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It Pays to Save Water

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Water is not a major production cost for Texas industries. A reduction in water use, however, can result in significant economic benefits for most.

Less water used means:

- Less energy needed to pump and heat water
- Less water to treat
- Less wastewater for disposal.

The entire state can benefit economically from industrial water conservation because it reduces the demand on existing water resources and the necessity for developing new ones.

Texas industries use water for removal of waste heat, production of steam, manufacturing processes such as cleaning and moving products, and plant maintenance. Removal of waste process heat--cooling--in industries such as electrical generating, petroleum refining, and food processing requires large quantities of water and is the single largest water use by Texas industries.

Steam generation is another major industrial use of water. Sixteen percent of all industrial water used in Texas is to generate steam which in turn supplies energy for heating and running turbines as well as many other energy uses.

There are two basic ways industries can conserve water: water can be reused or recirculated and more efficient water use can be adopted.

By spotlighting four large water users who have made recent improvements in their water use efficiency, Texas Water Resources salutes all those Texas industries which have dramatically reduced water use. Ranch Style, Inc., Texaco Amarillo Refinery,

Southwestern Public Service Company, and Schlitz Brewing Company are good examples of what is happening in industries across the state.

The major incentives for these industries to practice water conservation have been:

- 1. The rising costs of energy needed to pump and heat water.
- 2. Recently enacted pollution control laws which raise the cost of treating the water once an industry has used it.
- 3. A desire to locate plants in water scarce areas to take advantage of other economic and natural resources.

RANCH STYLE, INC.

Ranch Style, Inc., in Fort Worth is one of the major food processors in Texas. The 100-year-old company cans chili, rice, and six varieties of beans; it has experienced phenomenal growth since its plant expansion and modernization in 1968.

More recent plant modifications to recycle water have resulted in saving more than 10,000 gallons of fresh water each day.

Water use at Ranch Style was not reduced because of limited or expensive water. Two wells on the plant property are adequate to supply the plant far into the future. The energy costs of heating water and the expense of wastewater disposal, according to Edward Barrera of Ranch Style, were the main incentives for changes in plant operation.

Major water uses at the plant are for sauce and steam. It takes twenty thousand gallons of water per day, 45 percent of all the water used at the plant, to make the sauces which are added to the beans, rice and chili. Another 45 percent of the water used at the plant is for cooking, sterilizing, and cooling the sealed cans in a hydrostatic retort.

Ranch Style's hydrostatic retort is a three-story "box" filled with hot water and steam. Continuous metal conveyors carry thousands of cans simultaneously through hot-water, then steam, then more hot water, and finally into the cooling water. Each can spends approximately three hours inside the retort.

Movement of the conveyor and pressure from the steam displace large quantities of hot water. This overflow, which is approximately 185 deg. Fahrenheit, was piped into the Fort Worth sewer system until three years ago. Since that time it has been recovered, filtered, and then pumped into the tanks holding water to be used in boilers.

The company also recycles steam condensation from the retort and adds this pure water to the boiler makeup water. This addition raises the quality of the makeup water as well as the temperature. Barrera reports that the boilers have improved in performance since the introduction of the recycled water.

Recycling retort overflow and steam condensation has worked well in Ranch Style's particular circumstance, and Barrera feels that any food processor using retorts should analyze how much good hot water is being wasted and figure ways to reuse that water.

"It is really a very simple matter," states Barrera "We did not invest a lot of money in expensive equipment--just three pumps, a balance tank, filters, and a little pipe. It has worked well for us and I'm sure there are others who could adopt similar procedures."

Thanks to water conservation, Ranch Style is sav ing water, energy, and sewage costs.

SCHLITZ BREWING COMPANY.

New procedures which save hundreds of gallons per minute have been adopted at the Schlitz Brewery in Longview.

According to James Bennett, Director of Environmental and Industry Affairs for Schlitz, the Longview brewery uses 50 percent less water per barrel of beer produced than the average for the entire brewing industry.

Several of the conservation measures which have helped reduce water per barrel of beer are:

- Maximum collection of condenser and cooling water.
- Installation of a central circulating tank which accurately controls water usage and eliminates unnecessary usage.
- Reuse of blowdown waters in the dust scrubber serving the grain drying system.
- Cleaning kettles and cookers with hot water from cooling operations.
- Recycling water from final stage of pasteurizer back to first stage.
- Final rinse water for returnable and nonreturnable bottles reused for pre-rinsing returned bottles.
- Reusing water used in final rinse of kegs for pre-rinsing kegs.

Water is readily available in the Longview area, and a new municipal sewage plant is more than adequate to treat the wastewater. Water conservation, however, has paid off the for Schlitz brewery--now the largest brewery in Texas.

TEXACO AMARILLO REFINERY.

The Texaco Amarillo Refinery is located in a semiarid region of Texas where the groundwater supply is being depleted at an alarming rate.

Before expansio n of the plant could take place, Texaco needed a long-range, dependable source of water to meet the projected demand for cooling water and boiler makeup water. Wells which had provided water for the refinery since 1927 were declining in production and could not be depended upon for future growth.

The largest, most dependable source of water for the refinery was determined to be Amarillo municipal wastewater. The amount of wastewater from the city of 150,000 people is more than adequate and is a very dependable source because during water supply shortages, water for municipal use always has a top priority.

A contract between Texaco Refinery and the city of Amarillo outlines the water quality, the volume of water available, minimum usage, and cost. The city restricts the discarding of oil or any toxic materials that destroy the effectiveness of the biological treatment and continuously monitors and controls the quality of the treated sewage. These safeguards are necessary in order to protect the investments made by both the city and the refinery in installing required facilities.

Treatment of the city sewage for reuse begins at the municipal plant with primary and secondary treatment. It includes bar screening, sedimentation, filtration, biological treatment, and chlorination.

Additional water treatment at Texaco is necessary to avoid problems such as corrosion, scaling, deposition, and foaming. The refinery uses a conventional hot lime/soda treatment as well as a cold lime/soda treatment to clarify and soften the water for use in the cooling water system.

Other water conservation measures in operation at the refinery are recovery of condensation from the boilers to add to boiler makeup water and recycling blowdown water into the cooling water system.

Plans for further reduction of the total consumption of water in the plant include:

1. Storm water runoff held and used for fire fighting and cooling of equipment.

2. Pollutants better contained and now allowed to contaminate as much water. This will mean less water sent to the disposal system.

Although treatment of the municipal wastewater is costly, Texaco benefits from a dependable source of water, Amarillo benefits from the sale of its municipal wastewater, and the entire area benefits in having less water pumped from the diminishing groundwater supply.

SOUTHWESTERN PUBLIC SERVICE.

Southwestern Public Service Company of Amarillo is another industry which practices water conservation by reusing municipal wastewater rather than further depleting the area's fresh water source.

Disposal of this water after the power plant has added waste heat to it, however, has been a dilemma.

The solution for wastewater disposal resulted in still further use for the water--irrigation. Southwestern now uses cooling water for irrigating alfalfa and then sells the alfalfa to local cattle feeding operations. At the present time there are 156 acres of irrigated pasture with construction underway on 87 additional acres. Ultimately this program will utilize approximately 700 acres of irrigated farmland to dispose of cooling tower blowdown.

The water is stored in a 35-acre pond and then flooded onto the land for irrigation. Runoff returns to the storage pond. Irrigation continues throughout the year, and from May to October the alfalfa is cut every 30 days. The harvest totals approximately seven tons of alfalfa per acre each year.

Water available for irrigation purposes, at peak load, is around 2,150 gallons per minute, or 1,800 acre feet per year. The evaporation rate is approximately three to six acre feet of water per acre of crop.

The water, high in nutritional value, serves as a fertilizer for the alfalfa. Also, it is warm and is less likely to retard plant growth due to "cold shock" which results from the use of irrigation water pumped from groundwater.

The reasons which prompted the company to initiate projects utilizing cooling tower blowdown for irrigation were the need for compliance with water quality regulations as well as the possibility for using recycled water for conservation purposes.

Currently Southwestern is operating at "no discharge" which means no pollutants are leaving the plant to enter natural waterways. This is in accordance with the Federal Water Pollution Control Act (Public Law 92-500) which established a goal for "zero discharge" of pollutants into navigable waters by 1985.

Who benefits from Southwestern's water conservation? Area fresh water users, energy consumers, and agriculturists are a few who do.