



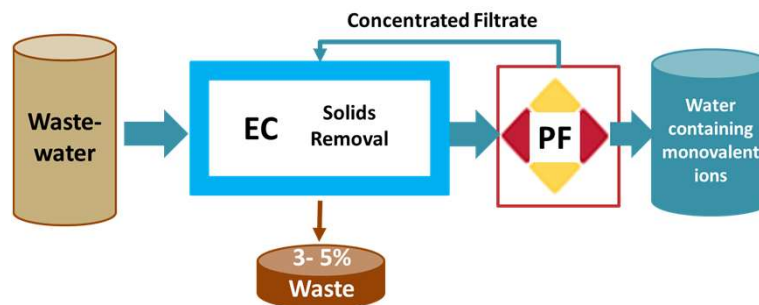
## Simplifier: Discharge-Reuse Process for high-load wastewater

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### Details of the demo / pilot

Name of client – Pineland Farms  
Location of plant – Maine  
Application Type – Cheese whey and wash water effluent  
Flow rate – 15,000 GPD

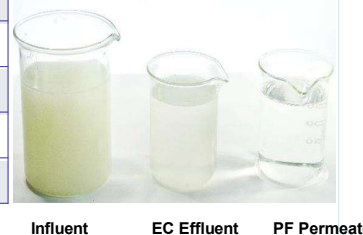
The pilot study utilized a process combining electrocoagulation (EC) equipped with aluminum electrodes and ceramic picofiltration (PF) operated in cross-flow mode. There are three supporting unit operations (liquid/gas separation, gas/de-foam, and solids removal). The system was operated in batch mode for purposes of this study.



### The Experience

The Simplifier process was operated at >90% hydraulic recovery, demonstrated sustained flux, and met BOD discharge requirements of <350 mg/L. The equipment used during this trial included an in-line EC that does not utilize a vat configuration. The process was able to reduce BOD, COD, TSS, and hardness to the target levels while also removing phosphate and nitrogen species.

Parameter	Inlet (mg/L)	Permeate (mg/L)	Rejection (%)
TSS	2 400	0	100
BOD	3 400	203	94
COD	11 450	675	94
Hardness	164	1	99
NO3-N	1.71	0.42	75
TKN	151	13.3	91
PO4	84	1.2	99



### What was the compelling value proposition?

Water is an increasing business risk for manufacturers as they face tighter discharge regulations and increased stress on freshwater resources. These factors drive adoption of the Simplifier process as it can provide >95% recovery of re-use quality water at a projected cost to treat of \$0.015/gallon of wastewater. This can provide an ROI to the customer of <2 years. The key advantage is that the ceramic PF resists fouling from the EC effluent while at the same time the recycled PF permeate increases both the EC and overall process efficiency.

### What problem did this aim to solve?

Treating and disposing of high nutrient wastewater is a growing problem for the food and beverage industry (cheese, yogurt, beer, etc.). Costs include meeting local municipal regulations for minimal discharge levels of TSS, and BOD/COD. Pineland Farms was evaluating the Simplifier as a means to minimize the volume of waste being transported offsite while meeting the effluent regulations for both TSS and BOD/COD set by the municipal treatment plant. This process solution becomes even more valuable in the future as projected increases in production could limit the amount of waste that can be transported offsite.

### What this means for the future?

The Simplifier has demonstrated the ability to treat cheese whey and dairy wash water effluent for discharge into a municipal sewer system. Improved solids handling of the EC will enable >97% hydraulic recovery with the option of capturing value-added components in the solids. Because product water from the ceramic membrane is high quality, this process can be used to enhance the downstream removal or recovery of ammonia. The small footprint, and scalability of this process makes it an ideal solution for food and beverage processors operating in drought prone or water stressed regions.