Epner Technology Inc.

Close Loop for Zero Waste Water Discharge

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What’s the Difference?

• Zero Discharge?

• Closed Loop?
Zero Discharge

- **Zero Discharge** is a plating plant or manufacturing plant is the same thing.....

- *Nothing goes to Waste*.... Here are some examples: Paper, Cardboard, Oil, Metal, Metal Salts, Antifreeze, Light Bulbs, Glass, Wood, Cement, Office Tools, Water....

- All is recycled.
Closed Loop

- **Closed Loop** is a system where process waste is returned back to the process to be reused.
• The type of closed loop system E.T.I. uses is a Vacuum Distillation (V.D.) unit. What this unit does is distils the brown water or waste water and sends the clean or distilled water back to the process and the concentrate that is left behind gets filtered to remove the precipitate. The effluent from the filter press goes back to be distilled again and the precipitate gets recycled.
• E.T.I. also “Cogenerates” our own electricity. What this means is we use electricity from the generator but we also use the waste heat from the generator.
• Hence “Cogeneration”.

• The generator runs on natural gas, it is a straight eight, slow turn engine. It puts out 175 kw at 1200 rpm. We also have a 250kw diesel generator which is our backup for the natural gas engine.
• We get a discount on our rate from the gas company because we have the ability to switch to a different fuel when natural gas demand is high.
• E.T.I. not only uses the electricity, but it also uses the heat from the generator to operate our vacuum distillation unit. This makes for an economical energy supply for our Vacuum Distillation Unit.
• How the vacuum distillation unit works.
• There are five circuits in the unit.
• 1. Waste Treatment Circuit
• 2. Clean Water Circuit
• 3. Waste Evaporation Circuit
• 4. Cooling Circuit
• 5. Heating Circuit
Waste Evaporation Circuit

1 – CASTion
2 – Valve
3 – Pump
4 – Filter A
5 – Filter B
6 – Primary Heat Exchanger
Clean Water Circuit

7 – Downpipe
8 – Condenser
9 – Venturi
10 – Clean H2O
11 – H2O Transfer Valve
12 – Clean H2O
13 – Carbon Filter
14 – Valve to Shop
Waste Treatment Circuit

1 – CASTion
3 – Pump
15 – Holding
16 – NaOH
17 – Tank A
18 – Tank B
19 – Press A
20 – Press B
21 – Filter
23 – Feedback Valve
Cooling Circuit

8 – Condenser
24 – Chiller
25 – Holding Tank
Heating Circuit

27 – Generator Water
26 – Secondary Heat Exchanger
6 – Primary Heat Exchanger
28 – Boiler Steam
Waste Evaporation Circuit
1 – CASTion
2 – Valve
3 – Pump
4 – Filter A
5 – Filter B
6 – Primary Heat Exchanger

Cooling Circuit
8 – Condenser
24 – Chiller
25 – Holding Tank
The End