YB TECHNOLOGIES, LLC
APPLE PROCESSING & EQUIPMENT WASH/RINSE WASTEWATER TREATMENT
Pilot Project Summary

Prepared by: YB Technologies, LLC
In Partnership With: Titus Water Solutions, Inc.
Location: Yakima, WA
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YBT

Technologies for a Cleaner Future

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Project Overview

The YB Technologies Twister “Enhanced” Advanced Neutralization™ (AN™) pilot successfully demonstrated treatment of apple processing wastewater, reducing Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) below NPDES discharge limits. The study provides engineering validation for full-scale system design and deployment in food processing applications.

Technology Description

Technology: Twister “Enhanced” Advanced Neutralization™ (AN™)
Components:

- Advanced Neutralization™ – Cavitated Electrocoagulation (YB Technologies, LLC)
- Titus Twister – Aeration Mixing with Ozone Augmentation (Titus Water Solutions, Inc.)

Treatment Objectives: Reduce BOD and TSS below NPDES permit limits and collect engineering data for full-scale system design and fabrication.

Target Parameters

• Biochemical Oxygen Demand (BOD)
• Total Suspended Solids (TSS)
• pH

Results Summary

All permit parameter discharge limits were achieved, meeting 30 mg/L for both BOD and TSS.

Twister-Enhanced AN™ Technology Pilot Study Data Summary Table

Water Type	Sample ID	BOD (mg/L)	TSS (mg/L)	Turbidity (NTU)	pH (S.U.)
Apple	Process-Untreated	1332	440	>200	6.83
Apple	Wash-Untreated	272	106	92 / 95 / 90	6.94
Treated	Treatment A	<2	6	6 / 9 / 10	7.65
Treated	Treatment B	<2	8	2 / 2	5.64
Control	Source Water	<2	2	1 / 1 / 3	7.85 – 8.14

Discussion

The pilot demonstrated the ability of Twister Enhanced AN™ to achieve advanced coagulation and solids separation. The combination of electrocoagulation and ozone-augmented aeration polishing yielded high-efficiency contaminant removal and stable pH control.

- BOD and TSS Removal Efficiency: >99%
- pH Stabilization: Neutralized within the 6.5–8.0 range
- Visual Clarity: Significant turbidity reduction from >200 NTU to <10 NTU

Figures

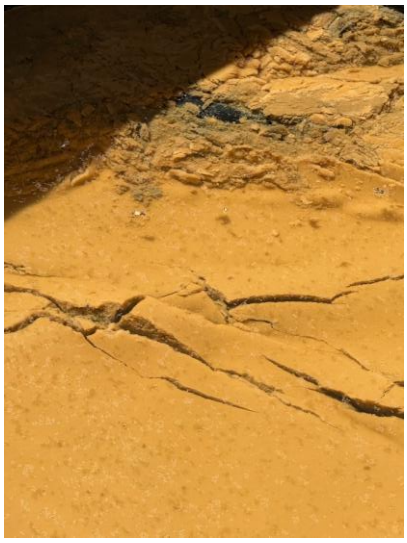
Apple Processing Water Cycle

Untreated (left), Post-AN (center), Post-Twister Polish (right)

Preliminary Screening

AN Coagulation

Post-Settling, Filtration, Twister



Removed Solids

Twister Polishing w/ Ozone

Conclusion

The Twister Enhanced AN™ system demonstrated reliable and efficient treatment of apple processing and equipment wash water. This pilot validates scalability for full-scale integration in fruit and food processing facilities seeking compliance with discharge regulations and improved environmental performance.