



The dairy plant located in St. Claude, Manitoba was facing operational and regulatory pressure due to the significant amounts of BOD it was discharging into the community wastewater system. Levels of BOD discharged from the plant were steadily increasing creating pressures on the Town's lagoon system, increasing from 450 mg/L in June – November 1990 to 2,512 mg/L in the January – April 1992 period. These increasing levels of BOD were placing a strain on the Town's primary cell's aeration system reducing the system's ability to deal with the BOD load.

Nordevco was approached to determine if its BactiDomus® Technology would be able to provide a solution. Specifically, could the BactiDomus® Technology reduce the BOD loading on the lagoon primary cell.

As the total storage capacity of the plant's wastewater holding system (a series of wastewater storage pits located both inside the plant and outside on the plant property) represented only 53% of the total daily volume of water used, Nordevco understood that it would have to try and maximize the contact time between the BactiDomus® Technology products (106, 210, 402 and 403) and the effluent being discharged from the facility. That was accomplished by using the Town's sanitary sewer system as an extended treatment system.

The primary focus of BactiDomus® Technology product applications were the wastewater pits both inside and outside the pit. However, additional applications of BactiDomus® Technology products through manholes along the path the effluent took traveling to the lagoon, allowed for an increased treatment time and greater reduction in BOD.

Applications of the various BactiDomus® Technology products continued at varying degrees of regularity from July 20, 1992 until March 13, 1993. While the majority of the treatment focused on the dairy plant wastewater holding system and the sanitary sewer lines, a direct treatment of the lagoon primary cell took place on August 19, 1992.

It was made clear to Nordevco staff that at a minimum, the sewer lines between the plant and the lagoon had not been cleaned in a number of years – it could not even be confirmed that the lines had ever been cleaned. The application of BactiDomus® Technology products to both the plant effluent and the sewer lines would mobilize the years of existing accumulated organic matter and FOG allowing them to flow through the system to the lagoon primary cell. To moderate this temporary increased flow in organic material a BactiDomus® Technology product was, in August 1992, applied directly to the primary cell to deal with this short-term added BOD/organics load.

Results

A. THE DAIRY PLANT

1. BOD:

<u>TIME SPAN</u>	<u>AVERAGE BOD</u>	<u>PERCENT CHANGE IN BOD</u>
JANUARY – APRIL 1990	450 MG/L	N/A
JANUARY – APRIL 1992	2,512 MG/L	558.2% INCREASE
TREATMENT INITIATED JULY 20, 1992		
JUNE – DECEMBER 1992	1,609 MG/L	35.9% REDUCTION
JANUARY – MAY 1993	1,342 MG/L	16.6% REDUCTION
JUNE 1992 – MAY 1993 TREATMENT PERIOD		46.6% REDUCTION

2. Visual observations:

Prior to treatment all the pits were coated with a heavy accumulation of grease and fat. After the treatment most of the accumulated grease and fat had been broken free from the pit walls, began to break down and traveled through the system to the Third Outside Pit (see diagram below) where they were easily removed by vacuum suction truck.

It is important to note that no mechanical or production changes were implemented during the treatment period. It is also important to note that unknown to Nordevco staff, a biocide was used in the facility during the period of treatment. This information was relayed to a Nordevco staff person during a conversation with a plant maintenance staff member after the project was completed.

While it is clear that the biocide would have had a negative impact on the treatment, it is impossible to estimate the magnitude of that impact.

2. THE MUNICIPAL WASTEWATER SYSTEM:

In order to monitor the impact of the treatment on the BOD entering the lagoon system it was decided, in consultation with the client, that sampling would be conducted at the lift station just west of the primary cell. All wastewater generated by the Town and dairy had to travel through this lift station to enter the primary cell.

While there was no historical data for BOD or COD levels at the lift station, a sample taken on June 30, prior to the first application of product indicated a BOD of 500 mg/L and a COD of 1,200 mg/L. A total of ten samples were drawn from the lift station during the period of treatment. The average BOD of those samples was 280 mg/L and the average COD was 604 mg/L. These represent a 44 percent reduction in BOD and a 49.5 percent reduction in COD.