Duffield Lagoon Municipal Water Treatment Project

Project Overview

Client: Parkland County
Location: Duffield Lagoon
Project Type: Municipal Water Treatment
Water Treatment Method: Semi-Submersible Pump, PROH2O® Unit, Membrane, UV Disinfection

Key Statistics:

- **Total Effluent Volume:** 30m^3 of lagoon water

- **Feed Recovery Method:** Electric submersible pump

- **Water Recovery Efficiency:** 97%

- **Purpose:** Evaluate complete lagoon cleanup effectiveness

Project Description

Parkland County commissioned our team to help recycle municipal waste from the Duffield Lagoon, an active facility where material is continuously deposited. The project aimed to assess the reduction of **Total Suspended Solids (TSS)** and bacteria levels in the effluent water.

To achieve this, we used a **semi-submersible pump** to deliver the lagoon's water to our **PROH2O® unit**, where it was passed through a **ceramic membrane** filtration process. The concentrate, containing higher levels of contaminants, was directed to a holding tank. The filtered water, or **permeate**, was then treated with a **UV disinfection system** to further purify the water before being returned to the lagoon after sample testing.

Treatment Process Flow

1. **Water Extraction:** The lagoon's effluent was recovered using an electric submersible pump.

2. **Filtration:** The extracted water was passed through the **PROH2O® unit**, utilizing ceramic membrane technology to filter out suspended solids and other contaminants.

3. **Concentrate Storage:** The concentrated waste from the filtration process was directed to a holding tank.

4. **UV Disinfection:** The filtered water (permeate) was treated with UV disinfection to ensure bacterial levels were reduced before being returned to the lagoon.

5. **Effluent Return:** After processing and sampling, the treated water was discharged back into the lagoon.

Results & Analysis

The primary goal of the project was to evaluate the reduction in **Total Suspended Solids (TSS)** and bacteria from the lagoon's feedstock. Below are the results comparing the influent and effluent parameters:

Parameter	Influent	Effluent	Units
Total Suspended Solids (TSS)	106 mg/L	34 mg/L	mg/L
Total Dissolved Solids (TDS)	1310 mg/L	1250 mg/L	mg/L
BOD (5-day, Carbonaceous)	725 mg/L	43 mg/L	mg/L
Ammonia (Total as N)	13 mg/L	10.2 mg/L	mg/L
Coliforms, Fecal	>200.5 MPN/100mL	<1.0 MPN/100mL	MPN/100mL

Key Findings:

- **Significant Reduction in TSS:** The treatment process successfully reduced the Total Suspended Solids from 106 mg/L in the influent to 34 mg/L in the effluent.

- **Bacterial Reduction:** Fecal coliforms were reduced from >200.5 MPN/100mL in the influent to less than 1.0 MPN/100mL in the effluent, indicating effective bacterial treatment.

- **Ammonia Levels:** Ammonia levels were slightly reduced from 13 mg/L to 10.2 mg/L, demonstrating the efficiency of the treatment system.

AQUA PURE
TECHNOLOGIES

Conclusion

This project successfully demonstrated the effectiveness of using the **PROH2O® filtration system** in reducing contaminants in an active lagoon environment. The 97% water recovery rate and significant reduction in both **Total Suspended Solids (TSS)** and **fecal coliforms** highlight the potential for large-scale municipal water recycling and lagoon cleanup.

The treatment system not only improved water quality but also provided valuable data for Parkland County in assessing ongoing wastewater management strategies. The results suggest that this solution can be applied to other similar facilities to help address waste management challenges in municipal lagoons.