail until the CDO is rescinded or the Executive Officer approves the discontinuance of the reporting.

• **Submit reports as outlined in the CDO.** The due dates contained in the CDO are summarized in the table below. To comply with the Order, each report must be submitted complete and on time to avoid further enforcement action. However, to expedite compliance with the CDO, reports may be submitted earlier.

Report Submittal Summary Table

Report Type:	Date Due:
Freeboard Monitoring Reports	**12 December 2014 and continuing weekly**
Contingency Plan for Managing Influent Flows	**31 December 2014**
Food Processing Waste Loading Technical Report	**15 January 2015**
Odor Identification and Mitigation Plan	**15 February 2015**
Vegetation and Rodent Control Plan	**15 February 2015**
Pond Berm Study	**15 February 2015**
Evaluation of Domestic and Industrial Influent Flows	**1 April 2015**

Report Submittal Summary Table (cont.)

Report Type:	Date Due:
Continuous Odor Monitoring System Installation Certification	**15 June 2015**
Food Processing Waste Upgrades Report	**15 June 2015**
Pond Study Corrective Action Report	**15 June 2015**
Odor Monitoring Reports	**10 July 2015 and continuing monthly**
Water Balance	**15 July 2015**
Wastewater Pond As-built Drawings	**15 July 2015**

If the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement or may issue a complaint for administrative civil liability of up to $10,000 per violation, per day.

Electronic Report Submittal:
As described in the Executive Officer's letter of 22 September 2014, we are transitioning to a paperless office. Therefore, please convert all monitoring and technical reports to a pdf and email it to centralvalleysacramento@waterboards.ca.gov. To ensure that your submittal is routed to the appropriate staff as quickly as possible, please include the following information in the body of the email: Attention: Brendan Kenny, Compliance Section, Waste Discharge to Land Unit. In addition, please include the Discharger name, facility name, county, and CIWQS place ID (222916) in the body of the email (this information was provided to you in the 22 September 2014 letter).

If you have any questions, please contact Brendan Kenny at (916) 464-4635 or by e-mail at bkenny@waterboards.ca.gov.

Howard Hold

HOWARD HOLD, P.G.
Senior Engineering Geologist
WDRs Compliance and Enforcement Unit

Enclosure: Cease and Desist Order R5-2014-0156

cc w/o enc: David Boyers, Office of Enforcement, State Water Board, Sacramento
Rodney Estrada, San Joaquin Environmental Health Department, Stockton
Craig Mitchell, San Joaquin Valley Air District, Modesto

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2014-0156

CEASE AND DESIST ORDER
FOR
CITY OF ESCALON
ESCALON WASTEWATER TREATMENT PLAN
SAN JOAQUIN COUNTY

TO CEASE AND DESIST
FROM DISCHARGING CONTRARY TO REQUIREMENTS

The Regional Water Quality Control Board, Central Valley Region, (hereafter referred to as Central Valley Water Board or Board) finds that:

1. Waste Discharge Requirements (WDRs) Order No. 5-00-142, adopted by the Board on 16 May 2000, prescribes requirements for the domestic and industrial wastewater treatment plant owned and operated by the City of Escalon (hereafter referred to as Discharger).

2. The City of Escalon Wastewater Treatment Plant (WWTP) is in San Joaquin County in Sections 17 and 20, T2S, R9E, MDB&M, at 25100 East River Road. The facility is on Assessor's Parcel Numbers 247-090-36 and 247-090-38. Both parcels are owned by the City of Escalon.

WASTEWATER TREATMENT PLANT

3. The WWTP is on the north side of the Stanislaus River. Surrounding land uses are primarily agricultural. A golf course country club and residential development (Del Rio) are on the south side of the Stanislaus River, and approximately one quarter mile south of the WWTP. The dominate wind direction is towards the south, from the WWTP toward Del Rio.

4. The WWTP treats industrial wastewater generated by two food processing industries and domestic wastewater generated by the City of Escalon. The treatment process consists of screening and discharge to mechanically aerated treatment ponds, followed by discharge to evaporation/percolation ponds. The industrial and domestic wastewater flows are delivered to the plant in separate pipelines. The two waste streams remain separate and are treated, stored and disposed of in separate percolation and evaporation ponds. Stormwater from a limited portion of the City of Escalon is also piped to the facility and discharged to the industrial ponds.

5. Industrial dischargers consist of a tomato canner and a frozen pepper processor. Industrial wastewater is characterized by high concentrations of biological oxygen demand. The industrial dischargers' processing season is from approximately May through December.

6. The Discharger treats industrial wastewater in four aerated treatment ponds, followed by discharge to seven evaporation/percolation ponds. The Discharger treats domestic wastewater in five aerated treatment ponds, followed by discharge into four evaporation/percolation ponds. The 20 ponds are generally rectangular in shape, vary in size from about 1 acre to 5.6 acres, and are about 3 feet to 9 feet deep.

7. The Discharger allows the industrial wastewater ponds to dry completely prior to initiation of the industrial wastewater generation season. Annually, the ponds are disked and ripped to maintain percolation rates.

8. Based on groundwater monitoring performed at the site, groundwater exists approximately 37 feet below ground surface. Groundwater flows to the west-southwest, toward the Stanislaus River.

PREVIOUS ENFORCEMENT

9. Objectionable odor complaints related to the facility were documented in July and August 2000, August 2001, June and July 2002, and July and August 2003.

10. Cease and Desist Order R5-2003-0124, adopted by the Board on 5 September 2003, provided the Discharger with a time schedule to (a) evaluate organic loading and pH ranges that the WWTF was capable of treating in a manner that protects water quality and prevents nuisance odors, (b) implement an enhanced industrial pretreatment program with loading limits within the WWTF's treatment capacity, (c) implement a preseason startup program to limit the potential for odor generation and (d) submit a technical report describing the physical and management changes implemented to meet the appropriate organic loading and pH ranges for the WWTF.

11. Improvements to the industrial pretreatment programs at the food processing facilities included enhanced solids screening and installation of dissolved air floatation units. Improvements to the wastewater treatment facility included additional pond aerators and installation of an oxygen injection system for industrial ponds 2 and 3. The Discharger also updated its industrial pre-treatment program.

12. The Discharger completed the required tasks and Order R5-2003-0124 was rescinded on 2 December 2011.

VIOLATIONS OF WASTE DISCHARGE REQUIREMENTS

Effluent Violations

13. Discharge Specifications B.4 and B.5 of the WDRs establishes a Biochemical Oxygen Demand (BOD) industrial wastewater effluent limit of 150 milligrams per liter (mg/l) as a monthly average and a domestic wastewater BOD effluent limit of 80 mg/l as a daily maximum.

14. On 4 June 2014, Board staff issued a Notice of Violation to the Discharger for exceeding the effluent limits for BOD in the industrial and domestic wastewater ponds during a portion of the 2013 food processing season (i.e., August, September and October 2013). The Discharger responded by letter on 5 August 2014 describing the steps it had taken to eliminate the violations, and stating that it would increase the BOD monitoring from monthly to bi-monthly in order to react more quickly should violations arise in the future. However, the Discharger has not increased its BOD monitoring.

15. During preparation of this Order, the Discharger stated that the industrial effluent BOD violations noted in the NOV were in error because the BOD samples were collected in the wrong location. Staff's re-review of the August 2013-October 2013 monitoring reports show that the Discharger did not collect BOD samples from every industrial percolation pond, in violation of the WDRs. Therefore, it is not possible to determine whether or not the Discharger complied with the industrial BOD effluent limit.

16. Board staff has reviewed monitoring data submitted for the period of May through September 2014. The Discharger failed to collect BOD samples from every industrial percolation pond, in violation of the WDRs. Therefore, it is not possible to determine whether or not the Discharger complied with the industrial BOD effluent limit.

17. This Order requires that the Discharger investigate the cause of the effluent violations and determine if the violations are due to inadequate pretreatment at the food processing facilities, inadequate treatment at the WWTF, inadequate monitoring at the WWTP, or a combination. This Order also requires the Discharger to make operational and mechanical improvements, as necessary, to comply with the effluent limits in the WDRs, and to ensure that future monitoring reports contain all information required by the WDRs.

Odor Violations

18. Discharge Specification No. B.6 of the WDRs states, "*Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment facility.*"

19. Discharge Specification No. B.7 states, "*As a means of discerning compliance with Discharge Specification B.6, the dissolved oxygen content shall not be less than 1.0 mg/l in any pond at any time....*" The Monitoring and Reporting Program requires that dissolved oxygen be measured in every pond (both domestic and industrial) on a weekly basis.

20. On 5 August 2014, Board staff received an odor complaint from a resident in the Del Rio subdivision. Board staff contacted the Discharger, who responded that the facility was maintaining compliance with the WDRs and that the San Joaquin Valley Unified Air Pollution Control District (Air District) had been out to the facility, but unable to confirm the complaint.

21. Between 6 August and 13 September 2014, Board staff received four additional complaints related to odors from the WWTF. On 17 September 2014, Board staff inspected the WWTF in response to the odor complaints. Odors associated with wastewater were observed in the vicinity of industrial wastewater ponds 14 and 15.

22. Between 19 July and 6 October 2014, the Air District received 59 odor complaints associated with the WWTF. Of the 59 complaints, 20 were confirmed by the Air District[1]. On 29 September 2014, the Air District issued a Notice of Violation to the Discharger, which states in part: "*...Facility discharged an odor that was a nuisance and annoyance to a considerable number of persons.*"

23. Board staff received additional odor complaints on 7, 8, and 9 October 2014.

24. A review of monitoring reports from August-October 2013 and from May-September 2014 shows that the Discharger only measured dissolved oxygen concentrations in the treatment ponds, but not in the percolation ponds. The lack of dissolved oxygen monitoring prevented the Discharger from determining whether there were potential odor issues, and if so, adequately responding to them.

25. This Order requires the Discharger to address the odor issues by evaluating the industrial pretreatment programs and seasonal startup procedures at the industrial facilities and the WWTP. Additionally, this Order requires the Discharger to evaluate whether facility improvements are necessary to meet the effluent limits and conditions in the WDRs, to conduct real time odor monitoring during the 2015 processing season, and to complete all of the monitoring required by the WDRs.

Capacity Violations

26. WDRs Discharge Specification B.11 states, *"Pond freeboard shall never be less than two feet in any pond as measured vertically from the water surface to the upper surface of the lowest adjacent dike or levee."* The Monitoring and Reporting Program requires that freeboard measurements be measured in every pond (both domestic and industrial) on a weekly basis.

27. Standard Provisions and Reporting Requirements for Waste Discharge Requirements (Standard Provisions) Provision B. 1 states, *"In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Board by telephone as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of noncompliance, and shall include a timetable for*

[1] A "confirmed complaint" means that an Air District employee or reliable complainant is able to testify that a particular operation is the source of the air contaminants. Confirmation may be accomplished when Air District staff meet with a complainant and the parties trace the odor to the alleged source; a reliable complainant makes confirmation; or the identification of air contaminants is supported by data operational records, wind charts, and monitoring devices. (San Joaquin Valley Unified Air Pollution Control District Compliance Department, Com 1140, 8 February 2007).

corrective actions."

28. During staff's 17 September 2014 inspection, staff observed inadequate freeboard levels in every industrial wastewater disposal pond (Ponds 10 through 16). Freeboard was generally less than 2 inches. Interior berms which separate the ponds were saturated and partially submerged below the water surface. Staff also observed inadequate freeboard levels in every domestic wastewater disposal pond (Ponds 20 through 24). For these ponds, freeboard was generally less than 6 inches. The failure to maintain two feet of freeboard is a violation of Discharge Specification B.11.

29. It is unknown how long the Discharger was in violation of the freeboard requirement. A review of the monthly monitoring reports from August 2013 through mid-September 2014 shows that the Discharger failed to submit freeboard measurements for any of the ponds, in violation of the WDRs. The Discharger also failed to verbally notify staff of the freeboard violations, in violation of Standard Provision B.1. In addition, the Discharger states that it is unable to provide freeboard logs prior to 19 September 2014 because the previous treatment plant operator is no longer employed by the City and the City is unable to find the information.

30. This Order requires the Discharger to address the continuing capacity violations by evaluating influent wastewater flows, the facility's flow monitoring system, and the storage and disposal capacity of the domestic and industrial wastewater pond system. In addition, this Order requires the Discharger to conduct daily freeboard monitoring and inspections, and to continue to report the results to the Board.

Discharge Violations

31. WDRs Prohibition A.1 states *"Discharge of wastes to surface water drainage courses is prohibited."*

32. WDRs Prohibition A.2 states *"Bypass or overflow of untreated or partially treated waste is prohibited."*

33. Standard Provision A.7 states *"The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements."*

34. Discharge Specification B.1 states "*For the domestic WWTP, the monthly average dry weather flow shall not exceed 0.90 mgd. The maximum daily flow shall not exceed 1.0 mgd."*

35. On 17 September 2014, at approximately 2:20 p.m. the wastewater treatment facility operator informed Board staff by telephone that wastewater was observed seeping from a rodent hole within the berm separating industrial wastewater pond 12 from the Stanislaus River. The Discharger stopped the discharge sometime between 9:30 and 11:30 p.m. by placing several yards of a mixture soil and bentonite clay mixture on the inner berm of pond 12. The operator estimated a flow rate between two to five gallons

per minute to the Stanislaus River, and a total discharge of 2,700 gallons[2]. This discharge and failure to maintain the pond berm is a violation of Prohibitions A.1 and A.2, and Provision A.7.

36. On 19 September 2014, Board staff requested that the Discharger implement daily monitoring and reporting of influent flows and pond freeboard. Additionally, staff requested that the Discharger conduct daily inspections of all wastewater pond berms.

37. On 20 September 2014, as part of the daily monitoring program, the Discharger notified Board staff that the internal levee separating industrial ponds 11 and 16 was leaking. The leak was occurring through a rodent hole in the levee. All wastewater was contained in the wastewater ponds. The failure to maintain the wastewater pond berms is a violation of Standard Provision A.7. This Order requires the Discharger to implement a rodent control program.

38. On 24 September 2014, Board staff issued a Notice of Violation (NOV) to the Discharger for violations observed during staff's inspection and for the unauthorized discharge to the Stanislaus River. The NOV requires the Discharger to submit a technical report prepared by a California licensed Engineer that contains the following items:
    - An evaluation of domestic and industrial influent flows into the facility for the 2013 and 2014 processing season.
    - An evaluation of the wastewater pond berm system berms and a water balance demonstrating whether or not the ponds have adequate storage and disposal capacity.
    - A plan to manage influent flows during the winter and spring of 2014 and 2015. such that two feet of freeboard is maintained in a wastewater ponds.
    - A pond vegetation monitoring and removal plan.
    - An odor identification and mitigation plan.
    - A copy of the City's industrial discharge permits for both the tomato processing facility and the pepper processing facility.
    - The name of the licensed engineer the Discharger has retained to evaluate the industrial pretreatment program.

    The NOV required that the work be completed by 31 October 2014. The City responded to the NOV on 8 October 2014. The response included workplans and implementation schedules to evaluate the wastewater pond berms, capacity, and odor issues. Additionally, the response asked for an extension for some of the tasks to 31 December 2014. This Order allows for the extension.

[2] The Discharger does not know when the discharge began, so this volume is an estimate of the volume discharged between the time of discovery and the time of cessation of discharge. The actual volume discharged is greater than 2,700 gallons, but the amount is unknown at this time.

39. On 7 October 2014, Board staff was informed that the Discharger had purchased a new dissolved oxygen meter as readings from the previous meter may be incorrect. Additionally, the Discharger is in the process of performing repairs to the WWTF oxygen injection system for industrial wastewater ponds 2 and 3. The failure to adequately maintain the dissolved oxygen meter and the oxygen injection system is a violation of Standard Provision A.7, which states *"The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements."*

40. On 11 October 2014, the treatment plant operator notified Water Board staff that domestic influent wastewater flows exceeded the discharge limit of 1.0 million gallons per day (mgd) on October 6th. The flow on that day was 1.263 mgd, which is a violation of Discharge Specification B.1 of Order 5-00-142. Flows were also higher than normal on October 5th, but did not exceed the flow limit. Staff's review of the monitoring reports show that the maximum daily influent flow was also exceeded in September 2013. This Order requires an investigation into the source of the high inflow into the domestic WWTP.

Short Term Corrective Actions

41. On 17 September 2014, the Discharger requested that the tomato processor and pepper processor reduce wastewater generation rates. Daily wastewater flow data submitted by the Discharger shows that the combined industrial flows have been reduced from approximately 2.7 million gallons a day (mgd) to 1.7 mgd within a few days after the request. Daily flow and freeboard logs submitted by the Discharger show that freeboard levels in the ponds have increased slightly. However, the freeboard levels in a number of the ponds remains below 10 inches, in violation of the WDR requirement of 24 inches of freeboard.

42. On 24 September 2014, the Discharger submitted an interim wastewater disposal plan. Approximately 100,000 gallons per day of pretreated industrial wastewater would be sent to the City of Manteca WWTF for final disposal (pending Manteca's approval). The agreement would be valid through 31 October 2014. Board staff approved the emergency plan on 25 September 2014. The City began off-hauling treated industrial wastewater on 21 October 2014 and will cease off-hauling on 31 October 2014.

43. On 8 October 2014, the Discharger informed Board staff that odor absorbents and masking agents have been placed along the fence line of the WWTF.

REGULATORY CONSIDERATIONS

44. As a result of the events and activities described in this Order, the Regional Board finds that the Discharger has caused or permitted waste to be discharged in such a manner that it has created, and continues to threaten to create, a condition of pollution

or nuisance. The Regional Board also finds that the Discharger is discharging waste in violation of WDRs Order No. 5-00-142, as described in the Findings of this Order.

45. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (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 Board. These requirements implement the Basin Plan.

46. The WWTF is adjacent to the Stanislaus River. Surface water drainage is to the Stanislaus River. As described in the Basin Plan, the beneficial uses of the Stanislaus River are municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, migration of aquatic organisms, spawning, reproduction, and/or early development, and wildlife habitat.

47. The beneficial uses of the underlying groundwater, as specified in the Basin Plan are municipal, domestic, and industrial supply.

48. Section 13050(m) of the California Water Code defines "nuisance" as anything which meets the following requirements:
    (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
    (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
    (3) Occurs during, or as a result of, the treatment or disposal of wastes.

49. Section 13301 of the California Water Code states in part: *"When a Regional Board finds that a discharge of waste is taking place or threatening to take place in violation of the requirements or discharge prohibitions prescribed by the regional board or the state board, the board may issue an order to cease and desist and direct that those persons not complying with the requirements or discharge prohibitions (a) comply forthwith, (b) comply in accordance with a time schedule set by the board, or (c) in the event of a threatened violation, take appropriate remedial or preventive action."*

50. Section 13267(b) of the California Water Code states: *"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 waste within its region, or any citizen or domiciliary, or political agency or entity of this state person 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 waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report*

and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."

51. The technical reports required by this Order are necessary to ensure compliance with this Order and WDRs Order 5-00-142, and to ensure the protection of water quality. The City of Escalon owns and operates the facility that discharges waste subject to this Order and WDRs Order 5-00-142.

52. The issuance of this Order is being taken for the protection of the environment and as such is exempt from provisions of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) pursuant to California Code of Regulations, title 14, sections 15061 subdivision (b)(3), 15306, 15307, 15308, and 15321subdivision (a)(2).

53. On 5 December 2014, in Rancho Cordova, California, after due notice to the Discharger and all other affected persons, the Central Valley Water Board conducted a public hearing at which evidence was received to consider a Cease and Desist Order under Water Code section 13301 to establish a time schedule to achieve compliance with waste discharge requirements.

IT IS HEREBY ORDERED that, pursuant to Water Code Sections 13301 and 13267, the City of Escalon shall implement the following measures in order to comply with WDRs Order 5-00-142.

This Order requires submittal of technical reports. These technical reports shall contain the information and decisions required by the following paragraphs. If a report is submitted without the required information or decision, then the Discharger is in violation of this Order and subject to additional enforcement action.

The Board is transitioning to a paperless office. Therefore, all technical reports required by this Order must be converted to a searchable pdf file and emailed to centralvalleysacramento@waterboards.ca.gov . The following information shall be included in the body of the email: Attention Brendan Kenny, Compliance Section, Waste Discharge to Land Unit. In addition, include the Discharger name, facility name, county, and CIWQS place ID (222916) in the body of the email.

1. **Effective immediately**, the Discharger shall submit monitoring reports that contain all the information required by Monitoring and Reporting Program 5-00-142 (or subsequent revision).

Odor Mitigation and Wastewater Treatment Evaluation

2. By **15 February 2015** the Discharger shall submit an *Odor Identification and Mitigation Plan* for review and approval. The plan shall describe how the wastewater treatment

plant and Del Rio subdivision will be continuously monitored using real time sensors, such as the Odowatch© (or similar system for odor monitoring) to identify the presence of nuisance odors associated with wastewater treatment and disposal. At least one sensor shall be installed within the Del Rio subdivision. The plan must also include notification and corrective action procedures for the City and WWTF staff to follow when odors are identified.

3. By **15 January 2015**, the Discharger shall submit a *Food Processing Waste Loading* technical report that (a) evaluates the organic loading and pH ranges which the City's industrial wastewater treatment plant is capable of treating while meeting the effluent limits and conditions specified in the WDRs, and (b) describes the actions needed to ensure that the tomato processing facility and the pepper processing facility comply with the influent loading limits. This second item shall include an evaluation of best practical treatment and control options including but not limited to: operating at a reduced organic loading rate, load checking, additional screening, pretreatment options including BOD reduction at the industrial facility, segregation of high strength waste streams, and changes to the waste characteristics as it is conveyed from the industrial facilities to the treatment plant. The report shall include recommendations and a construction schedule for upgrades to the individual food processing facilities and the WWTF to comply with effluent limits in the WDRs. All upgrades shall be completed prior to the 2015 processing season.

4. By **1 April 2015**, the Discharger shall submit an evaluation of the 2013 and 2014 domestic and industrial influent flows. The evaluation shall identify any flow violations, cite the cause of the violations, and include a description of corrective actions the City has implemented to prevent future flow violations. For the industrial flows, the City shall evaluate whether increased flows in 2014 were a partial cause of the lack of capacity and odor violations.

5. By **15 June 2015**, the Discharger shall submit a report certifying that a real time continuous odor monitoring system has been installed in accordance with the approved *Odor Identification and Mitigation Plan.*

6. Beginning **10 July 2015**, the Discharger shall submit monthly *Odor Monitoring Reports* that include odor plume concentration maps. Each report shall cover the previous month, and shall include odor plume maps and a discussion of WWTP-derived odors in the Del Rio subdivision. The reports shall be submitted until this Order is rescinded or the Executive Officer determines that they are no longer necessary.

7. By **15 June 2015**, the Discharger shall submit a *Food Processing Waste Upgrades Report of Results* describing in detail the physical and management changes that have been implemented at (a) the tomato processing facility, (b) the pepper processing facility, and (c) the City wastewater treatment plant in response to the recommendations in the *Food Processing Waste Loading Report.* The *Report of Results* shall discuss changes to the pretreatment program, improvements at the

WWTF, and processing season startup procedures to limit the potential for odor generation.

Wastewater Treatment Plant

8. **Effectively immediately**, the Discharger shall conduct daily freeboard monitoring and inspections, and continue to report the results daily to the Board via email. However, effective after freeboard levels in all wastewater ponds (domestic and industrial) meet the two foot requirement for seven consecutive days, the Discharger may reduce the freeboard monitoring to a Monday through Friday basis, and report the results each Friday by email. This requirement shall continue until this Order is rescinded or the Executive Officer approves the discontinuance of the reporting.

9. By **31 December 2014**, the Discharger shall submit and implement a contingency plan for managing influent flows during the 2014/2015 winter and spring while maintaining compliance with the WDRs.

10. By **15 February 2015,** the Discharger shall submit and implement a *Vegetation and Rodent Control Plan.*

11. By **15 February 2015**, the Discharger shall submit and implement a *Pond Berm Study Report* with recommendations and a construction schedule for completing repairs and improvements as necessary to stop seepage from the berms, including Pond 12, Ponds 11/16, Pond 24 and any additional ponds where seepage is identified. The report shall include the items listed in the 2 October 2014 Wallace Kuhl and Associates workplan. Additionally, the report shall evaluate the entire wastewater pond berm system and include recommendations as to repair or other actions necessary to preclude the possibility of additional pond berm failures.

12. By **15 July 2015**, the Discharger shall submit a water balance demonstrating whether or not the ponds have adequate storage and disposal capacity. The report shall include recommendations as needed to repair/restore berm integrity and capacity such that the WWTF can comply with Discharge Specification B. 10 of the WDRs. If there is not enough capacity, then the Discharger shall submit plans to either obtain sufficient capacity or reduce flows to the current capacity of the treatment plant.

    The *Water Balance Report* shall be prepared by or under the supervision of a California Registered Engineer, and signed/stamped by the registered engineer. The water balance shall include:

    - Rainfall based on the 100-year return period total annual precipitation and the average annual precipitation as reported by the California Department of Water

Resources in its Depth-Duration-Frequency Tables for the Escalon Station (or other station approved by staff).[1]

- Return period ratio calculated from the abovementioned 100-year return period total annual precipitation, which is divided by the average annual precipitation for the approved Station.
- Rainfall distributed over the months of the year using the approved station's monthly average precipitation multiplied by the return period ratio.
- The monthly evaporation, precipitation, and percolation rates, including contributions from major sources such as infiltration and inflows, and storm water run-on.
- Current influent flows and permitted influent flows (if different).

13. By **15 June 2015**, the Discharger shall submit a report certifying that the corrective actions identified in the Pond Study have been implemented. As built drawings for the wastewater pond system shall be submitted to the Regional Board by **15 July 2015.**

Other Requirements

14. As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California Registered Engineer or Professional Geologist and signed by the registered professional. Each technical report submitted by the Discharger shall contain the professional's signature and/or stamp of the seal.

15. As required by Provision F.6, of WDRs Order 5-00-142 and General Reporting Requirement B.3 of Standard Provisions and Reporting Requirements For Waste Discharge Requirements, all reports and transmittal letters shall be signed by either a principal executive officer of the corporation with at least the level of senior vice-president or a duly authorized representative in accordance with the WDRs, and any person signing a document submitted to comply with this Order shall make the following certification:

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

16. If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney

[1] The California Department of Water Resources' station index and Depth-Duration-Frequency tables are available at the website: ftp://ftp.water.ca.gov/users/dfmhydro/Rainfall%20Dept-Duration-Frequency/Rain%20D%20DDF%20Daily/.

General for judicial enforcement or may issue a complaint for administrative civil liability.

17. Failure to comply with this Order or with the WDRs may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

18. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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 December 2014.

Pamela C Creedon

PAMELA C. CREEDON, Executive Officer

12/5/2014

(Date)

BK/HDH/WSW: 9-Dec-14

California Regional Water Quality Control Board

Central Valley Region

Steven T. Butler, Chair

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

Sacramento Main Office
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21 June 2000

CERTIFIED MAIL
7099 3220 0005 3846 4110
Mr. Doug Stidham, City Engineer
City of Escalon
1854 Main Street
Escalon, CA 95320

NOTICE OF ADOPTION OF REVISED WASTE DISCHARGE REQUIREMENTS FOR CITY OF ESCALON, ESCALON WASTEWATER TREATMENT PLANT, SAN JOAQUIN COUNTY

Waste Discharge Requirements (WDRs) Order No. 5-00-142 for the Escalon Wastewater Treatment Plant was adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 16 June 2000 meeting.

Please note that a technical report is required **15 days** prior to increasing flow rates based on the wastewater treatment plant improvements, and an evaluation report on reduction, reuse, and recycling opportunities is required by **1 January 2001**, in addition, a sludge management plan is required by **1 January 2001**. Please refer to the attached WDRs and Standard Provisions for additional requirements and information.

If you have any questions, please call Tim O'Brien at (916) 255-3116.

Wendy Wyels

WENDY S. WYELS, Chief
Waste Discharge to Land Unit
Lower San Joaquin River Watershed

Enclosures - Adopted Order
Standard Provisions (discharger only)

cc: See Attached List

cc: Frances McChesney, Office of Chief Counsel, State Water Resources Control Board, Sacramento
John Youngerman, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Fish and Game, Region II, Rancho Cordova
Jerry Boles, Department of Water Resources, Red Bluff
San Joaquin County Planning Department, Stockton
Mike Huggins, San Joaquin County Environmental Health Department, Stockton
Joseph Spano, Department of Health Services, Office of Drinking Water, Stockton
Blake Tresan, Nolte and Associates, Inc., Sacramento
Leland McPherrin, Escalon Premier Brands, Escalon
Pete Thompson, Eckert Cold Storage, Escalon

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 5-00-142

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF ESCALON
ESCALON WASTEWATER TREATMENT PLANT
SAN JOAQUIN COUNTY

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

1. The City of Escalon (hereafter Discharger) submitted a Report of Waste Discharge, dated 29 February 2000, and supplemental information dated 30 March 2000, for an expansion of the industrial portion of its wastewater treatment plant (WWTP).

2. The wastewater treatment facility is at 25100 West River Road, Escalon, in Sections 17 and 20, T2S, R9E, MDB&M, as shown in Attachment A, which is attached hereto and made part of this Order by reference. The facility is on Assessor's Parcel Numbers 247-090-36 and 247-090-38, which are both owned by the City of Escalon.

3. Waste Discharge Requirements Order No. 95-170, adopted by the Board on 23 June 1995, prescribes requirements for discharge of treated effluent from the City of Escalon WWTP to evaporation and percolation ponds on the property. Because of increased flows to the WWTP, and facility improvements at the site, Order No. 95-170 is not adequate and requires amendment.

4. The WWTP treats industrial wastewater generated by vegetable processing industries and domestic wastewater generated by the City of Escalon. The treatment process consists of screening and discharge to mechanically aerated treatment ponds, followed by discharge to evaporation/percolation ponds. The ponds, and proposed improvements, are shown in Attachment B, which is attached hereto and made part of this Order by reference.

5. The industrial and domestic wastewater flows are delivered to the plant in separate pipes, are treated in separate ponds, and are discharged to separate evaporation/percolation ponds. Stormwater from a limited portion of the City of Escalon is piped to the facility and is discharged to the industrial ponds.

6. The Discharger treats domestic wastewater in five treatment ponds, all of which are mechanically aerated. The domestic wastewater is disposed in two evaporation/percolation ponds (Nos. 21 and 24). Pond No. 21 provides 4.4 acres of surface area and 11.3 million gallons of storage capacity. Pond No. 24 provides 4.7 acres of surface area and 11.1 million gallons of storage capacity.

7. Prior to recent upgrades, the treatment plant was designed to treat domestic wastewater average dry weather flows of up to 0.55 million gallons per day (mgd) and peak wet weather flows of 1.0 mgd.

8. A report prepared by Dewante and Stowell titled, "*Wastewater Treatment Facilities Improvement and Expansion*," dated April 1990, identified improvements at the WWTP that could increase capacity and treatment. Improvements that were implemented included construction of Pond Nos. 21 and 24, addition of mechanical aeration, and piping improvements. The improvements resulted in additional storage capacity of 22.4 million gallons and 9.1 acres of surface area to the existing domestic wastewater treatment system. Based on the information in the Dewante and Stowell report, the domestic wastewater treatment facility is designed to treat 0.90 million gallons a day.

9. The Discharger does not disinfect effluent prior to discharge to the evaporation/percolation ponds.

10. The Discharger treats industrial wastewater in four treatment ponds, all of which are mechanically aerated. The industrial wastewater is then discharged to ten evaporation/percolation ponds (Nos. 10 through 19). The approximate surface area and storage capacity is presented below:

Pond Number	Surface Area (acres)	Storage Capacity (millions of gallons)
1	2.8	5.4
2	1.7	1.7
3	1.8	1.8
4	2.3	3.0
10	1.1	2.2
11	2.1	6.1
12	1.8	4.7
13	1.8	2.8
14	1.3	2.0
15	1.0	1.5
16	2.1	2.7
17	2.9	3.7
18	2.7	3.3
19	2.7	3.3
Totals	28.1	44.2

Data from City of Escalon, *Treatment Plant Storage Map*, dated 1/17/97.

11. The treatment plant was designed to treat industrial wastewater average dry weather flows up to 2.0 mgd and peak wet weather flows of 3.0 mgd. The monthly average dry weather maximum industrial flow rate was exceeded in August, 1999; the maximum daily industrial flow rate was exceeded in September and October, 1999.

12. The Discharger allows the industrial wastewater ponds to dry completely prior to initiation of the industrial wastewater generation season. The ponds are disced and ripped annually to maintain percolation rates.

13. Industrial dischargers consist of Escalon Premier Brand (tomato canner) and Eckert Cold Storage (frozen pepper processor). The industrial dischargers' processing season is from approximately May through December. The industrial dischargers presently screen their wastewater to remove solids prior to discharge to the WWTP.

14. Industrial wastewater is characterized by high concentrations of biochemical oxygen demand. The Discharger has not been previously required to analyze for total dissolved solids (TDS) concentrations. Escalon Premier Brands added tomato peeling equipment in 1999 which resulted in additional flow and increased biochemical oxygen demand.

15. Based on the Discharger's self-monitoring data for 1999, the flow rate and biochemical oxygen demand of influent at the WWTP headworks is presented below:

Month	Domestic Wastewater System Flow (mg)	Domestic Wastewater System BOD[1] (mg/l)	Industrial Wastewater System Flow (mg)	Industrial Wastewater System BOD[1] (mg/l)
January 1999	21.2	282	0.75	NA
February 1999	19.2	106	0.21	NA
March 1999	20.1	215	0.25	NA
April 1999	19.5	114	0.15	NA
May 1999	19.4	102	0.60	NA
June 1999	20.4	147	7.54	712
July 1999	20.4	181	42.6	505
August 1999	21.3	105	79.7	610
September 1999	18.6	110	93.3	1,380
October 1999	21.9	131	98.7	750
November 1999	21.2	71	32.4	316
December 1999	21.3	75	5.2	NA

[1] 5-day Biochemical Oxygen Demand.
NA denotes Not Analyzed.
Data from City of Escalon, "*1999 Annual Wastewater Treatment Report*," February 2000.

16. Both industrial dischargers are required to sample their wastewater individually. Flow rates and biochemical oxygen demand data for the 1999 processing season are presented below:

Constituent	Units	Escalon Premier Brand Average/peak	Eckert Cold Storage Average/Peak
BOD_5	mg/l	1,151/1,900	1,214/3,000
Flow Rates			
July 1999	mgd	1.8/2.0	0.5/1.0
August 1999	mgd	2.2/2.3	0.4/0.5
September 1999	mgd	2.5/3.0	0.7/0.9
October 1999	mgd	2.3/2.7	0.7/0.9
November 1999	mgd	2.1/2.3	0.7/0.8

Data from Nolte Report, "*Wastewater Treatment Facilities Improvements*," March 2000.

17. A hydraulic analysis of the industrial wastewater portion of the WWTP presented in the RWD indicates that industrial wastewater flows have reached the WWTP's hydraulic capacity. Reclamation is not presently performed; however, the Discharger is investigating reclamation alternatives.

18. The Discharger is in the process of improving the industrial WWTP. The improvements will provide more capacity and better treatment. Improvements include deepening the existing treatment ponds, three new evaporation/percolation ponds (Nos. 20, 22, and 24), piping and pond configuration improvements, addition of mechanical aerators, and reconfiguration of existing aerators. Pond No. 22 will provide 5.6 acres of surface area and 5.1 million gallons of storage capacity. Pond No. 23 will provide 5.0 acres of surface area and 4.7 million gallons of storage capacity. Pond No. 20 will be constructed as an enlargement of Pond No. 12; Pond No. 12/20 will provide 4.0 acres of surface area and 11.7 million gallons of storage capacity. The construction activities are scheduled to be completed by July 2000, in time for the beginning of the industrial discharger's processing season. A summary of the pond configuration improvements is presented below:

	Pond Area	Pond Volume	Hydraulic Capacity	
Condition/Improvement	Acres	MG	MGD	MG/year
Existing Conditions	19.5	32.3	2.0	221
Recommended Improvements				
Deepen Treatment Ponds	NA	3.1	NR	NR
Expand Pond 12 to Incorporate Pond 20	2.2	7.0	0.27	29
Remove Berm between Ponds 13 and 16	0.3	0.5	0.04	3
Remove Berm between Ponds 14 and 17	0.3	0.5	0.04	3
Remove Berm between Ponds 15 and 18	0.3	0.5	0.04	3
Construct Pond 22	5.6	5.1	0.54	58
Construct Pond 23	5.0	4.7	0.48	52
Subtotal of Improvements	13.7	18.3	1.41	148
Total (Ext. + Rec. Improvements)	33.2	50.6	3.41	370

Data from Nolte Report, "*Wastewater Treatment Facilities Improvements*," March 2000.
MG denotes million gallons. MGD denotes million gallons per day.
NA denotes not applicable. NR denotes not reported.
Ext. + Rec. denotes the sum of existing and recommended improvements.

19. Escalon Premier Brands is in the process of retaining a wastewater engineering firm to identify means to reduce the BOD concentrations of its wastewater and to investigate opportunities for recycling of wastewater at the plant.

20. Three groundwater monitoring wells exist at the facility. The wells are screened in the first saturated interval and are currently sampled annually. Well W-1 is upgradient of the

wastewater treatment ponds; Wells W-2 and W-3 are adjacent to the future Ponds 22 and 23. None of the wells are directly downgradient of the treatment or percolation/evaporation ponds. Based on groundwater samples which were collected from April 1997 to January 2000, average characterization of the water quality is:

Well	Electrical Conductivity	Nitrate (as nitrate)
W-1	780 mg/l	5.4 mg/l[1]
W-2	566.7 mg/l	20.8 mg/l
W-3	785 mg/l	43.1 mg/l

Data from Discharger's self-monitoring reports.
[1] Analytical detection limit used to calculate average value.

21. Based on the groundwater monitoring performed at the site, groundwater exists approximately 37 feet below ground surface. Groundwater flows to the west-southwest.

22. In order to determine compliance with the groundwater and surface water limitations contained herein, these WDRs contain a time schedule for preparation of a groundwater evaluation report.

23. Objectionable odor complaints related to the facility were documented in October 1996, November 1997, and September 1999. All the complaints were related to the industrial wastewater system.

24. The WWTP is on the north side of the Stanislaus River. Surrounding land uses are primarily agricultural. A golf country club and private residences exist south of the Stanislaus River.

25. The Board adopted a Water Quality Control Plan, Fourth Edition, for the Sacramento River and San Joaquin River Basins (hereafter Basin Plan), which designates beneficial uses and water quality objectives for waters of the Basins. These requirements implement the Basin Plan.

26. The site lies within the San Joaquin Valley Floor Hydrologic Unit No. 535.10, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.

27. Surface water drainage is to the Stanislaus River. The beneficial uses of the Stanislaus River are municipal, agricultural water supply for irrigation and stock watering; contact recreation, canoeing, and non-contact recreation; warm and cold freshwater habitat; cold water migration; warm and cold water spawning; and wildlife habitat. The potential beneficial uses of the Stanislaus River are municipal and domestic water supply.

28. The beneficial uses of the underlying groundwater are municipal, domestic, and industrial supply.

29. The Board has considered anti-degradation pursuant to State Board Resolution No 68-16 and finds that not enough data exists to determine whether this discharge is consistent with those provisions. Therefore, this Order provides a timeline for data collection to determine whether the discharge will cause an increase in groundwater constituents above that of background levels. If the discharge is causing such an increase, then the Discharger may be required to cease the discharge, line the ponds, implement source control, change the method of disposal, or take other action to prevent groundwater degradation.

30. The Discharger prepared a Negative Declaration in accordance with the California Environmental Quality Act (Public Resource Code Section 21000 et seq.) and the State CEQA Guidelines. The CEQA document was approved on 9 May 2000 by the City of Escalon City Council.

31. This discharge is exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 2005, et seq., (hereafter Title 27). The exemption pursuant to Section 20090(b), is based on the following:

    a. The Board is issuing waste discharge requirements,
    b. The discharge complies with the Basin Plan, and
    c. The wastewater does not need to be managed according to Title 22 CCR, Division 4.5, and Chapter 11, as a designated or hazardous waste.

32. 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."

33. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

34. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Order No. 95-170 is rescinded and the City of Escalon, its 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:

A. Prohibitions:

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

2. Bypass or overflow of untreated or partially treated waste is prohibited.

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

4. The discharge shall not cause the degradation of any water supply.

5. Discharge of waste classified as hazardous, as defined in Sections 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. For the domestic WWTP, the monthly average dry weather flow shall not exceed 0.90 mgd. The maximum daily flow shall not exceed 1.0 mgd.

2. For the industrial WWTP, the monthly average dry weather flow shall not exceed 2.0 mgd. The maximum daily flow shall not exceed 3.0 mgd. These industrial flow limits will remain in effect until the industrial wastewater treatment facilities improvements are completed, and a technical report (as described in Provision F.1) has been submitted and approved by the Executive Officer. Upon approval of the technical report, the Discharger's flow limits will be allowed as presented in Discharge Specification No. B.3.

3. Upon approval of the technical report required by Provision F.1, flow rates at the industrial WWTP may increase as follows: the monthly average dry weather industrial discharge flow to the industrial WWTP shall not exceed a maximum average daily flow over any 30-day period of 3.4 mgd, and the total industrial discharge over the processing season shall not exceed 370 million gallons.

4. The effluent discharged to the domestic evaporation/percolation ponds shall not exceed the following limits.

Constituent	Units	Monthly Average	Daily Maximum
BOD_5	mg/l	40[1]	80
Settleable Matter	ml/l	0.2[1]	--

[1] If the reported concentration is greater than the criterion presented, a confirmation sample shall be collected for analysis within seven days of receiving the analytical data.

5. The effluent contained in the industrial evaporation/percolation ponds shall not exceed the following limits.

Constituent	Units	Monthly Average
BOD_5	mg/l	150

6. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment facility.

7. As a means of discerning compliance with Discharge Specification No. B.6, the dissolved oxygen content shall not be less than 1.0 mg/l in any pond at any time, as measured at a point at as far as practical from the pond inlet and within one foot of the water surface.

8. The discharge to conveyance systems, settling basins, ponds, or land disposal areas not adequately maintained to prevent off-site odor nuisance, fly breeding, or mosquito breeding is prohibited.

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

10. The pond system shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, seasonal ancillary inflow, and infiltration during the wet season. Design seasonal precipitation shall be based on total annual precipitation using a return of 100 years, distributed monthly in accordance with historical rainfall patterns.

11. Pond freeboard shall never be less than two feet in any pond as measured vertically from the water surface to the upper surface of the lowest adjacent dike or levee.

12. On or about **1 November** each year, available pond storage capacity shall at least equal the volume necessary to comply with Discharge Specifications No. B.10 and B.11.

C. Solids Disposal Requirements:

1. Collected screenings, sludge, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *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. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and U.S. Environmental Protection Agency (EPA) Regional Administrator at least 90 days in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal, State, and local laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

4. If the State Water Resources Control Board and the Regional Water Resources Control Board are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger shall comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

D. Groundwater Limitations:

The discharge, in combination with other sources, shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than background water quality, except for coliform. For coliform, increases shall not cause the most probable number of total coliform organisms to exceed 2.2/100 ml over any 7-day period.

E. Surface Water Limitations:

The Discharger shall not cause the Stanislaus River downstream of the evaporation/percolation ponds to contain waste constituents in concentrations statistically greater than background (upstream) surface water quality. Background surface water quality shall be determined when the required monitoring program provides sufficient data.

F. Provisions:

1. As described in Discharge Specification B.2, the Discharger shall submit a technical report which describes the implemented WWTP improvements. The report is required at least **15 days prior** to the Discharger's desire to increase the flow rates as described in Discharge Specification B.3.

2. By **1 January 2001**, the Discharger shall submit a technical report, prepared under the supervision of a registered engineer, which identifies opportunities to reduce, reuse, and recycle wastewater. The report shall identify sources of TDS in industrial wastewater, and recommend ways to reduce TDS. The report shall also evaluate reclamation alternatives both at the industrial discharger facilities and the WWTP. The report shall present a tabulation of all data used in evaluating the industrial wastewater flow.

3. By **1 January 2001** Discharger shall submit a Sludge Management Plan which describes the annual volume of sludge generated by the facility and specifies the proposed testing and disposal practices.

4. By **31 May 2001**, the Discharger shall submit a report, pursuant to Section 13267 of the California Water Code, indicating whether the discharge to the ponds has caused, or is

likely to cause, constituent concentrations in groundwater to exceed background concentrations. The report shall be prepared under the supervision of a Registered Geologist or Registered Engineer. If monitoring data indicates wastewater has degraded groundwater quality beyond background concentrations, the Discharger shall submit a Wastewater Disposal Mitigation Plan (WDMP) within 90 days of request by the Executive Officer. The WDMP shall address the magnitude and extent of groundwater contaminants, evaluate contaminant control alternatives, evaluate appropriate effluent limits, and select a preferred contaminant control alternative. The selected contaminant control alternative must comply with State Water Resources Control Board Resolution No. 68-16, Title 27 CCR, and the most recent Basin Plan. The WDMP shall include a proposed project schedule for design and construction.

5. The Discharger shall comply with Monitoring and Reporting Program No. 5-00-142, which is part of this Order, and any revisions thereto, as ordered by the Executive Officer.

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

7. If the Discharger wishes to increase daily or monthly flow limits at the industrial WWTP above what is allowed in this Order, then it must submit an RWD. A complete RWD shall be submitted at least 120 days prior to the anticipated increase in discharge.

8. The Discharger shall use the best practicable cost-effective control technique(s) currently available to comply with discharge limits specified in this order.

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

10. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.

11. The Discharger shall submit to the 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 being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board in writing when it returns to compliance with the time schedule.

12. 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.

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

14. The Board will review this Order periodically and may revise requirements when necessary.

I, GARY M. CARLTON, 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 16 June 2000.

GARY M. CARLTON, Executive Officer

Attachments
TRO: 6/16/00

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 5-00-142

FOR
CITY OF ESCALON
ESCALON WASTEWATER TREATMENT PLANT
SAN JOAQUIN COUNTY

This monitoring and reporting program (MRP) describes requirements for monitoring domestic wastewater, industrial wastewater, and groundwater. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Specific sample station locations shall be approved by Regional Board staff prior to implementation of sampling activities.

All samples should 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 sample chain of custody forms.

DOMESTIC WASTEWATER MONITORING

This section refers to the domestic wastewater system. Domestic wastewater influent and effluent samples shall be collected. Effluent samples shall be collected prior to discharge into the evaporation/percolation ponds. Freeboard and dissolved oxygen monitoring shall be performed at all treatment and evaporation/percolation ponds. Freeboard will be measured vertically from the surface of the pond water to the lowest elevation of the surrounding berm. Dissolved oxygen shall be measured at a point as far as practicable from the pond inlet and within one foot of the water surface. Effluent monitoring shall include, at a minimum, the following:

Constituent	Sample Location	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	Meter	gpd	Metered	Continuous	Monthly
Freeboard	All Ponds	Feet	Measurement	Weekly	Monthly
BOD_5[1]	INF/EFF	mg/l	Grab	Monthly	Monthly
Dissolved Oxygen	All Ponds	mg/l	Grab	Weekly	Monthly
Nitrate as Nitrogen	INF/EFF	mg/l	Grab	Monthly	Monthly
Settleable Matter	INF/EFF	ml/l	Grab	Monthly	Monthly
Specific Conductivity	Effluent	µmhos/cm	Grab	Monthly	Monthly
Total Dissolved Solids	Effluent	mg/l	Grab	Monthly	Monthly

BOD_5[1] denotes five-day, 20° Celsius Biochemical Oxygen Demand.
INF/EFF denotes sampling required for influent and effluent flows.

INDUSTRIAL WASTEWATER MONITORING

Samples shall be collected from established sampling stations located in an area which will provide samples representative of the wastewater at the inlet and at the evaporation/percolation ponds. Influent

samples shall be collected from the flow prior to addition of any WWTP recycled flow. Effluent samples shall be collected prior to discharge into the evaporation/percolation pond with the exception of effluent samples collected for BOD analysis. Discrete effluent BOD samples shall be collected from all the evaporation/percolation ponds that contain wastewater. The discrete effluent BOD samples shall be collected at a point as far as practicable from the pond inlet and within one foot of the water surface. Freeboard and dissolved oxygen monitoring shall be performed at all treatment and evaporation/percolation ponds. Freeboard will be measured vertically from the surface of the pond water to the lowest elevation of the surrounding berm. Dissolved oxygen shall be measured at a point as far as practicable from the pond inlet and within one foot of the water surface. Industrial wastewater monitoring shall be performed in all months when industrial wastewater is being received or treated at the plant. Effluent monitoring shall include at least the following:

Constituent	Sample Location	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	Meter	GPD	Metered	Continuous	Monthly
Freeboard	All Ponds	Feet	Measurement	Weekly	Monthly
BOD_5[1]	INF/Ponds	mg/l	Grab	Bi-Monthly[4]	Monthly
Dissolved Oxygen	All Ponds	mg/l	Grab	Weekly	Monthly
Nitrate as Nitrogen	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Total Kjeldahl Nitrogen	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Specific Conductivity	INF/EFF	µmhos/cm	Grab	Bi-Monthly[4]	Monthly
pH	INF/EFF	pH units	Grab	Bi-Monthly[4]	Monthly
Chloride	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Sodium	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Volatile Organic Compounds[2]	INF/EFF	µg/l	Grab	Bi-Monthly[4]	Monthly
Total Dissolved Solids	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Fixed Dissolved Solids	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Volatile Dissolved Solids	INF/EFF	mg/l	Grab	Bi-Monthly[4]	Monthly
Standard Minerals[3]	INF/EFF	mg/l	Grab	Annually	Annually

[1] BOD_5 denotes five-day, 20° Celsius Biochemical Oxygen Demand.
[2] Volatile Organic Compounds analysis by EPA Method 8010.
[3] Standard Minerals sample shall be collected in September or October and shall include, at a minimum, the following elements/compounds: Barium, Calcium, Magnesium, Sodium, Potassium, Chloride, Sulfate, Total Alkalinity (including alkalinity series), and Hardness.
[4] Sampling frequency will change to "Monthly" starting in year 2001 and following years.

INF/EFF denotes sampling required for influent and effluent flows.
INF/Ponds denotes sampling required for influent flow and pond water quality.
Bi-Monthly denotes sampling performed twice a month.

GROUNDWATER MONITORING

Groundwater samples shall be collected from each of the three groundwater monitoring wells currently installed, as well as all other wells installed subsequent to issuance of this MRP. The groundwater

monitoring program shall include the parameters/chemical analyses listed below. Sample collection and analysis shall follow standard EPA protocol. Each groundwater monitoring well shall be monitored at least for the following:

Constituents	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Groundwater Elevation	0.01 feet	Measurement	Quarterly	Quarterly
BOD_5[1]	mg/l	Grab	Quarterly	Quarterly
Dissolved Oxygen	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Specific Conductivity	µmhos/cm	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Volatile Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Chloride	mg/l	Grab	Quarterly	Quarterly
Sodium	mg/l	Grab	Quarterly	Quarterly
Volatile Organic Compounds[2]	µg/l	Grab	Quarterly	Quarterly
Total Coliform	MPN/100 ml	Grab	Quarterly	Quarterly
PH	pH units	Grab	Quarterly	Quarterly
Standard Minerals[3]	mg/l	Grab	Annually	Annually

1 BOD_5 denotes five-day, 20° Celsius Biochemical Oxygen Demand.
2 Volatile Organic Compounds analysis by EPA Method 8010.
3 Standard Minerals shall include the following compounds: Barium, Calcium, Magnesium, Sodium, Potassium, Chloride, Sulfate, Total Alkalinity (including alkalinity series), and Hardness.

SURFACE WATER MONITORING

The Discharger shall establish two sampling stations along the northern bank of the Stanislaus River; one approximately 100 feet upstream of the easternmost property boundary, and one approximately 100 feet downstream of the westernmost property boundary or pond. Surface water samples shall be obtained on the same day within one hour of each other. Samples of surface water shall be obtained at these locations within 10 feet of the shore and shall be analyzed for the following:

Constituents	Units	Type of Sample	Sampling Frequency	Reporting Frequency
BOD_5[1]	mg/l	Grab	Quarterly	Quarterly
Dissolved Oxygen	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Specific Conductivity	µmhos/cm	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Volatile Dissolved Solids	mg/l	Grab	Quarterly	Quarterly

Constituents	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Chloride	mg/l	Grab	Quarterly	Quarterly
PH	pH units	Grab	Quarterly	Quarterly
Standard Minerals[2]	mg/l	Grab	Annually	Annually

[1] BOD_5 denotes five-day, 20° Celsius Biochemical Oxygen Demand.

[2] Standard Minerals shall include the following compounds: Barium, Calcium, Magnesium, Sodium, Potassium, Chloride, Sulfate, Total Alkalinity (including alkalinity series), and Hardness. Sample shall be collected in Third Quarter of year.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, pond, groundwater well, etc.), and 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. The results of all monitoring performed by the industrial dischargers, or other parties, which are reported to the Discharger, shall be included in the next regularly 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 registered professional engineer or geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports for industrial wastewater ponds shall be submitted to the Regional Board by the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). Monthly reports for the months of March, June, September, and December may be submitted as part of the Quarterly Monitoring Report. Monthly monitoring reports shall contain all monitoring data required as described above for domestic and industrial wastewater.

B. Quarterly Monitoring Reports

Quarterly Monitoring Reports shall be submitted to the Regional Board by the **1st day of February, May, August, and November**. The Quarterly Report shall include the results of all regular monthly monitoring data generated and the results of groundwater and surface water monitoring performed. At a minimum, the report shall contain:

1. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities. 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 the casing volume; and total volume of water purged.

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

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

4. A comparison of monitoring data to the discharge specifications, groundwater limitations, and surface water limitations, and explanation of any violation of those requirements.

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

6. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and other sampling stations, and groundwater elevation contours referenced to mean sea level datum.

7. Copies of laboratory analytical report(s).

C. Annual Report

An Annual Report shall be prepared as the fourth quarter monitoring report. The Annual Report will 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. If requested by Staff, tabular and graphical summaries of all data collected during the year.

2. An evaluation of the performance of the domestic wastewater treatment system and evaporation/percolation ponds, as well as a forecast of the flows anticipated in the next year.

3. An evaluation of the performance of the industrial wastewater treatment system and evaporation/percolation ponds, as well as a forecast of the flows anticipated in the next year.

4. An evaluation of the groundwater quality at the wastewater treatment facility.

5. A summary data table of water levels and freeboard in the storage ponds.

6. 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.

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

8. An estimate of when flows will reach hydraulic and treatment capacities of the treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' flow, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Board by **31 January**.

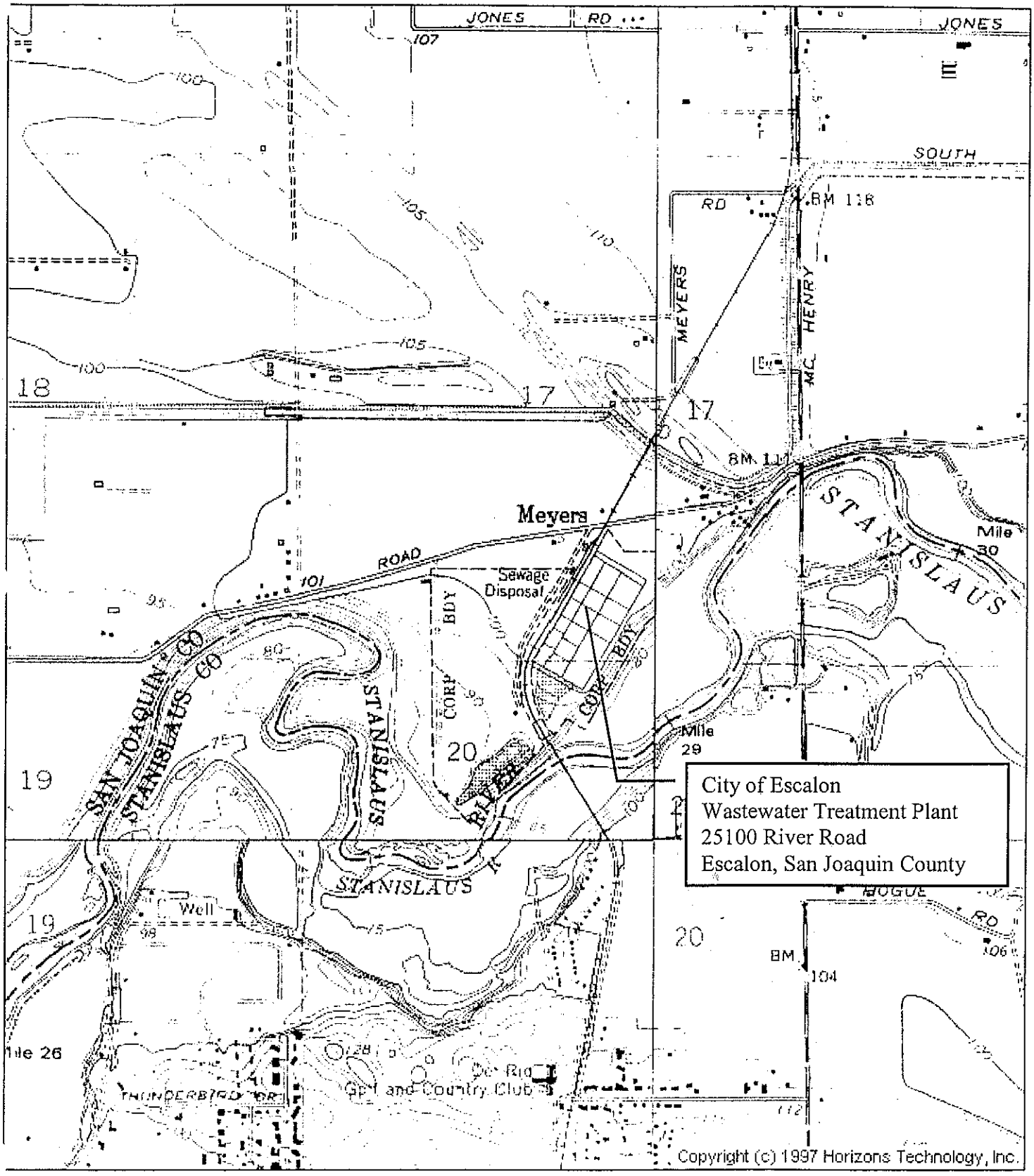
The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: _____
GARY M. CARLTON, Executive Officer

16 June 2000
(Date)

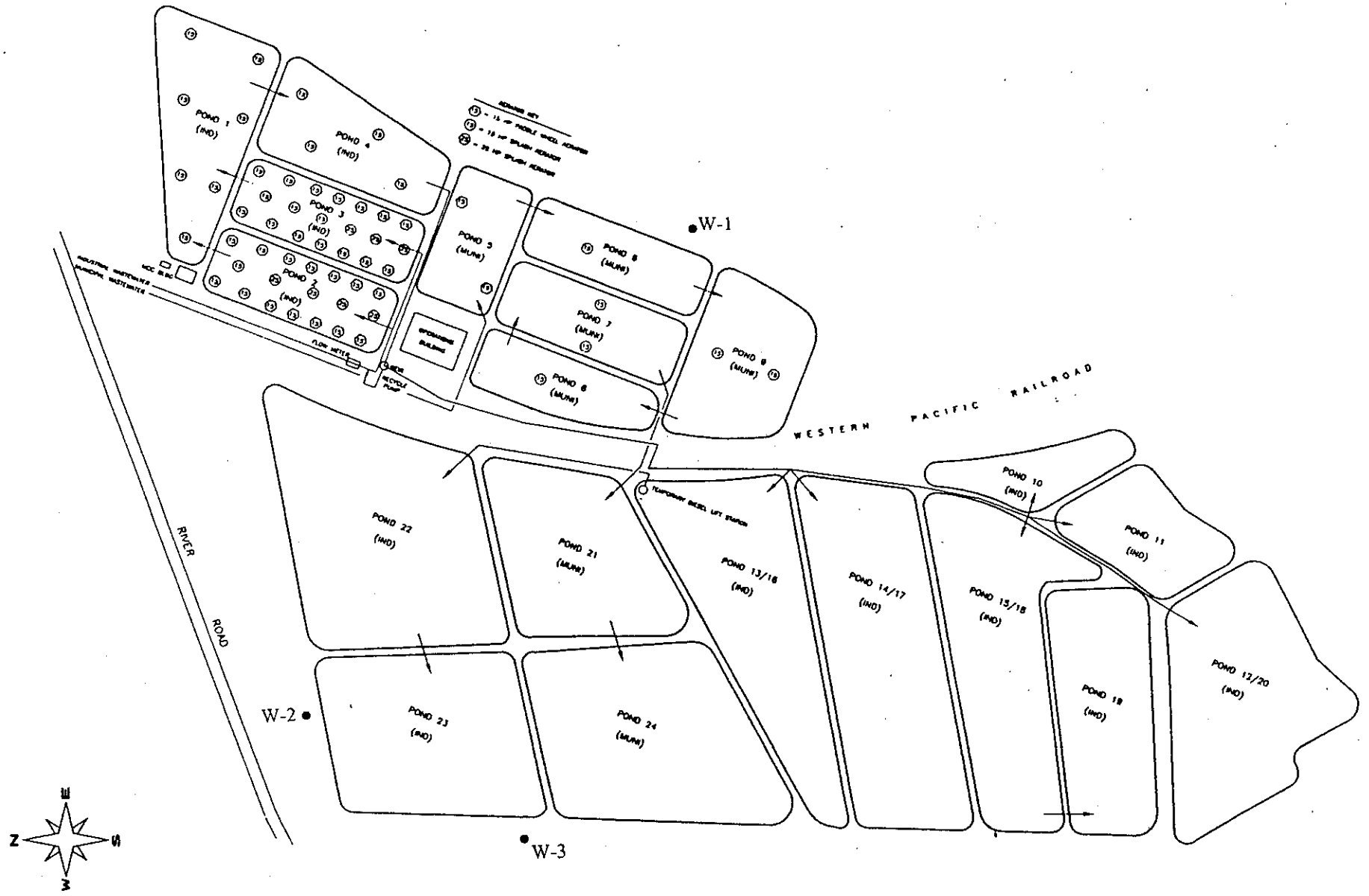
TRO: 616/00

ATTACHMENT A



Reference: USGS 7.5 Minute Topographic Maps
Avena, 1952; Riverbank, 1987
Thalheim; Salida, 1987

Approximate Scale
1 in = 1,420 ft.



Scale: Not to Scale	Drawing Reference: Nolte Associates, Figure 4 Wastewater Treatment Facilities Improvements Preliminary Design Study, March 2000	**SITE PLAN** PROPOSED CONSTRUCTION IMPROVMENTS WASTEWATER TREATMENT PLANT ESCALON, SAN JOAQUIN COUNTY

INFORMATION SHEET

ORDER NO. 5-00-142
CITY OF ESCALON WASTEWATER TREATMENT PLANT
SAN JOAQUIN COUNTY

The City of Escalon operates a domestic and industrial wastewater treatment and disposal facility at 25100 W. River Road, in Escalon, San Joaquin County. The facility receives domestic wastewater from the City of Escalon. Industrial wastewater, generated by Escalon Premier Brands (tomato canner) and Eckert Cold Storage (bell pepper canner) is discharged to the WWTP between the months of July and November. The peak discharge of industrial wastewater occurs in September and October, when approximately 90 to 95 million gallons per month of industrial wastewater is discharged.

The industrial wastewater is discharged to the WWTP via a 30-inch gravity pipeline which also conveys stormwater from the City of Escalon during the wet season. The industrial dischargers presently screen the wastewater prior to discharge to the WWTP. Escalon Premier Brands is in the process of evaluating pretreatment alternatives. Odor complaints were documented related to the industrial wastewater discharge in 1997, 1998, and 1999.

The domestic wastewater and the industrial wastewater are conveyed, treated, and disposed of in separate ponds. Domestic wastewater is discharged to five treatment ponds, all of which are mechanically aerated. Approximately 120 horsepower of mechanical aeration devices are located in the domestic wastewater ponds. Industrial wastewater is discharged to four treatment ponds, all of which are mechanically aerated. Approximately 610 horsepower of mechanical aeration devices are located in the industrial wastewater ponds.

The Discharger plans to construct improvements in the WWTP which will provide better treatment of industrial wastewater and increased flow capacity. The improvements consist of deepening the existing treatment ponds, construction of two new ponds, reconfiguration of existing ponds, piping changes, and addition of mechanical aeration devices. Enlargement of the treatment ponds is recommended; the enlargement will result in an additional 3.1 million gallons of storage capacity. The treatment ponds will be enlarged by deepening, the surface area of the ponds will not change significantly. The evaporation/percolation pond configuration improvements will result in an additional 13.7 acres of surface area and 18.3 million gallons of storage capacity. The improvements will allow an additional 1.41 million gallons per day of wastewater flow. An additional 210 horsepower of mechanical aerators are also planned for the treatment ponds.

Depth to the first water bearing zone is approximately 30-35 feet. These WDRs require characterization of the existing groundwater quality and quarterly groundwater monitoring. Three groundwater monitoring wells exist at the facility; however because of the groundwater flow direction, they are not located in areas which provide useful data on groundwater conditions.

Because the WWTP improvements have not yet been constructed, these WDRs contain interim discharge limits. The interim limits will be replaced with higher flow limits upon Executive Officer approval of a technical report describing the implemented WWTP improvements.

The Monitoring and Reporting Program requires monitoring of the domestic influent and effluent, industrial influent and effluent, and groundwater and surface water. Monitoring data will be used to determine whether wastewater treatment and/or pond mitigation efforts are necessary.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

2. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

3. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   a. Violation of any term or condition contained in this Order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;

   d. A material change in the character, location, or volume of discharge.

4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Regional Board. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements

   b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.

   c. The addition of a major industrial, municipal or domestic waste discharge facility.

   d. The addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.

A. General Provisions (continued)

5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

6. The discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.

7. The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

8. The discharger shall permit representatives of the Regional Board (hereafter Board) and the State Water Resources Control Board, upon presentation of credentials, to:

   a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,

   b. Copy any records required to be kept under terms and conditions of this Order,

   c. Inspect at reasonable hours, monitoring equipment required by this Order, and

   d. Sample, photograph and video tape any discharge, waste, waste management unit or monitoring device.

9. For any electrically operated equipment at the site, the failure of which could cause loss of control or containment of waste materials, or violation of this Order, the discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.

10. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be a defense for the discharger's violations of the Order.

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

A. General Provisions (continued)

12. The discharge shall remain within the designated disposal area at all times.

B. General Reporting Requirements

1. In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Board by telephone at (916) 255-3000 as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

   This plan shall:

   a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.

   b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes or contingency plans.

   c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

   The Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:

   a. For a corporation: by a principal executive officer of at least the level of senior vice-president.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor.

   c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.

B. General Reporting Requirements (continued)

d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;

(1) the authorization is made in writing by a person described in 3a, 3b, or 3c of this provision;

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(3) the written authorization is submitted to the Board

Any person signing a document under this Section shall make the following certification:

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

4. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. Failing to furnish the reports by the specified deadlines and falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the discharger.

5. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
3443 Routier Road, Suite A
Sacramento, CA 95827-3098

or the current address if the office relocates.

C. Provisions for Monitoring

1. All analyses shall be made in accordance with the latest edition of: (1) "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater" (EPA 600 Series) and (2) "Test Methods for Evaluating Solid Waste" (SW 846-latest edition). The test method may be modified subject to application and approval of alternate test procedures under the Code of Federal Regulations (40 CFR 136).

2. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Board.

   Unless otherwise specified, all metals shall be reported as Total Metals.

3. The discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

   Record of monitoring information shall include:

   a. the date, exact place, and time of sampling or measurements,
   b. the individual(s) who performed the sampling of measurements,
   c. the date(s) analyses were performed,
   d. the individual(s) who performed the analyses,
   e. the laboratory which performed the analysis,
   f. the analytical techniques or methods used, and
   g. the results of such analyses.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.

C. Provisions For Monitoring (continued)

5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.

6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources Bulletin 74-81 and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22

D. Standard Conditions for Facilities Subject to California Code of Regulations, Title 23, Division 3, Chapter 15 (Chapter 15)

1. All classified waste management units shall be designed under the direct supervision of a California registered civil engineer or a California certified engineering geologist. Designs shall include a Construction Quality Assurance Plan, the purpose of which is to:

   a. demonstrate that the waste management unit has been constructed according to the specifications and plans as approved by the Board.

   b. provide quality control on the materials and construction practices used to construct the waste management unit and prevent the use of inferior products and/or materials which do not meet the approved design plans or specifications.

2. Prior to the discharge of waste to any classified waste management unit, a California registered civil engineer or a California certified engineering geologist must certify that the waste management unit meets the construction or prescriptive standards and performance goals in Chapter 15, unless an engineered alternative has been approved by the Board. In the case of an engineered alternative, the registered civil engineer or certified engineering geologist must certify that the waste management unit has been constructed in accordance with Board-approved plans and specifications.

3. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the waste management units.

4. Closure of each waste management unit shall be performed under the direct supervision of a California registered civil engineer or California certified engineering geologist.

E. Conditions Applicable to Discharge Facilities Exempted From Chapter 15 Under Section 2511

1. If the discharger's wastewater treatment plant is publicly owned or regulated by the Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to California Code of Regulations, Title 23, Division 4, Chapter 14.

2. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The Board may take enforcement action against the discharger for by-pass unless:

a. (1) By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass. Severe property damage does not mean economic loss caused by delays in production); and

(2) There were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance; or

b. (1) by-pass is required for essential maintenance to assure efficient operation; and

(2) neither effluent nor receiving water limitations are exceeded; and

(3) the discharger notifies the Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph B.1. above.

3. A discharger that wishes to establish the affirmative defense of an upset (see definition in E.6 below) in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:

a. an upset occurred and the cause(s) can be identified;

E. Dischargers Exempt from Chapter 15 (continued)

b. the permitted facility was being properly operated at the time of the upset;

c. the discharger submitted notice of the upset as required in paragraph B.1., above; and

d. the discharger complied with any remedial measures required by waste discharge requirements.

In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Board by 31 January.

5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. Definitions

a. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper action.

b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.

E. Dischargers Exempt from Chapter 15 (continued)

c. The monthly average concentration is the arithmetic mean of measurements made during the month.

d. The "daily maximum" discharge is the total discharge by volume during any day.

e. The "daily maximum" concentration is the highest measurement made on any single discrete sample or composite sample.

f. A "grab" sample is any sample collected in less than 15 minutes.

g. Unless otherwise specified, a composite sample is a combination of individual samples collected over the specified sampling period;

(1) at equal time intervals, with a maximum interval of one hour

(2) at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

7. Annual Pretreatment Report Requirements:

Applies to dischargers required to have a Pretreatment Program as stated in waste discharge requirements.)

The annual report shall be submitted by 28 February and include, but not be limited to, the following items:

a. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the influent and effluent for those pollutants EPA has identified under Section 307(a) of the Clean Water Act which are known or suspected to be discharged by industrial users.

The discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR (Code of Federal Regulations) Part 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and sludge sampling and analysis shall be

E. Dischargers Exempt from Chapter 15 (continued)

performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto.

b. A discussion of Upset, Interference, or Pass Through incidents, if any, at the treatment plant which the discharger knows or suspects were caused by industrial users of the system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass Through, Interference, or noncompliance with sludge disposal requirements.

c. The cumulative number of industrial users that the discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

d. An updated list of the discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:

(1) Complied with baseline monitoring report requirements (where applicable);

(2) Consistently achieved compliance;

(3) Inconsistently achieved compliance;

(4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

E. Dischargers Exempt from Chapter 15 (continued)

(5) Complied with schedule to achieve compliance (include the date final compliance is required);

(6) Did not achieve compliance and not on a compliance schedule;

(7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be submitted quarterly from the annual report date to EPA and the Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

e. A summary of the inspection and sampling activities conducted by the discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:

(1) Warning letters or notices of violation regarding the industrial user's apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations;

(2) Administrative Orders regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;

(3) Civil actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;

E. Dischargers Exempt from Chapter 15 (continued)

(4) Criminal actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

(5) Assessment of monetary penalties. For each industrial user identify the amount of the penalties;

(6) Restriction of flow to the treatment plant; or

(7) Disconnection from discharge to the treatment plant.

g. A description of any significant changes in operating the pretreatment program which differ from the discharger's approved Pretreatment Program, including, but not limited to, changes concerning: the program's administrative structure; local industrial discharge limitations; monitoring program or monitoring frequencies; legal authority or enforcement policy; funding mechanisms; resource requirements; and staffing levels.

h. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.

i. A summary of public participation activities to involve and inform the public.

j. A description of any changes in sludge disposal methods and a discussion of any concerns not described elsewhere in the report.

Duplicate signed copies of these reports shall be submitted to the Board and:

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

and

State Water Resources Control Board
Division of Water Quality
P.O. Box 944213
Sacramento, CA 94244-2130

Revised March 1993 to update phone number of Central Valley Regional Board.

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