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Big B

Providing Water for Dallas or any other large city is big business.

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Everybody knows Big D is Dallas. Do they know that supplying Big D with water is Big B--Big Business?

Providing water for any large city is big business. Contrary to popular belief, a city water department is not just a team of meter readers, bookkeepers, line repairmen, and a customer complaints department. A complex operation, it requires scientific, technical, managerial, and financial experts; specialized technicians; plus the above-mentioned.

A visit with Dallas Water Utilities director, Dr. I. M. Rice, makes one aware of the scope and complexity of that department. He talks of the $66,000,000 budget for 1977, plans to initiate tertiary sewage treatment, the $50,000,000 revenue bond issue approved by the voters this year, water supply for 1995, and interbasin transfer.

A wall map near his desk graphically verifies the scope. It shows water supply reservoirs, one as far as 40 miles away from Dallas city limits, water treatment and sewage plants located miles from Dallas proper, and--most impressive--the vast geographical area which is served by the Dallas Water Utilities. Dallas has 3,471 miles of water lines and 3,116 miles of sewer pipes. There are over one and one quarter million water and sewage customer accounts in the city's 230 square miles. Only 251 houses in Dallas do not have water meters.

Securing, treating, distributing, and discharging as waste over 185,000,000 gallons of water used daily in Dallas sums up the major objectives of the department. But all 1,700 employees are not involved in actual water and wastewater operations. To keep up with the growing demand, the Dallas Water Utilities must engage in program planning, research and development, financial planning, and engineering and construction.

Planning

"Operation and maintenance of water and sewer--that's our business, of course," commented Rice, "but planning is one of the things we focus on around here. Planning saves us money, allowing us to take advantage of opportunities that arise. For example, right now may be the time to purchase the right-of-way for the pipeline from Lake Palestine. Some day we'll be taking water from there. The right-of- way will be cheaper now than later when residential development occurs, and we might have to detour around a housing development."

Thanks to planning, Dallas has enough water to "carry us through 1995." Traditionally, Rice said, Dallas has had a long range water plan. The big drought in the 1950's prompted the first plan which takes the city through 1995. Now a citizens committee is considering ways to assure water to 2050. Rice said there is not just one absolute plan but a number of alternatives. The choice will depend on opportunities that arise.

"When you plan a water supply, you base it on the worst drought in the area's history," the director explained. The current plan is based on the drought of the fifties. Although the drought from 1921-31 was a longer period, "we didn't have the big demand for water that we had during the drought in the fifties."

"Our present reservoirs will provide a dependable supply of water up to 1995 even in the most severe drought," Rice said. These include Lake Grapevine with 181,109 acre feet capacity; Lewisville Reservoir, 464,547 acre feet; Lake Ray Hubbard, 489,926 acre feet; Lake Tawakoni, 936,244 acre feet; and Lake Palestine, 411,779 acre feet.

Finance

The purchase of Lake Palestine for $10 million, Rice pointed out, is an example of taking advantage of an opportunity. He called it a good buy for Dallas since it was bought at old time prices.

The pipeline from Palestine, however, is a different matter. It will cost between $40 to $50 million to build. Such a large project is financed through the sale of revenue bonds. This year's $50 million bond authorization will go toward financing such pipelines, sewage treatment works, and other facilities.

The $66 million budget for 1977 is an increase of $4 million over last year's. About half of the funds will go for debt retirement of outstanding bonds, most of which were incurred 20 years ago. Rice attributed the budget increase to higher cost of power and chemicals, salary increases, and expansion of a sewage treatment plant.

According to Rice, the Dallas Water Utilities is fully revenue-financed. There is no money received from the general fund. All income to the water department is from sale of water and sewer service and can be spent only for water and sewer service.

Rice said that the water department is not a profit-making organization. Rates, he said, are increased from time to time (last water rate increase was in 1969) in order to provide income sufficient to meet increasing expenditures. The remaining revenues at the end of each year are used for capital improvements.

"This relieves us from having to borrow money and pay interest for all of our capital improvements," he continued. "After the rate has existed for a while, no cash is generated; and it is necessary to sell bonds to finance improvements. That's the position we're in now. When we reach a point where we can't sell any more bonds because we can't retire the debt, we have to have another rate increase. Hopefully, we can go a number of years between rate increases. We try to strike a balance."

As for rates, Rice reported that the price of water in Dallas proper has not changed much since the water department started back in the 1880's.

"The charge is 50 cents a thousand gallons to users of more than 8,000 gallons--about the same as the charge back then. Really, that makes it a whole lot cheaper today because 50 cents in 1885 was worth more money than it is now," he reasoned. "You're also getting more for your money because in those days surface water had very little treatment. It was just pumped out of the river and distributed to the homes."

The Water Utilities office recently conducted a survey of monthly water rates charged in 36 municipalities in the Dallas area (14 of which are Dallas water customers) and found that Dallas is one of the cheapest places to buy water. Cities are ranked on the basis of minimum rates charged for six levels of consumption: 1,000 gallons, 5,000, 9,500, 25,000, 50,000, and 1,000,000.

The Dallas rate for 1,000 gallons is the cheapest at $1.56; the highest in the survey is $5. The average Dallas domestic consumer pays $6.37 for 9,500 gallons; whereas the highest charge for that amount is $14.23. The cost to a Dallas industry for 1 million gallons is $420; the highest charge is $807.47.

18 Divisions

Another visual key to the huge Dallas Water Utilities operation is the table of organization chart. There are 18 divisions: administration, personnel, program planning and management services, research and development, operations analysis, engineering, accounting and finance, commercial, pumping, wastewater treatment, water purification, reservoirs, construction, stores, wastewater collection, water distribution, plant maintenance, and metering activities.

With a professional task force like that dedicated to supplying a city with ever-available high quality water, it's no wonder that urban water users, when asked where their water comes from, answer complacently, "From the tap, of course."

Dallas Water
. . .From Collection to Discharge

The first municipally-owned water supply in Dallas was acquired in 1881 when the population was slightly more than 10,000. Ninety- five years, and a lot of pipes, pumps, and purification plants later, the Dallas Water Utilities serves 1,276,000 people, whose consumption normally exceeds 185 million gallons per day (MGD), and may in a single day exceed 430 million gallons per day.

Source

Five lakes supply this enormous demand: Lewisville Reservoir on the Elm Fork of the Trinity River; Grapevine Reservoir on Denton Creek; Lake Tawakoni on the Sabine River about 40 miles from Dallas; Lake Ray Hubbard on the East Fork of the Trinity; and Lavon Reservoir, a part of the North Texas Municipal Water District, which provides the northeast section of Dallas 10 million gallons a day.

Treatment

The impounded water is brought to one of three treatment plants and lifted to the first-stage treatment units. The three plants are Elm Fork (plant capacity 180 MOD), East Side (200 MGD) and Bachman (120 MOD). Water from Lewisville and Grapevine flows in natural stream beds to plants. Lake Tawakoni water is pumped 18 miles through a 60-inch pipeline to a 266 MG holding basin on a ridge separating the Sabine East Fork watersheds. Then it flows by gravity another 19 miles to treatment. Lake Hubbard water is pumped directly to the East Side plant.

Treatment removes mud, bad taste and odor, and microscopic organisms (bacteria, molds, viruses, and algae). Seven chemicals are applied. Activated carbon adsorbs organic matter and controls tastes and odors. Chlorine has several functions. It kills bacteria, prevents algae growth, oxidizes organic matter, and controls fishy or sulfurous odors. Lime, the cheapest chemical and the hardest worker, softens water, helps settle out suspended matter, and adjusts alkalinity. Ferric sulfate is the chief clarifying agent; and fluosilic acid, the fluoridating agent. Sodium hexametaphosphate controls scale and corrosion on pipes. Amonia makes the taste of chlorine less noticeable.

Each plant has a complete laboratory staffed by graduate chemists who make 17,160 tests each month. Also tested are chemicals, construction materials, paints, and petroleum products. Tests are conducted to make sure all contract specifications are met.

Distribution

After water is purified, it is stored in one of nine strategically located reservoirs which hold a total of 138.7 MG of treated water. High pressure pumps boost the water into the

distribution system under enough pressure to deliver to customers miles and miles away. Pumping stations and treatment plants are manned 24 hours a day.

Pipes as large as 90 inches in diameter and as small as 2 inches carry the treated water through the distribution system. In order to control the flow of water, direct it to the proper areas, and control the pressure there are 32,000 valves. Eight elevated tanks are used to soak up the excess pumpage and provide an additional 10.5 MG storage. This makes efficient distribution possible throughout the city even during peak consumption periods. Regular crews work around the clock operating valves, flushing lines, repairing breaks, and turning on water for new customers. The distribution division has personnel trained to operate key valves to save great water loss in the event of disaster.

Consumption and Disposal

The next step is turning the user's tap. With that gesture the water starts a new cycle. Disposal. Dallas Water Utilities is back in business: operating and maintaining the sanitary sewer system, pumping sewage, and treating domestic and industrial waste waters.

Today Dallas has the biggest single wastewater treatment plant in Texas. It is also the first major plant providing tertiary treatment. That's one step beyond what many cities in other parts of the country are just now achieving. By 1983, this will be required of all cities in the United States in order to meet the zero stream pollution demands of EPA.

The $38 million advanced treatment plant will discharge, as Director Rice puts it, "some pretty darn good water into the Trinity."