

One of three final clarifiers  
at the Manchester plant.



THE MANCHESTER (WASH.) TREATMENT PLANT HAS WON THE STATE DEPARTMENT OF ECOLOGY OUTSTANDING PERFORMANCE AWARD FOR A RECORD 15 STRAIGHT YEARS

# Super Achiever

By Trude Witham

IT'S SOMETHING TO BE PROUD OF WHEN A PLANT wins an award. But when it wins that award year after year, that's special.

That distinction belongs to the Manchester (Wash.) Wastewater Treatment Plant, a 0.46 mgd facility that is one of four owned by Kitsap County. It has won the state Department of Ecology's outstanding performance award for 15 years in a row and is the only plant in the state to earn a perfect score since the department began honoring top performers in 1995.

To receive a perfect score, a plant must consistently meet every condition of its permit, take every water sample, and pass every on-site inspection. Located in a community of 2,400 residents, the plant serves light industry, Manchester State Park, a U.S. EPA laboratory, the Northwest Fisheries Science Center (a National Oceanic and Atmospheric Administration research facility) and the Manchester Naval Fuel Depot.

## WINNING TEAM

Lead operator Don Johnson, one operator and a rotating operator staff the Manchester activated sludge plant. Johnson also oversees the county's Kingston (oxidation ditch) and Suquamish (sequencing batch reactor) wastewater treatment plants.

The Kingston plant has won a Department of Ecology Outstanding Wastewater Treatment Plant Award every year since it was rebuilt in 2005. The Suquamish plant has a perfect operating record since its upgrade in 1998.

Besides Johnson, the operations staff for the three plants includes:

- Mick Durham, operator II, 18 years of wastewater experience, all with Kitsap County
- Brian Fletcher, operator II, 15 years, 12 with the county
- Ken Young, operator II, 13 years, 10 with the county
- Wes Cotant, operator I, six years, all with the county. He assists one day at each of the three plants during the week and covers all three plants on weekends.

With a Group IV certification and 24 years of experience, all with Kitsap County, Johnson is up to the task of running the facilities, although he credits the county and his staff for the plant's success. "We have a lot of support from the county, which has 60 full-time employees in the wastewater division," says Johnson. "There is a main plant that serves central Kitsap, and then three outside plants, which I serve."

The successful operations at the plants are supported by many skilled colleagues at the central plant: facilities maintenance staff, mechanics, electricians, instrument technicians and lab staff. These 22 full-time employees are responsible for the treatment plants as well as 60 lift stations. The central plant also has six operators.

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**DON JOHNSON**

## SOUND MAINTENANCE

One factor that has kept the Manchester team intact for so long is the excellent condition of the plants, which are up to date and well maintained. "Our staffing levels have remained stable in a time when private sector and government employment has been less sound," Johnson says.

Operators work 7 a.m. to 3:30 p.m. Monday through Friday. During off-hours, a dial-up alarm system notifies on-call operators of any problems. A small on-site lab performs daily tests such as pH and dissolved oxygen. The main Kitsap County lab conducts all other tests.

Don Johnson, lead operator at the Manchester Wastewater Treatment Plant.



# profile



## Manchester (Wash.) Wastewater Treatment Plant

<b>BUILT:</b>	<b>1969; upgrades 1991, 1998</b>
<b>POPULATION SERVED:</b>	<b>2,400</b>
<b>EMPLOYEES:</b>	<b>3</b>
<b>FLOWS:</b>	<b>0.46 mgd design, 0.21 mgd average, 0.99 mgd peak</b>
<b>TREATMENT LEVEL:</b>	<b>Secondary</b>
<b>TREATMENT PROCESS:</b>	<b>Activated sludge</b>
<b>RECEIVING WATER:</b>	<b>Puget Sound</b>
<b>BIOSOLIDS:</b>	<b>Trucked off site and land-applied or composted</b>
<b>WEBSITE:</b>	<b><a href="http://www.co.kitsap.wa.us/www/manchester.htm">www.co.kitsap.wa.us/www/manchester.htm</a></b>
<b>GPS COORDINATES:</b>	<b>Latitude: 47°33'31.73"N; Longitude: 122°32'43.36"W</b>

The Manchester plant, built in 1969 with primary treatment, was operated by a local utility district until 1976 when Kitsap County took it over. In 1991, the plant was upgraded to an SBR secondary treatment facility, and in 1998 to a conventional activated sludge process to increase capacity.

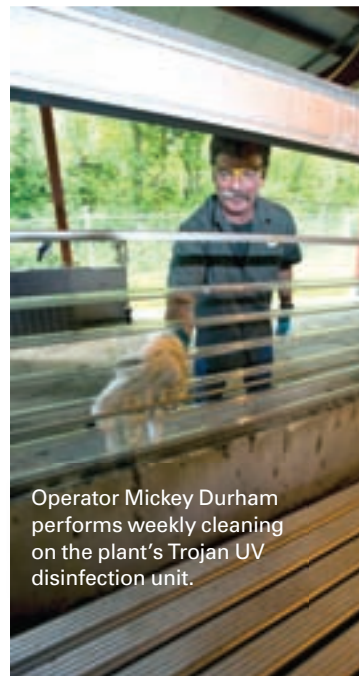
## ROTATION PROGRAM

Don Johnson, lead operator at the Manchester Wastewater Treatment Plant, believes in rotating his staff among the three Kitsap County plants for which he is responsible. He initiated the concept 11 years ago.

“When I started the rotation of operators, the main reason was to periodically consider plant operations with a fresh perspective and encourage new ideas,” Johnson says. “The three plants I supervise are smaller operations, all less than 0.5 mgd, and I wanted to keep the duties from becoming routine.”

Operators have readily accepted the program. One operator may prefer one plant or another, but Johnson doesn’t see that as a disadvantage. Instead, it fosters an amiable rivalry, encouraging operators to advance in skills and knowledge. “The operators are in constant contact with each other, promoting teamwork,” Johnson says. “They know I am not likely to challenge well-considered decisions, so they are not frozen in place.”

With the rotation program, all the operators share in the success. “Everyone is proud of the awards the plants have won because they have all contributed to earning them every year,” Johnson says.



Operator Mickey Durham performs weekly cleaning on the plant's Trojan UV disinfection unit.

The 1998 upgrade provided a return activated sludge (RAS) pump station in which the pump drew from the two secondary clarifiers at the same time. The withdrawal rates were not easily equalized, and that led to unbalanced solids inventories in the clarifiers. To correct that, county personnel divided the RAS pump station into two pump wells in fall 2010. An RAS pump with variable-speed control is now dedicated to each clarifier.

Wastewater flows to the influent pump station and is delivered via three 10 hp Myers submersible pumps to the headworks, consisting of a rotary bar screen with integral dewatering (Lakeside Equipment). From there, the wastewater is sent to a Smith & Loveless vortex grit chamber and a Weir Specialty Pumps/WEMCO Pump grit classifier with cyclone. It then flows by gravity to two parallel Jet-Tech aera-

tion systems (Siemens) powered by three Dresser Roots 15 hp positive displacement blowers.

The 0.126 mgd aeration basins are the retrofitted SBRs. The mixed liquor flows from the basins and is split between two 35-foot-diameter Ovivo final clarifiers. It then flows to a low-pressure, low-intensity TrojanUV disinfection system. The final effluent is discharged 880 feet from the shore of Puget Sound, 60 feet below the low-tide point.

The plant dewateres the biosolids to 4 percent solids with an Ashbrook gravity belt thickener. Solids are trucked to the Central Kitsap Wastewater Treatment Plant for anaerobic digestion and dewatering. The biosolids are transported to a contractor for land application or composting.

“We focus on controlling the quality of the activated sludge, and each day we have a protocol to assess solids inventory. We want to know how much we have, where it is, how long it has been there and how it is behaving.”

**DON JOHNSON**

**FORMULA FOR SUCCESS**

“There is no secret formula, no precise mixed liquor suspended solids sweet spot, no ideal RAS/Q (return activated sludge flow to sewage flow) ratio,” says Johnson. “We do what I imagine successful treatment plant operators around the world do. We have well-designed facilities and infrastructure, which we keep clean, well maintained mechanically, and safe.

“We focus on controlling the quality of the activated sludge, and each day we have a protocol to assess solids inventory. We want to know how much we have, where it is, how long it has been there and how it is behaving. But beyond facilities and protocols, it is the staff that makes a treatment plant successful.”

Johnson’s philosophy as a leader is another reason for the plant’s success. “We have an outstanding team of talented operators who are given the responsibility for recognizing and dealing with operational issues,” he says. “My role is to provide whatever support they need to fulfill their responsibilities.”

**STEPPING UP**

The Manchester plant’s path to success has not been without challenges. “The evolution of the plant from primary treatment to sequential batch reactor to conventional activated sludge presented challenges, as the treatment processes are very different,” says Johnson. Other challenges included keeping current with technology.

Training has helped. As part of each plant upgrade, manufacturers have been required by contract to provide comprehensive training to the staff on operating and maintaining all equipment. New operators work under experienced operators to gain specific skills and competency.

The Department of Ecology requires continuing education to maintain operator certification. Operators attend annual conferences, workshops and short schools sponsored by the Pacific Northwest Clean Water Association (PNCWA) and Washington Wastewater Operator Workshops. Monthly safety

**Manchester Wastewater Treatment Plant  
PERMIT AND PERFORMANCE**

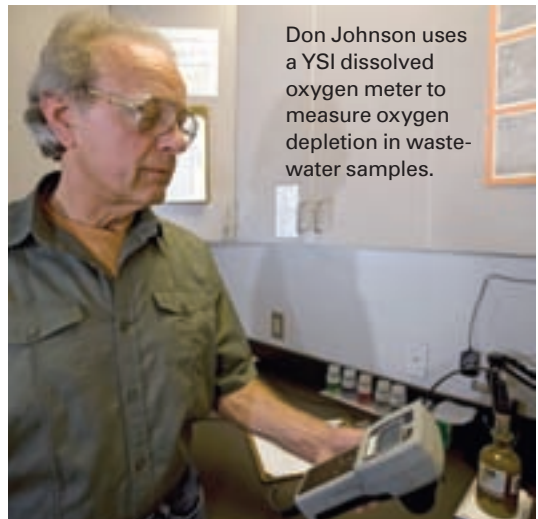
	<b>INFLUENT (monthly average)</b>	<b>PERMIT (monthly average)</b>	<b>EFFLUENT (monthly average)</b>
<b>BOD</b>	210 mg/l	30 mg/l	4.0 mg/l
<b>TSS</b>	230 mg/l	30 mg/l	5.5 mg/l
<b>Fecal</b>	—	200/100 ml	3/100 ml
<b>Ammonia</b>	26 mg/l	N/A	3.5 mg/l

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Operator Mickey Durham, left, and lead operator Don Johnson, wash down a pump at the influent pump station before pulling the pump for inspection.

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“There are many changes in the industry, and it’s important to pursue energy efficiency and create reusable resources.”

**DON JOHNSON**

meetings also include training in related subjects.

Johnson is a member of the Water Environment Federation and PNCWA and attends annual conferences and workshops. “I have found value in their website technical forums and Web-based seminars,” he says.

### FUTURE CHALLENGES

A key future challenge is movement toward water reclamation.

Located on the Kitsap Peninsula in the Puget Sound region, Manchester depends on groundwater for drinking. With a growing population, that source could become depleted. In 2009 the county adopted a policy that water is a resource that needs protection.

“The county is studying reuse as a way to enhance wetlands,” says Johnson. “At present, there is no timetable for upgrading the Manchester plant for reclamation, but I have been involved with some studies of that nature for the Kingston plant.”

The Manchester plant may need a capacity upgrade. “When we upgraded in 1991, it was supposed to be sufficient for 15 years, but by 1998 we were already exceeding growth expectations,” says Johnson. “It has leveled off a bit now, but who knows what the future holds?”

Johnson believes operators should be ready for change. “My advice is for them to remain adaptable and up to date,” he says. “There are many changes in the industry, and it’s important to pursue energy efficiency and create reusable resources.”

Whatever changes may come for the Manchester plant, one thing is certain: the operators will strive to maintain their success. Says Johnson: “Our goal is to continue to operate the plant safely and efficiently while protecting public health and the natural water resources.” **tpo**

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