September 1st, 2021

Maia Hoffman
Pretreatment Engineer/Permit Manager
Washington State Department of Ecology
3190 160th Ave SE,
Bellevue, WA 98008

RE: Request for permit modification; increased average monthly and maximum daily flow limits (WA0002470, SP3).

Dear Maia,

Darigold is installing a redundant separator in parallel with an existing separator on the milk processing equipment. Having a redundant separator will allow for more frequent washing to enhance product quality. The process will remain the same however more frequent washing will generate additional wastewater. The redundant separator is scheduled to be online in November of this year.

More frequent washing is estimated to produce up to 60,000 gallons per day of additional wastewater volume, 600 additional pounds of BOD, and 103 additional pounds of TSS. Based on the projected flow increase, we are requesting and increase to the Average Monthly and Maximum Daily flow limits in our current permit (table shown below). The requested increase would result in an Average Monthly flow limit of 290,000 gallons and a Maximum Daily Limit of 326,000 gallons. We see no need to modify the existing permitted limits for BOD and TSS.

Current Permit Limits

Effluent Limits: SP 3 CIP & other discharge to Lynden WWTP Industrial (Process) Wastewater Latitude: 48.93764 Longitude: -122.453957		
Parameter	**Average Monthly [a, c]**	**Maximum Daily [b, c]**
Flow (MGD)	0.230	0.266
BOD_5	2600 lbs/day	5000 lbs./day
TSS	930 lbs/day	1460 lbs/day
	Daily Minimum	**Daily Maximum**
pH [d]	6.0 standard units	10.0 standard units

[a] Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured.

[b] Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the average discharge of a pollutant measured during a calendar day. For pollutants with limits expressed in units of mass, calculate the daily discharge as the total mass of the pollutant discharged over the day. This does not apply to pH or temperature.

[c] The daily mass discharged mass must be calculated from the daily flow and daily concentration values using the following formula: (concentration in mg/L) times (flow in MGD) times (8.34) = pounds per day

[d] When pH is continuously monitored, excursions between 5.0 and 6.0, or 10.0 and 11.0 are not to be considered violations if no single excursion exceeds 15 minutes in length and total excursions do not exceed 7 hours and 26 minutes per month. Any measurements below 5.0 and above 11.0 at any time are violations.

Darigold is in close communication with the City of Lynden concerning this request for additional flow limits. The City engaged their engineers to evaluate Darigold's request and has agreed to offer Darigold the requested limit increases under a controlled, stepwise approach. This approach will allow Darigold 20,000 gallons off additional capacity upon approval of the modified permit. Further, it will allow the City time to acclimate their process and monitor the effects of the additional volume before approving the next incremental increase in volume. The city will reserve the right to refuse advancement to subsequent phases should they experience adverse effects in their treatment system. I have included a letter from the City of Lynden further outlining the agreed approach and explaining the City's position.

It is important to note that Darigold will be in control of wash frequency which ultimately allows control of the additional wastewater volumes generated. We will be able to manage our wash schedule to stay withing our permitted limits. This further supports the phased-in approach offered by the City for the increased flow limits.

In cooperation with the City, and in light of this request for additional flow limits, Darigold has focused on sustainable process improvements. This includes an overall reduction to our monthly average discharge of roughly 20,000+ gallons during the months of July and August. We are also working with the city to manage peak and off-peak discharge flows to help improve their diurnal patterns. Darigold has developed and implemented system control logic to maximize off-peak discharges and limit peak flows. Beyond that Darigold has narrowed the targeted pH range in our discharge to provide further relief to the City's treatment process.

The Darigold pretreatment system consists of shock tanks, an equalization tank with aeration, mixing, and pH control, and a settling basin on the final discharge (former DAF vessel). High strength wastewater is diverted to shock tanks and hauled to a third-party digester for treatment. Low to moderate strength wastewater is pumped to the equalization tank for mixing, aeration, and pH adjustment. Discharge from the equalization tank passes through the settling basin where any settleable solids are captured and pumped to the shock tank. The equalization tank is 215,000 gallons and provides well over 24 hours of storage prior to discharge based on current flows (190,000 gallons). The hydraulic capacity of our discharge is 375 gpm allowing us to discharge the requested maximum daily limit of 326,000 gallons in under 13 hours. We believe this provides sufficient hydraulic and storage capacity to buffer, equalize, and neutralize our wastewater discharge. For additional information on the pretreatment system, I have included a copy of the engineering report from 2005. Please note the original stamped copy was not found however it is thought to have been provided to Ecology in 2005. The attached copy was provided by the original engineers involved with system design and permitting.

If you have any questions or concerns regarding this request please feel free to give me a call at the number listed below.

Respectfully,

Sheldon Knapp

Sheldon Knapp – Sr. ECM
Darigold

8424 Depot Road
Lynden, WA 98264
208-420-0751
Sheldon.Knapp@Darigold.com

Cc: Doug Pettinger, Senior Director, Environmental Compliance, Darigold
Mike Jaynes, Environmental, Health and Safety Manager, Darigold – Lynden
Vikram Sriram, Plant Manager, Darigold – Lynden
Mike Kim, City of Lynden Plants Superintendent
Steve Banham, City of Lynden Public Works Director

Phasing Plan – City of Lynden

CITY OF LYNDEN

PUBLIC WORKS DEPARTMENT
Steve Banham, Director
360-354-3446

August 31, 2021

Darigold- Lynden
Attn: Sheldon Knapp
8424 Depot Road
PO Box 193
Lynden WA 98264

Dear Sheldon

The City of Lynden has reviewed Darigold's proposal to increase flows by 60,000 gallons and BOD loads by close to 50% per day. The City's consultant, BHC Consultants, prepared the "Darigold Discharge Impacts" and "Lynden WWTP Feasibility" Technical Memorandums to evaluate Darigold's proposal, impacts to the treatment plant, and recommended improvements. We understand that Darigold will be applying to the Department of Ecology for a modification of their existing NPDES industrial discharge permit.

The City has started planning and engineering for capital improvements at the Wastewater Treatment Plant (WWTP) that will support your growth other anticipated growth within the City. In the short term, the City had purchased critical spare parts for additional treatment reliability. The City has requested the following process adjustments from Darigold to help facilitate receiving the increased flows and loading prior to plant expansion:

- Daily Flow Constraints – discharges during WWTP low flow periods, between 7:00 PM – 7:00 AM where possible. This will be especially helpful during wet winter months that can produce larger peak flow events.
- Balanced pH – more consistent and neutral pH.

We appreciate Darigold's proactive efforts to accommodate these requests. We hope the plant is able to sustain process improvements that will discharge wastewater with more consistent BOD and pH levels, and during diurnal low flow periods. These process improvements will undoubtedly aid the City as the operator of the Publicly Owned Treatment Works (POTW) to treat the proposed NPDES permit modification.

With Darigold's commitment to continue process improvement efforts stated above, the City can support a permit modification with the following phasing plan:

- Flow increases in three (3) phases – increasing discharge flows in three 20,000 gallons per day increments (i.e., 20,000, 40,000, 60,000);
- Minimum spacing of two (2) months between phases;

- Joint review and approval by the City prior to proceeding to the next phase;
- The Phase 1 increase of 20,000 gallons per day is acceptable immediately following Ecology permit modification approval.

I trust that this clarifies the City's position on Darigold's proposed wastewater permit increases and allows you to plan accordingly. We really appreciate the communication and cooperation and look forward to continuing to serve your treatment needs.

Sincerely,

Stephen Banham, P.E.
Director

Cc: Mike Kim, Plants Supervisor

Pretreatment System Engineering Report - 2005

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List of Figures

Section 1: Introduction

The following revised Engineering Report describes proposed improvements to the WestFarm Foods (WFF) facility located in Lynden, Washington. The original Engineering Report was received by the Department of Ecology (DOE) on 28 October 2004 and approved by DOE on 17 November 2004. The purpose of this revised report is to have an engineering report that conforms to the final design development for improvements to the wastewater treatment plant (WWTP).

The WFF Lynden facility receives approximately 4 million pounds (lbs) of raw milk per day. The milk is processed to produce cream and dried skim milk. Process wastewater is generated during equipment cleaning. The wastewater carries biochemical oxygen demand (BOD) and suspended solids. Equipment cleaning, performed at acidic and alkaline conditions, necessitates refined pH control. Plant effluent is discharged to the City of Lynden's (City) Public Owned Treatment Works (POTW). An existing pretreatment system is used to equalize flow and pH and remove total suspended solids (TSS) and BOD using dissolved air flotation (DAF). The capacity and instrumentation in the existing pH control system are inadequate to accommodate current flows from the system. Further, the existing DAF process requires pH adjustment below permit conditions in order to operate effectively and requires operator intervention and knowledge of this BOD removal technique.

Kennedy/Jenks Consultants designed the preferred alternative described in the October 2004 engineering report. That alternative included an increase in the equalization volume, revising the DAF system, and providing for a recycle of pretreated material if that stream did not meet discharge requirements (see Figure 2B).

At final review, Kennedy/Jenks Consultants determined the October 2004 alternative could be improved to better remove BOD through segregation of wastes rather than pretreatment and discharge of wastes. The BOD in the wastewater comes from fat, protein, and lactose in milk. By diverting the high-strength wastewater to the spill tank and hauling it for land application, we eliminate the BOD from a spill being discharged to the City POTW. If the high-strength wastewater runs through the DAF all the lactose and whey proteins pass through the DAF to the POTW. Approximately 18% to 20% of milk protein is whey protein. Of the solids in whole milk, 33% of the BOD is from lactose and another 6% to 7% is from whey proteins, which means that 40% (55% to 60% in the case of skim milk) of the BOD will pass through the DAF and be discharged to the City. This report recommends running the DAF only on spill material that is not acceptable for land application.

Also at final review, Kennedy/Jenks Consultants determined a better pH monitoring and control system could be provided by further increasing the equalization volume from 180,000 gallons to 215,000 gallons. By retaining over 95% of the daily permitted discharge of wastewater, the maximum benefit of commingling of alkaline and acidic cleaning solutions that are used on a daily basis would be received and then have sufficient residence time to adjust the final pH prior to discharge to the POTW.

The purpose of the following report is to describe proposed improvements in system capacity, pH control, and removal of BOD and TSS through segregation of spills.

Section 2 addresses requirements of Washington Administrative Code (WAC) 173-240-130, "Engineering Report for Industrial Wastewater Treatment Facilities." Each section of WAC 173-240-130 is assigned a section number for Section 2 of this report and presented with the WAC section and titles. The Appendices and References provide detailed documents and figures providing more background for the WFF Lynden WWTP Improvements.

1.1 Production Facility Description

The following facility description is excerpted from the National Pollutant Discharge Elimination System (NPDES) Permit Fact Sheet for the WFF Lynden facility.

WFF's Lynden plant processes approximately 4 million lbs of whole milk per day and produces approximately 377,000 lbs of nonfat dry milk per day. Other products include condensed skim milk and cream.

The production process begins with the unloading of raw milk to storage silos. The receiving area includes nine silos with capacities of 50,000 gallons each. The raw milk is transferred from the silos to cream separators. The cream is stored in three silos with capacities of 10,000 gallons each. Cream is transported by truck to other WFF facilities.

The skim milk fraction is directed to a combination of Blaw Knox TVR evaporator units, Rogers TVR evaporator units, and Wiegand MVR evaporator units. The resulting product is then sent to Rogers milk dryers. The dried milk is then transferred to cone bottom storage bins (four at 150,000 lbs capacity each). The dried product is dispensed from the storage bins to bags. The bags are stored in the warehouse and shipped.

The WFF Lynden facility consists of an "Old Plant" and a "New Plant." The newer portion of the plant recirculates non-contact cooling water. The evaporators, separators, pasteurizers, and heat exchangers are cleaned-in-place (CIP) by a fresh water wash and alternating cycles of caustic solution and acid solution. The most common CIP sequence consists of a pre-rinse, a caustic wash, a post-rinse, and an acid sanitizing rinse. The inorganic cleaning chemicals used in the process include sodium hydroxide, phosphoric acid, and nitric acid.

WFF is in the process of upsizing the newer, more efficient Wiegand-Rodger evaporation system in the New Plant and eliminating the older, less efficient Blaw Know evaporation system in the Old Plant. This modernization of the plant will reduce the amount of pipe, tanks, pumps and other equipment that are subjected to the daily waste generating CIP process and will be completed by 1 January 2006.

1.2 Brief Description of Existing Pretreatment

Please refer to Figure 1. CIP water gravity flows to a lift station where it is transferred to an equalization tank.

Currently, the resulting wastewater is sent to a 50,000-gallon equalization tank where pH is adjusted using carbon dioxide. Opacity sensors are located upstream of the equalization tank. When opacity exceeds a threshold limit, an automatic valve is switched to divert the high-strength flow to a 30,000-gallon "shock tank" that has about 24,000 gallons of usable volume. Contents of the shock tank are hauled by truck for discharge at a contract, offsite dairy lagoon.

The existing pretreatment plant configuration allows for pH adjustment prior to the DAF tank. When the DAF system was operating, sludge was hauled to a dairy lagoon or land applied. Treated effluent from the DAF overflows to a catch basin then to the City's sampling manhole. From there effluent flows by gravity to the City's POTW for treatment and discharge to the Nooksack River via the City's outfall.

1.3 Criteria for Proposed WWTP Improvements

Kennedy/Jenks Consultants evaluated the components of the existing WWTP at the WFF Lynden facility. A review of various treatment alternatives was performed. The evaluation was based on the following criteria:

- Improve pH control
- Minimal disruption of ability to discharge process wastewater
- Limited space for WWTP expansion
- Reasonable cost
- Ability to withstand highly variable wastestream characteristics and flows.

1.4 Baseline Recommendations

The proposed improvements include the following elements:

- Replace the existing Allen Bradley Programmable Logic Controller (PLC) with a larger one to improve the overall control system and WWTP visibility to the operators so that any problems can be corrected quickly. Install a HMI panel for the WWTP.
- Install flow meters to monitor, more accurately, the effluent from the WFF facility that flows to the POTW.
- Monitor flow from the WWTP and any overflow from the lift station sump.

- Increase the equalization storage volume to 215,000 gallons. Install a pump and VFD after the equalization tank to increase the usable volume.

- Install a “check point” in the system. pH will be checked on-line in a recirculation system on the equalization tank. Water will not be discharge to the POTW unless it is within the allowable range of acceptable pH values.

Section 2: Responses to Various Sections of WAC 173-240-130

2.1 WAC 173-240-130(2)(a); Type of Industry or Business

Dairy Industry. The WFF Lynden facility is a raw milk processing facility.

2.2 WAC 173-240-130(2)(b)(1): Kind and Quantity of Finished Product

The WFF Lynden plant processes approximately 4 million lbs of whole milk per day. Approximately 377,000 lbs of nonfat dry milk are produced per day. Other products include condensed skim milk, evaporated milk, and cream.

2.3 WAC 173-240-130(2)(c)(i): Quantity and Quality of All Process Water and How Disposed Of

2.3.1 Direct Discharge to Nooksack River

In 1995, the WFF facility installed a cooling tower to lower the temperature of cow water/non-contact cooling water prior to direct discharge to the Nooksack River.

Combined cow water/non-contact cooling water is approximately 800,000 gallons per day (gpd) maximum. The cow water/non-contact cooling water joins the City POTW effluent line at a point downstream of the POTW treatment and disinfection processes. Cow water/non-contact cooling water combines with POTW effluent for discharge through the City POTW outfall. The outfall has a peak flow rate of 5.0 million gallons per day (MGD), including 4.0 MGD from the POTW and 1.0 MGD from WFF.

2.3.2 Pretreated Process Water Discharged to POTW

The NPDES permit limits flow from the WWTP to: 226,000 gpd (moving 2 day average).

2.4 WAC 173-240-130(2)(c)(ii): Quantity of Domestic Wastewater and Method of Disposal

Domestic wastewater is not treated at the WFF facility. Domestic wastewater is conveyed to the local sanitary sewer system for treatment at the City POTW.

2.5 WAC 173-240-130(2)(c)(iii): Quantity and Quality of Noncontact Cooling Water and How Disposed Of

2.5.1 Direct Discharge to Nooksack River

In 1995, the WFF facility installed a cooling tower to lower the temperature of cow water/non-contact cooling water prior to direct discharge to the Nooksack River.

Combined cow water/non-contact cooling water is approximately 800,000 gpd maximum. The cow water/non-contact cooling water joins the City POTW effluent line at a point downstream of the POTW treatment and disinfection processes. Cow water/non-contact cooling water combines with POTW effluent for discharge through the City POTW outfall. The outfall has a peak flow rate of 5.0 MGD, including 4.0 MGD from the POTW and 1.0 MGD from WFF.

2.6 WAC 173-240-130(2)(c)(iv): Quantity of Water Consumed or Lost to Evaporation

Currently, there are insufficient data to perform a material balance on the WFF cooling tower. Flow meters must be installed on the potable water supply, cow water stream, and cooling tower blowdown in order to accurately quantify water consumption and evaporation losses.

WFF estimates the discharge volume of combined cow water/non-contact cooling water to be approximately 800,000 gpd maximum.

2.7 WAC 173-240-130(2)(d): Amount and Kind of Chemicals Used in the Treatment Process

Based on a 226,000 gpd, the estimated chemical consumption of the pretreatment process is 200 lbs per day 98% sulfuric acid, 245 lbs per day 50% sodium hydroxide, and 2,126 lbs per day of carbon dioxide. The consumption of sulfuric acid and sodium hydroxide are based on historic usage at the plant and will not substantially change with this proposed plant modification.

2.8 WAC 173-240-130(2)(e): Basic Design Data and Sizing Calculations for the Treatment Units

The basic design data for the facility has been reported in the Darigold Engineering Report dated 6 January 1989. Improvements will be made for in process storage, pH control, and process monitoring. Treatment unit size will not change with these modifications.

2.9 WAC 173-240-130(2)(f): Suitability of Site for the Facility

This project involves improvements to the existing WFF pretreatment facility. Expansion and improvements will be performed within the perimeter of the WFF facility.

2.10 WAC 173-240-130(2)(g): Description of Treatment Process and Operations, Including a Flow Diagram

A process flow diagram for the proposed pretreatment plant modifications is attached.

The fundamental process flow and unit operations will remain unchanged from the original design of the WFF treatment plant. However, system performance will be improved with increased equalization capacity, more rigorous monitoring of critical parameters, and a system for monitoring and circulating effluent if necessary. Following are more detail of the proposed improvements.

BOD is primarily managed by a spill alert system currently in place. The opacity of the wastewater at the lift station is monitored. If the opacity is high, indicating a spill, the flow from the lift station is diverted from the equalization tank to the spill control tank. The spill control tank volume will be increased to 50,000 gallons. Also, the opacity monitoring system will be upgraded to include a new Optek sensor that will improve spill detection over the current sensor.

The BOD in the wastewater comes from fat, protein, and lactose in milk. By diverting the high strength wastewater to the spill tank and hauling it out for land application we eliminate the BOD from a spill being discharged to the City POTW. If we run that high-strength wastewater through the DAF all of the lactose and the whey proteins pass through the DAF to the POTW. Approximately 18% to 20% of the milk protein is whey protein. Of the solids in whole milk, 33% of the BOD is from lactose and another 6% to 7% is from whey proteins, which means that 40% (55% to 60% in the case of skim milk) of the BOD will pass through the DAF and be discharged to the City. Currently, WFF only plans to run the DAF on spill material that is not acceptable for land application.

Equalization capacity will be increased to 215,000 gallons. This increased capacity will provide over 95%t storage of permitted daily flow of wastewater.

Discharge from the equalization tank will be monitored for pH. Water that meets pH criteria may be routed to the effluent sump. The facility will be configured for redundant monitoring prior to discharge to the POTW.

Improvements to the existing WFF pretreatment facility will include:

- A new tank will be installed to increase equalization storage capacity to 215,000 gallons.
- Opacity and pH monitors at the lift station sump.

- Flow meters on the inlet of the existing WWTP to manage treatment and accumulation rates.

- New monitors, pump, and valve controls linked to the existing Allen Bradley PLC and a new HMI control panel to improve automatic control and visibility of key parameters.

- A “check point” at the end of the system where pH, opacity (as an indicator of TSS and possibly BOD) could be checked on-line.

- A recirculation system from the effluent sump to allow for reprocessing of water that does not meet set-point limits for critical parameters.

Section 3: WAC 173-240-130(2)(h): Maps and Layout Sketches

Proposed improvements to the WFF pretreatment facility are illustrated in the attached sketches.

3.1 WAC 173-240-130(2)(i): Provisions for Bypass, If Any

CIP effluent from WFF facility flows by gravity from the production facility to a lift station for transfer to the equalization or shock tanks. The lift station consists of a forwarding pump and a redundant spare. In the event of both pumps failing, waste may overflow directly to the effluent line that flows to the POTW.

3.2 WAC 173-240-130(2)(j): Physical Provision for Oil and Hazardous Material Spill Control and/or Accidental Discharge Prevention

Provisions for oil and hazardous material spill control are outlined in the Spill Plan for the WFF Lynden facility.

3.3 WAC 173-240-130(2)(k): Results to Be Expected from the Treatment Process, Including the Predicted Wastewater Characteristics

The pretreatment system will be operated to meet the conditions of the NPDES permit number WA-000247-0 stated in section S1.C:

- Process flow of 226,000 gpd
- BOD_5 of 4,500 lbs per day
- TSS of 1,460 lbs per day
- pH not outside the range of 6-10.

Measurements for quantity are done on a 2-day moving average.

3.4 WAC 173-240-130(2)(l): Description of the Receiving Water, Location of Point of Discharge, Water Quality Standards, and How Water Quality Standards Will Be Met Outside of Any Applicable Dilution Zone

3.4.1 Pretreated Process Effluent

Pretreated process wastewater is discharged to the POTW. POTW effluent is discharged to the Nooksack River. The City POTW is the NPDES permittee for the outfall.

3.4.2 Direct Discharge of Cow Water/Noncontact Cooling Water

In 1995, the WFF facility installed a cooling tower to lower the temperature of cow water/non-contact cooling water prior to direct discharge to the Nooksack River.

Combined cow water/non-contact cooling water is approximately 800,000 gpd maximum. The cow water/non-contact cooling water joins the City POTW effluent line at a point downstream of the POTW treatment and disinfection processes. Cow water/ non-contact cooling water combines with POTW effluent for discharge through the City POTW outfall. The City POTW is the NPDES permittee for the outfall.

3.5 WAC 173-240-130(2)(m): Detailed Outfall Analysis

Direct discharge cow water/non-contact cooling water combines with POTW effluent for discharge through the City POTW outfall. The City POTW is the NPDES permittee for the outfall.

The outfall has a peak flow rate of 5.0 MGD, including 4.0 MGD from the POTW and 1.0 MGD from WFF. WFF did perform a detailed analysis of the outfall in September 2003 and a mixing zone study in August 2004.

3.6 WAC 173-240-130(2)(n): The Relationship to Existing Treatment Facilities, If Any

The subject project involves expansion and improvement of the existing pretreatment facility at WFF Lynden.

3.7 WAC 173-240-130(2)(o): Capacity of Municipal Sewerage System to Receive Industrial Effluent, If Applicable

3.7.1 City of Lynden POTW

The following information is excerpted from the Fact Sheet section of the WFF NPDES permit.

The City POTW consists of two oxidation ditches and two secondary clarifiers. Effluent BOD and TSS concentrations are normally in the range of 5 to 15 milligrams per liter (mg/L). The plant has generally operated well, with the notable exceptions of upsets mainly related to spills from the WFF plant. It is the opinion of the City's consultant that pH excursions have been the primary cause of upsets.

At the time of the drafting of the City's NPDES Permit, the POTW was considered to have a rated capacity of 7,000 lbs per day of BOD_5, based on a rating of 3,500 lbs for each of the two oxidation ditches.

3.7.2 Expected Effect of Proposed Improvements to WFF Pretreatment Facility

Implementation of the proposed improvements to the WFF pretreatment facility improve the ability to monitor and control pH. Increased storage capacity will allow for flow equalization and better pacing of flow through the treatment process. An increase in the number of continuous pH monitors will improve the ability to monitor and control pH with caustic and acid addition.

3.8 WAC 173-240-130(2)(p): Geohydrologic Evaluation of Impacts from Land Application, If Applicable

Wastes from the shock tank are collected by Western Services and hauled to a permitted bio solids lagoon for digestion and land application.

3.9 WAC 173-240-130(2)(q): Engineering Justification that Effluent from the Proposed Facility Will Meet Applicable Permit Effluent Limitations

Continuous monitoring of influent and effluent and ability to hold wastewater until its pH meets the permit parameters will facilitate compliance to permit limits for flow, BOD, TSS, and pH. Opacity will be monitored as an analog for TSS.

Increased storage capacity will allow for improved flow and pH equalization.

Segregation of spills from normal wastewater will reduce the amount of BOD sent to the POTW.

3.10 WAC 173-240-130(2)(r): Method of Final Sludge Disposal, and Other Alternatives That Were Considered But Rejected

Per current operation, sludge from the WFF DAF process will be stored and hauled for offsite disposal in a biosolids lagoon. Sludge from the lagoons is applied to local agricultural fields.

3.11 WAC 173-240-130(2)(s): Party Responsible for Owning, Operating, and Maintaining the Facility

WFF will continue to own and operate the pretreatment facility at their Lynden site.

3.12 WAC 173-240-130(2)(t): Compliance with State or Local Water Quality Management Plans

The outfall to the Nooksack River is owned by the City of Lynden, Washington, and regulated by a NPDES Permit for the City POTW. The NPDES permit is the jurisdictional document by which compliance with state water quality standards is implemented.

3.13 WAC 173-240-130(2)(u): Provisions for Any Committed Future Plans

The current capacity is 226,000 gpd. Increased equalization storage capacity is expected to provide adequate storage to exceed current production capacity. There are no plans for expansion of the WFF production capacity. Any changes to the WFF Lynden facility will be to improve efficiency, not increase capacity.

3.14 WAC 173-240-130(2)(v): Discussion of Alternatives and Reasons for Rejection

Four options for improvement of the process for treatment of WFF wastewater were considered. Following is a discussion of each option and the reasons for rejection. Block flow diagrams for each alternative are presented in the attached appendix.

3.14.1 Option 1: Increase Equalization Capacity to 87,500 Gallons

Increase surge capacity to 87,500 gallons, allowing for about 3 hours of residence time. Install variable frequency pump to allow use of full capacity of equalization tank. Operate the DAF with existing low pH chemistry (less than pH 5). This alternative offers the lowest capital cost. This option is rejected. Operation of the DAF at low pH increases the risk of low effluent pH. The existing DAF flocculation tank is undersized. DAF performance can be enhanced with better flocculation. Please refer to Figure 1 for a description of the existing system.

3.14.2 Option 2A: Increase Equalization Capacity to 180,000 Gallons, Improve Monitoring and Control, Add Monitor, Divert, Reprocess Capability

Increase equalization capacity to 180,000 gallons. Increase capacity of flocculation tanks. Increased storage capacity will meet the requirement of 6 hours of peak water flow storage. Modify DAF chemistry by substituting polymer for DAF flocculation to reduce the amount of acid. Installation of new variable frequency pumps will allow for improved regulation of

process flow rates. A MDR system at the effluent sump will allow for recirculation of process water that does not meet established limits for key effluent parameters. This option was designed and rejected in favor of option 2B. A description of this alternative is shown in Figure 2A.

3.14.3 Option 2B: Increase Equalization Capacity to 215,000 Gallons, Increase Spill Storage to 50,000 Gallons, Improve Monitoring and Control.

Increase equalization capacity to 215,000 gallons. Increased storage capacity will meet the requirement of 1-days permitted discharge. Since most of the wastewater flow occurs over a 6-hour period, this large holding tank will provide sufficient time to recirculate and adjust the pH of the wastewater prior to discharge. This volume will also allow WFF to take the greatest advantage of beneficial commingling of wastewater since the first portion of the CIP wastewater tends to be basic in nature and the last portion tends to be acidic. Increased spill storage volume will allow WFF to segregate large spills and send them to a permitted bio solids lagoon for digestion and land application, eliminating that BOD load from the POTW. The existing control system will be replaced with a new PLC, which will provide displays at the pretreatment area and inside the main plant. This new PLC will connected to the main plant PLC controls allowing the wastewater system monitoring to become more visible to plant operations. Enhanced control will also include an improved automatic turbidity-based spill diversion system, pH sensing at multiple points in the process, multiple flow indications and controls, tank level indications, chemical addition controls, and valve position and motor run indications. **This is the proposed alternative presented in this report**. A sketch of the preferred option is shown in Figure 2B.

3.14.4 Option 3A: Supplement DAF with Sequencing Batch Reactor

Increase surge capacity to 180,000 gallons and install a Sequencing Batch Reactor (SBR) system with DAF pretreatment.

SBRs are proven technology for treatment of dairy product wastestreams. Increased equalization capacity and DAF pretreatment would ensure a consistent BOD load to the SBR.

However, this technology is rejected due to the complexity of performing onsite biotreatment versus the relative ease of operating the selected physical-chemical treatment system. Furthermore, onsite biotreatment will require more land than is currently available at the WFF Lynden facility. Lastly, this alternative is not reasonable considering the additional cost over segregating waste streams or using a DAF system alone. Biological treatment to further reduce BOD is being supplied by the Lynden POTW. Please refer to Figure 3A.

3.14.5 Option 3B: Replace DAF with Sequencing Batch Reactor

Install a SBR and eliminate DAF pretreatment. This alternative would increase the size of the SBR system over option 3A but would reduce the costs associated with operation of the DAF system.

SBRs are proven technology for treatment of dairy product wastestreams. However, this technology is rejected due to the same reasons stated above. Please refer to Figure 3B.

3.14.6 Other Alternatives Considered and Rejected

3.14.6.1 Status Quo

No modification to existing system. Continue to operate with recent improvements implemented by WFF. Rejected. Although improvements have reduced the number of permit violations, this alternative is unacceptable.

3.14.6.2 Ultrafiltration or Microfiltration

Ultrafiltration (UF) membranes and microfiltration (MF) membranes can be effective for removal of fats, oil, and grease (FOG). However, there is a potential for FOG breakthrough, especially at high emulsion concentrations. In addition, these membranes typically have tortuous path morphologies that tend to trap fine particles and colloids eventually leading to membrane fouling. Frequent backflush is required to maintain operation. Chemical treatment for removal of foulants may be necessary. Rejected. The long-term reliability of this approach is unpredictable.

3.14.6.3 Anaerobic Digestion

Anaerobic digestion is effective in treating wastestreams with high concentrations of BOD, proteins, and fats, such as those found in the dairy industry. However, construction and operation of anaerobic treatment systems requires considerable fixed capital, operating expenses, and land. It would be more beneficial to expand the capability of the City POTW than to create additional pretreatment at the WFF site.

3.15 WAC 173-240-130(2)(w): A Timetable for Final Design and Construction

The improvements to the facitlity will be completed by December 31, 2005.

3.16 WAC 173-240-130(2)(x): Compliance with SEPA and NEPA, If Applicable

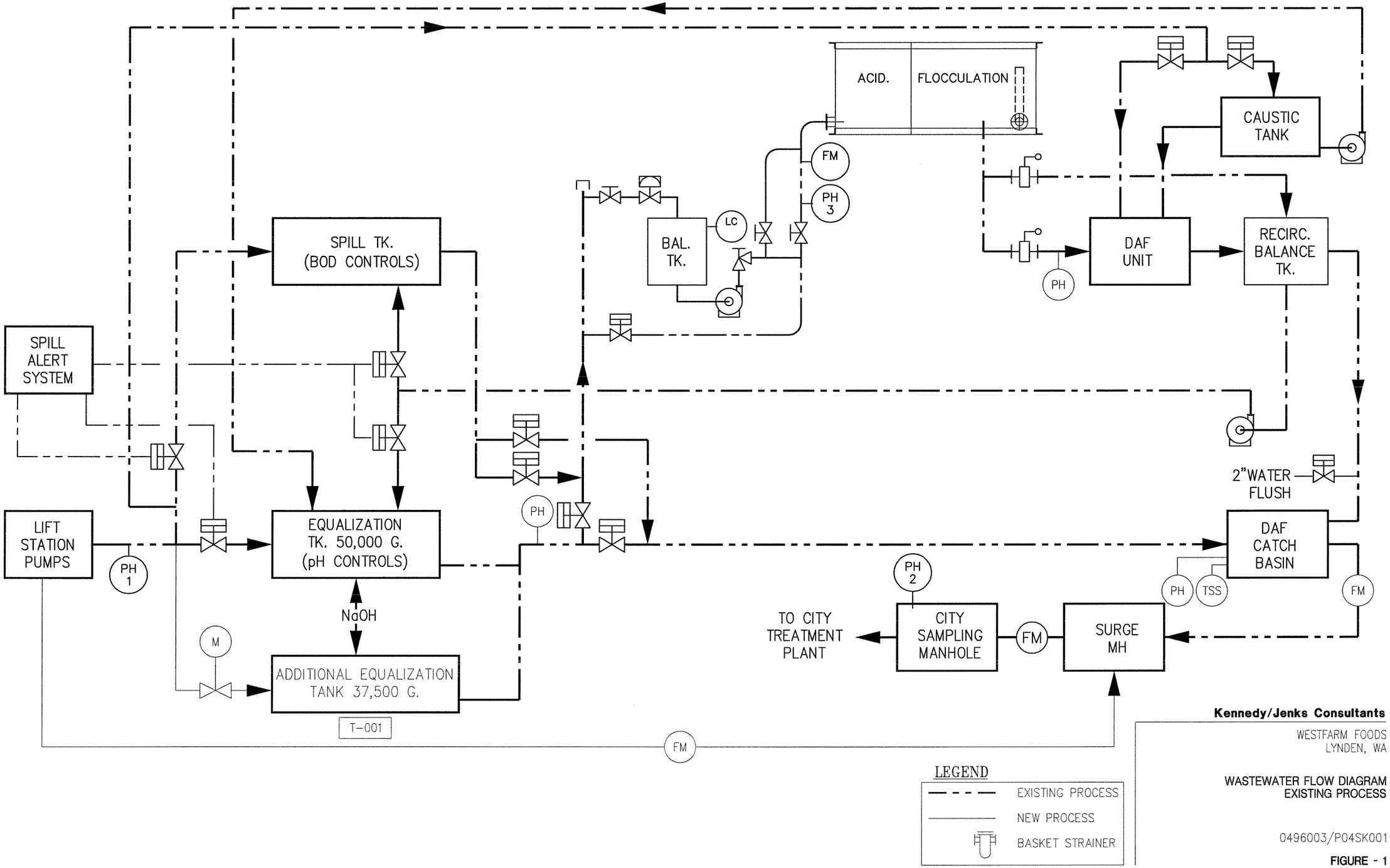
A SEPA checklist has been completed for the expansion of the WFF pretreatment facility.

3.17 WAC 173-240-130(2)(y): Additional Items for a Solid Waste Leachate Treatment System, If Applicable

Not applicable.

Section 4: References

NPDES Permit No. WA-000247-0, WestFarm Foods – Lynden Plant, Effective Date: July 2002, Expiration Date: June 30, 2005.



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WESTFARM FOODS
LYNDEN, WA

WASTEWATER FLOW DIAGRAM
EXISTING PROCESS

0496003/P04SK001

FIGURE - 1

H20
POLYMER

POLYMER MIXING & STORAGE

T-001

P-004

H2S04
NAOH

ACID.

FLOCCULATION

NEW CHEMICAL ADDITION SYSTEM

T-002

CAUSTIC TANK

FM

PH 3

LC

BAL. TK.

P-002A

P-002B

PH

DAF UNIT

RECIRC. BALANCE TK.

SPILL TK. (BOD CONTROLS)

SPILL ALERT SYSTEM

P-003A

P-003B

2"WATER FLUSH

LIFT STATION PUMPS

PH 1

M

EQUALIZATION TK. 50,000 G. (pH CONTROLS)

PH

DAF CATCH BASIN

PH

TSS

FM

P-001A

ADDITIONAL EQUALIZATION TANK 130,000 G.

P-001B

T-003

PH 2

TO CITY TREATMENT PLANT

CITY SAMPLING MANHOLE

FM

SURGE MH

FM

ME-001

AIR AGITATION

LEGEND

EXISTING PROCESS

NEW PROCESS

BASKET STRAINER

MECHANICAL BLOWER

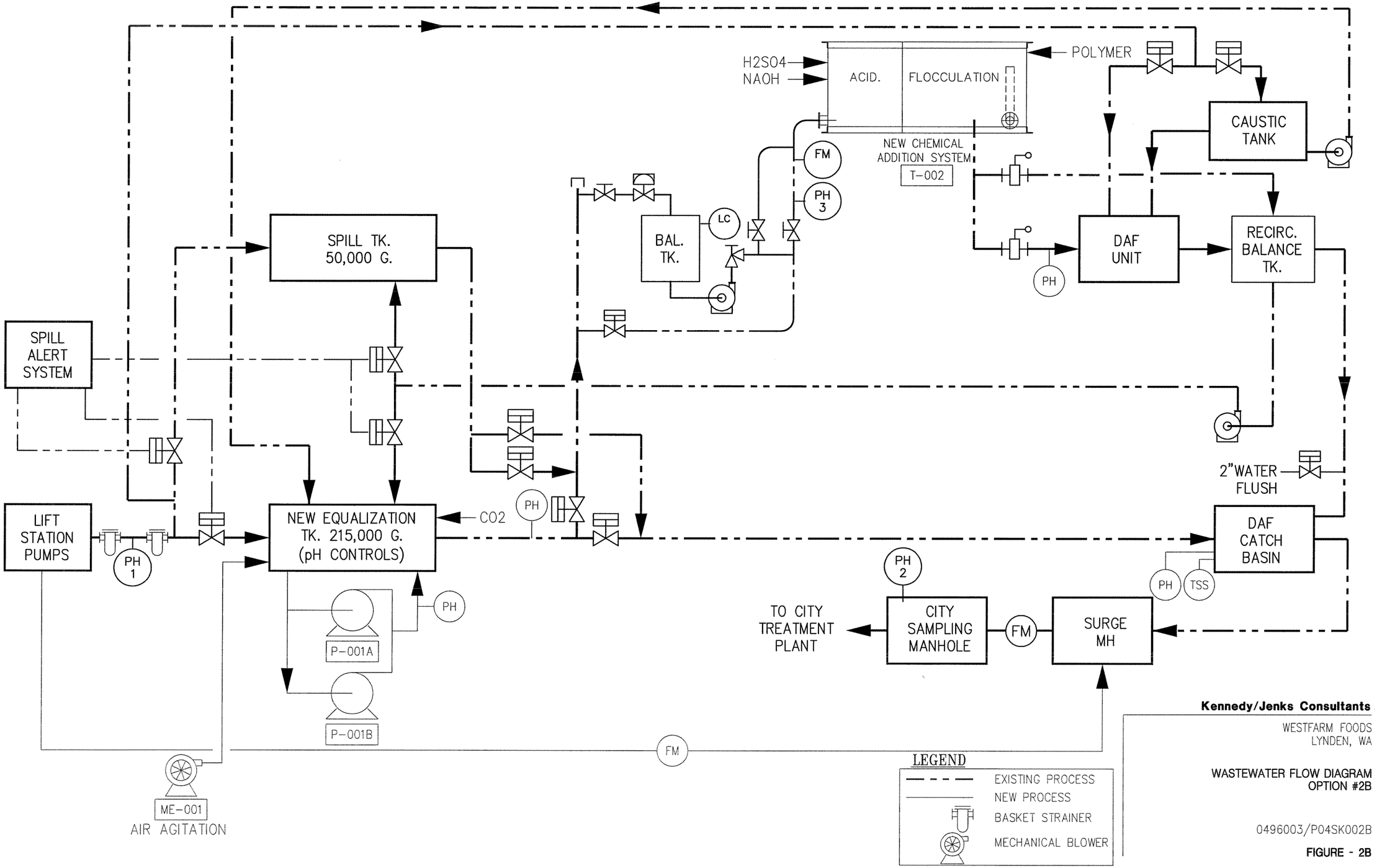
Kennedy/Jenks Consultants

WESTFARM FOODS
LYNDEN, WA

WASTEWATER FLOW DIAGRAM
OPTION #2A

0496003/P04SK002A

FIGURE - 2A



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WESTFARM FOODS
LYNDEN, WA

WASTEWATER FLOW DIAGRAM
OPTION #2B

0496003/P04SK002B

FIGURE - 2B

POLYMER MIX

T-001

ACID. FLOCCULATION

NEW CHEMICAL ADDITION SYSTEM

T-002

FM

PH 3

LC

BAL. TK.

P-002

CAUSTIC TANK

DAF UNIT

RECIRC. BALANCE TK.

PACKAGED SBR SYSTEM

SPILL TK. (BOD CONTROLS)

SPILL ALERT SYSTEM

2"WATER FLUSH

LIFT STATION PUMPS

PH 1

M

EQUALIZATION TK. 50,000 G. (pH CONTROLS)

PH

P-001A

P-001B

ADDITIONAL EQUALIZATION TANK 130,000 G.

T-003

DAF CATCH BASIN

PH

TSS

FM

PH 2

TO CITY TREATMENT PLANT

CITY SAMPLING MANHOLE

FM

SURGE MH

FM

ME-001

AIR AGITATION

LEGEND

EXISTING PROCESS

NEW PROCESS

BASKET STRAINER

MECHANICAL BLOWER

Kennedy/Jenks Consultants

WESTFARM FOODS
LYNDEN, WA

WASTEWATER FLOW DIAGRAM
OPTION #3A

0496003/P04SK003

FIGURE - 3A

DEMOLISH

ACID.

FLOCCULATION

FM

PH 3

LC

BAL. TK.

CAUSTIC TANK

DAF UNIT

RECIRC. BALANCE TK.

SPILL TK. (BOD CONTROLS)

SPILL ALERT SYSTEM

2"WATER FLUSH

LIFT STATION PUMPS

PH 1

M

EQUALIZATION TK. 50,000 G. (pH CONTROLS)

PH

P-001A

PACKAGED SBR SYSTEM

FM

TSS

PH

DAF CATCH BASIN

PH 2

TO CITY TREATMENT PLANT

CITY SAMPLING MANHOLE

FM

SURGE MH

M

ADDITIONAL EQUALIZATION TANK 130,000 G.

T-003

PH

P-001B

FM

ME-001

AIR AGITATION

LEGEND

EXISTING PROCESS

NEW PROCESS

BASKET STRAINER

MECHANICAL BLOWER

Kennedy/Jenks Consultants

WESTFARM FOODS
LYNDEN, WA

WASTEWATER FLOW DIAGRAM
OPTION #3B

0496003/P04SK004

FIGURE - 3B