



INTRODUCTION

Clean Water Technology, Inc., the creator of the Gas Energy Mixing (GEM) System, offers the most advanced primary treatment system on the market. The GEM System provides superior reduction of total suspended solids (TSS), biological and chemical oxygen demand (BOD/COD), fats, oils and grease (FOG) and turbidity.

CHALLENGE

A premier processor of quality and specialty dairy products in Victoria BC, was in need of an efficient, full scale wastewater treatment system to alleviate pressures from local authorities and to produce cost savings by reducing wastewater surcharges paid to the local municipality.



The large variety of processing lines included several milk products, dozens of ice cream varieties, flavored sour cream varieties, cottage cheese and a yogurt product line. This wide array of products produced a stream which varied wildly in terms of contaminant loading, composition, pH and chemical demand.

TABLE 1: GEM Effectiveness on Influent from Dairy Processor, Victoria BC

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	523 ppm	17 ppm	97%
BOD	1,130 ppm	425 ppm	62%
Turbidity	1,258 NTU	19 NTU	98%
FOG	~	< 7 ppm	99%

In addition to the challenges presented by the wastewater stream, the processor had very little space available for new equipment. Sludge handling and hauling was also a concern due the limited space for storage and the high vehicle traffic on site.

Based on initial estimates, the processor was in need of a multi-stage solution which included both primary treatment (GEM System) and secondary treatment (bio-degradation) in order to achieve the stringent discharge requirements.

The waste stream required a system adaptable to wildly changing streams, was easy to operate, occupied the least amount of space and produced the driest and least amount of sludge by volume. This led them to Clean Water Technology (CWT) and the GEM System.

COOPERATION

The client contacted CWT for a solution to these wastewater needs. Upon receiving samples from the client at CWT's laboratory in Los Angeles, CA, CWT performed a treatability study. CWT's testing results demonstrated that the GEM System would meet and exceed all of their treatment needs.

A full pilot demonstration was performed at the Client's processing facility, during which CWT treated and analyzed all of the client's waste streams in real time. The removal rates of the GEM System on the client's waste streams all had one common theme: 100% Success.

SOLUTION

After installation of the GEM System, the dairy processor has been experiencing excellent reductions in surcharges from the high contaminant removal rates of the GEM System.

The GEM System prevailed over the many challenges presented where other technologies would have struggled. By installing the GEM System, the Client benefitted from:

- Lower Surcharges, Eliminating Fines
- Adaptability to Changing Stream Conditions
- Easy Operation
- Smaller Footprint
- Improved Site Logistics
- Reduced Sludge Hauling Costs due to Drier, Denser Sludge



ECONOMICS

In addition to meeting the regulatory requirements and reducing the surcharges and fines, the GEM System achieved extremely high contaminant removal rates by removing TSS to trace amounts and reducing FOG to 7-10 ppm regardless of the influent FOG. Due to the absence of TSS and FOG after GEM System treatment, the footprint and sizing requirements of secondary treatment were greatly reduced, resulting in significant capital savings on the secondary treatment system.

EXPERIENCE

CWT's successful implementation of the wastewater treatment solution for the client not only comes with the innovative design of the GEM System, but from CWT's experience in the dairy industry. Shown below are results from some of the dairy processors with whom CWT has worked with in the past:

TABLE 2: GEM Effectiveness on Influent from Dairy Processor, Texas

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	340 ppm	32 ppm	90%
COD	3,000 ppm	1,500 ppm	50%
Turbidity	820 NTU	10 NTU	96%

TABLE 3: GEM Effectiveness on Influent from Dairy Processor, Michigan

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	950 ppm	32 ppm	95%
COD	4,000 ppm	1,200 ppm	70%
Turbidity	1,300 NTU	4 NTU	99%

TABLE 4: GEM Effectiveness on Influent from Dairy Processor, Miami, FL

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	450 ppm	25 ppm	92%
COD	3,400 ppm	1,300 ppm	60%
Turbidity	950 NTU	8 NTU	99%

TABLE 5: GEM Effectiveness on Influent from Dairy Processor, Downey, CA

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	2,300 ppm	20 ppm	98%
COD	13,000 ppm	4,500 ppm	65%
Turbidity	1,450 NTU	32 NTU	95%

