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InnoFloc — Potato Processing Wastewater Clarification and Reuse

Case Study | Kroeker Farms, Winkler, Manitoba

97.3%	96.1%	95.3%	1,000 m³/d
TSS Removal	COD Removal	TP Removal	Design Flow

Project Background and Challenge

Kroeker Farms, a leading potato producer in Western Canada, sought a cost-effective solution to clarify wastewater generated during potato washing and cleaning operations. Their existing process relied on continuous water reuse until the water became too contaminated, at which point it had to be flushed and replaced. This approach resulted in high water costs and environmental surcharges.

The wastewater contains high concentrations of contaminants that must be removed to enable safe reuse:

- Total Suspended Solids (TSS)
- Chemical Oxygen Demand (COD)
- Biochemical Oxygen Demand (BOD)
- Total Phosphorus (TP)

Due to the strength of the wastewater, reuse in the cleaning process was limited, and discharging to the municipal system imposed significant surcharge costs on Kroeker Farms. As part of their sustainability strategy, the farm sought an effective solution to reduce pollutant loads, improve wastewater quality for reuse, and eliminate municipal fines associated with exceeding discharge limits.

The Innovantage Solution

Innovantage leveraged Kroeker Farms' existing infrastructure to implement the InnoFloc clarification process. This inline chemical dosing system promotes coagulation and flocculation, effectively separating suspended solids, organics, and phosphorus from the wastewater through settling and sludge removal.

Wastewater collected in holding tanks underwent chemical conditioning using food-grade coagulants and flocculants. Overnight settling allowed the clarified water to separate from the sludge, enabling safe reuse in the cleaning process. The treated effluent consistently met both reuse and municipal discharge requirements, avoiding fines and reducing overall water consumption.

The captured solids were thickened and transported for land application, where their organic matter and nutrient content contribute to a circular economy approach within Kroeker Farms' agricultural operations.

To extend similar treatment to their organic processing line, Innovantage investigated suitable organic-certified chemicals, identified a certified supplier, and tested their performance in coagulation using InnoFloc technology. In collaboration with the supplier, Kroeker Farms, and the certifying authority, the selected chemical was validated and certified as organic for use in the plant's organic line — enabling full-plant wastewater management.

Project Information	
Location	Winkler, Manitoba, Canada
Client	Kroeker Farms

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Project Type	Industrial Wastewater Treatment and Clarification
Completion Date	September 2024
Design Flow	1,000 m³/day

Results — Treated Potato Processing Wastewater Quality

The InnoFloc technology implemented by Innovantage successfully reduced contaminant levels in the wastewater, enabling the effluent to meet municipal discharge targets. Total Suspended Solids (TSS) — a key parameter that previously exceeded acceptable limits and incurred surcharges from the City of Winkler — was effectively reduced from 1,830 mg/L to 49.1 mg/L.

Using this process, approximately 1,000,000 litres of wastewater were treated in approximately 2 hours, followed by overnight settling to achieve full clarification.

Contaminant	Influent (mg/L)	InnoFloc Effluent (mg/L)	Removal Efficiency (%)
Total Suspended Solids (TSS)	1,830	49.1	**97.3%**
Chemical Oxygen Demand (COD)	792	31	**96.1%**
Biochemical Oxygen Demand (BOD)	100	6	**94.0%**
Total Phosphorus (TP)	3.84	0.182	**95.3%**

Key Takeaways

- Exceptional clarification: TSS (97.3%), COD (96.1%), BOD (94.0%), and TP (95.3%) removal — meeting both reuse and municipal discharge standards.
- Water savings: Enables continuous reuse of treated water in the cleaning process, significantly reducing freshwater consumption.
- Eliminated municipal fines: TSS reduced well below the City of Winkler's surcharge threshold, removing a recurring operational cost.
- Circular economy: Captured solids land-applied within Kroeker Farms' agricultural operations, returning nutrients to the soil.
- Full-plant organic certification: InnoFloc process extended to the organic processing line using certified organic coagulants, enabling complete plant wastewater management.