

# WASTE WATER EVAPORATOR FACT SHEET

## SUMMARY

Plants essentially have four options for waste water disposal. These include: discharging into rivers, streams, groundwater and sewers; hauling off-site; using separation technologies; and evaporation.

Most environmental experts agree that evaporation offers industry a simple and effective long-term approach to wastewater disposal. Evaporation has proven to be an excellent solution to solving wastewater disposal and discharge problems for companies who:

- Currently pay for off-site disposal
- Treat wastewater in-house
- Are environmentally-conscious
- Are unable to meet the permissible discharge limits to their sewer facility, live in a rural area and do not have a sewer system to discharge to or want to eliminate sewer discharge liabilities
- Are tired of recycling

Costs of wastewater evaporators range from \$12,000-900,000 but most applications Yankee sales reps will encounter will more likely cost between \$12,000-40,000. The typical selling cycle for wastewater evaporators is one year. Wastewater evaporators typically take 3 days to install, require .5 PSI and have a life expectancy of between 20 and 30 years.

## PRINCIPLES OF OPERATION

Although there are almost as many different configurations for wastewater evaporation systems as there are unique plant locations, most layouts are similar to that shown in Figure 1. Models of wastewater evaporators vary depending on the evaporation rate (gallons per hour) required.

**Typical water evaporator system (Figure 1)**

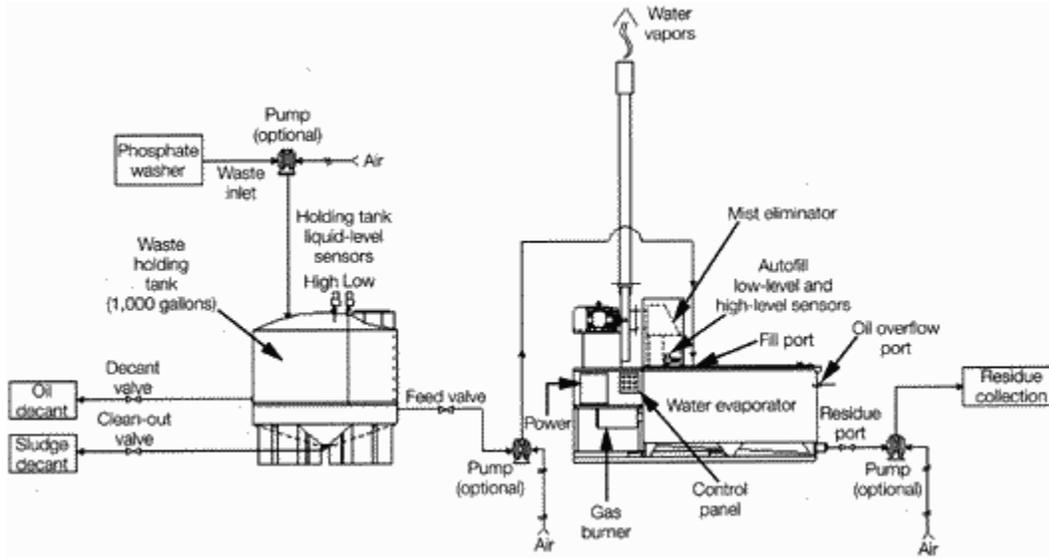


Diagram: Samsco

The wastewater from multiple waste streams is normally fed into a single large waste holding tank. This tank simplifies the removal of floating oils and settled solids from the wastewater. The waste holding tank usually has a low-liquid-level sensor that stops the feed pump when the tank is empty. When required, a high-liquid-level sensor signals when the tank is approaching highest capacity.

The evaporator operates automatically, feeding itself from the holding tank until the end of the evaporation cycle. The automatic fill control on the evaporator continually regulates the feed of wastewater to the evaporator. If the holding tank runs out of liquid, the low-level control interrupts the feed to the evaporator, and the evaporator boils down until its low-level control shuts off the burner. As more wastewater enters the holding tank, the liquid level in the holding tank rises, automatically activating the feed pump. When the level control in the evaporator senses the correct liquid level, the evaporator automatically goes back on line.

At the end of the cycle, an operator opens the evaporator drain valve, starts the drain pump, and empties the residue into either a holding tank or drums for proper disposal. This is routinely the only operator involvement required for a washer and phosphatizing operation.

**STRENGTHS/OPPORTUNITIES**

Wastewater evaporation offers a simple and economical alternative to: recycling - water treatment - ultra filtration. The primary benefit of evaporation as a waste management approach is the substantial reduction in waste volume - typically between 90 and 99 percent. Average costs range from \$0.02 to \$0.08 per evaporated gallon and payback for capital investment is usually within 2-18 months (typically less than 1 year). Here are several *other* reasons why clients buy evaporation technologies:

## WWE Fact Sheet

- *Cost Savings*
  - Lower initial capital cost; lower annual operational cost vs. existing cost for other methods
- *Achieve Environmental Compliance*
  - Requirement to comply with new or existing regulations
- *Facilitate ISO 14001 Certification*
  - Requirement to comply
- *Minimize Hauling Liability*
  - Reduce “cradle-to-grave”
- *Zero Liquid Discharge (ZLD)*
  - No hauling
- *Recycle, Recover and Reuse Pure Water*
  - Recovers up to 99% in single operation
  - Recovers chemicals for reuse
- *Broad-based Application*
  - Single system handles multiple waste streams—not waste stream specific
- *Technical Simplicity*
  - Disposal technology does not require chemical training to operate
  - Entry-level personnel adequate for system operation

Samsco training presentation for Yankee Gas – July 2004

### **WEAKNESSES/BARRIERS**

- Waste component to dispose of (typically 5% or less - not 20%)
- Capital expense
- Higher toxicity = higher disposal costs
- Prospects may not have the 5-7 lbs of pressure required to run natural gas-fired wastewater evaporation technologies
- Process is cumbersome to sell and install wastewater evaporator technology. Approval by Department of Environmental Protection is required before technology can be installed – process can take 3-6 months.

**MARKETS**

Below is a list of the top 30 most penetrated industries using wastewater evaporator technologies, according to Samsco:

<u>Industry</u>	<u>SIC code</u>
1. Motor vehicle parts and accessories	3714
2. Industrial machinery	3599
3. Metal stampings	3469
4. Motors and generators	3621
5. Aircraft engines and engine parts	3724
6. Screw machine products	3451
7. Aluminum die-castings	3363
8. Plating and polishing	3471
9. Aircraft parts and equipment	3728
10. Repair services	7699
11. Machine tool accessories	3545
12. Special dies, tools, jigs and fixtures	3544
13. Nonferrous wiredrawing and insulating	3357
14. Industrial valves	3491
15. Industrial machinery and equipment	5084
16. Bolts, buts, rivets and washers	3452
17. Sheet metal work	3444
18. General warehousing and storage	4225
19. Carburetors, pistons, piston rings and valves	3592
20. Machine tools, metal cutting type	3541
21. Fabricated plate work	3443
22. Electronic components	3679
23. Plastics products	3089
24. Copper rolling and drawing	3351
25. Current-carrying wiring devices	3643
26. Steel wire and related products	3315
27. Pumps and pumping equipment	3561
28. Fasteners, buttons, needles and pins	3965
29. Internal combustion engines	3519
30. Automotive stampings	3465

**COMPETITION**

***On-Site Treatment***

On-site treatment of wastewater does not reduce the volume of effluent. Wastewater must still be sent to sewer, so the facility is still responsible for compliance with sewer regulations. Furthermore, on-site treatment tends to be technically complex. Most treatments are waste-stream specific, and a great deal of care is required to ensure that a particular waste stream receives the proper treatments, in the proper order. A skilled full-time operator may be required to manage the waste stream and to ensure that the system remains in good operating condition.

***Hauling Off-Site***

Hauling off-site appears attractive because it requires no investment in capital equipment and the costs are easily identifiable. Customers pay as they dispose. However, the costs are typically high (range from \$0.30 to \$1.50 per gallon depending on what is being hauled) as are the liabilities associated with it. The company is forever held responsible and liable for the wastewater it generates, a situation known as cradle-to-grave. This risk is potentially staggering. Consequently, because of costs and risks, most companies today don't consider hauling a long-term solution to their wastewater disposal problem.

***Sewer Discharge***

With sewer discharge a regulation becoming stricter all the time, this option is fast disappearing for most shops.

***Electric Wastewater Evaporators***

Electric wastewater evaporators are limited in capacity (8 gallons per hour maximum) compared to natural gas (12-15 gallons per hour). Electric evaporators are installed for two reasons: Conservation and Load Management Fund and an attractive payback period (<2 years).

**MANUFACTURERS**

<b>Manufacturer</b>	<b>Representative</b>	<b>Phone Number</b>
Severn Trent Services (Samsco)	Gary Dixon	(603) 668-7111 ext 37
Trans Clean	Michael O'Rourke	(203) 377-3171 ext 108