



# Foods - BOD & COD

NONAME FOODS manufactures food products and supplements in Washington State. They have a source of well water contaminated by use with vegetable (and apparently fish) oils that they want to re-use. A five gallon sample was received for testing by the KASELCO electrocoagulation process.

The raw sample showed a pH of 5.69 and conductivity of 549  $\mu\text{S}$  (microsiemens) with a milky color and strong fish odor. There was a light oil film at the top.

## Conclusion

This waste is an excellent candidate for treatment using the KASELCO electrocoagulation process. The raw wastewater will not require modification (i.e. no pH adjustment) - it can be processed as it is delivered to the KASELCO EC system.

Standard clarification (solids separation) would be adequate. While the water would not be recommended for use in a product, it would be suitable for discharge or should be suitable for re-use as wash down. The customer must judge whether the final content of the water is acceptable for a given application or disposal.

## Bench Scale Kaselco Electrocoagulation Treatment

**Test #1:** Test as received (raw sample):

The sample was tested without modification in a KASELCO type 05 reactor (based on the low conductivity of the water). The low conductivity accommodated the maximum standard voltage (48 VDC) at the standard treatment amperage. The pH rose from 5.69 to 8.76 at the end of one pass (1B). The conductivity initially rose from 549 to 570 $\mu\text{S}$ , then fell to 528 $\mu\text{S}$ .

There were good visual indicators of treatment. A green floc developed at mid-reactor, but the water retained some of its milky color, now gray. After one pass the floc and suspended solids separated completely, producing clear water with a good, green floc.

The produced solids rose initially, then fell so that top of the settled floc was 10% after 15 minutes and to 7% at one hour. The solids generation rate was 4.5 pounds of dry sludge per 1,000 gallons of water. The solids generation rate was lower than typical for industrial water, but high for water of this low conductivity. The water may contain some chlorides.

Samples were sent to an independent laboratory for analysis of BOD, COD, and FOG. The BOD was reduced from 1,863 to 305mg/l and COD from 2,626 to 458mg/l by the single pass. Oil and grease were lowered from 91.9 to 17.8mg/l. While the O&G removal was less than expected, it is still considered acceptable and may improve with a fresher waste received immediately from process rather than transported cross-country.

## Lab Data - abbreviated

**TEST # 1:** EVALUATE AS-IS (no adjustment to the raw wastewater sample)

PROFILE: pH 5.69. Conductivity 549 $\mu$ S. Appearance is milky white water, slight oil film on top. Run in #05 steel reactor.

<u>PASS</u>	<u>PH</u>	<u>COND</u>	<u>BOD</u>	<u>COD</u>	<u>OIL &amp; GREASE</u>
PROFILE					
1-A	8.04	570	1,863	2,626	91.9
1-B	8.76	528	305	458	17.8

COMMENTS: 1-A gray water, floating green floc. 1-B clear water, floating green floc.

1000ml Wet sludge test. 100ml @ 15 min. 85ml @ 30 min. 70ml @ 60 min.

100ml Dry sludge test. 0.054 g.

OUTSIDE LAB TESTING 10-19-04

## Glossary

- Profile: The characteristics of the waste being tested.
- 1A: Equivalent of half a pass through a full-scale production reactor.
- 1B: Equivalent of one full pass through a full-scale production reactor.
- Type: KASELCO EC reactors come in three electrical configurations and is chosen based on the wastewater's conductivity.