

PW/Utilities Connection



October 2007

Utilities Data from Sept. 2007 City of Melbourne Public Works & Utilities Department

Ozone treatment start-up underway at surface water plant

Water treatment using ozone is the star of the Phase II improvements at the City's surface water treatment plant, with extensive testing underway this month as start-up is set to begin.

This two-year, \$15 million improvement project includes construction of an ozone treatment system that will be used for disinfection and taste and odor control. Regulatory requirements for disinfection are becoming more stringent and the new treatment system will allow the City to meet the new standards.

Images of old-time science fiction movies come to mind as ozone generation is set to start. One can picture a professor with his beakers and tubes as he creates lightning in a bottle for his invention. Not unlike that image, ozone is generated by applying a high electrical current to a stream of pure oxygen. The high-voltage electricity splits the oxygen molecule or O_2 into individual oxygen atoms. These are then recombined to form ozone or O_3 .

Prior to beginning ozone feed there are numerous steps that must occur. These include a complete mechanical and electrical systems check, instrumentation calibrations, and safety system tests. All of these new systems must integrate with existing processes and work flawlessly before the equipment is started. During these tests and equipment start-up City staff will receive vital training related to safety, equipment maintenance, and new process operations.

"There is quite a bit of training that still needs to be done," said Water Production Superintendent Fred Davis. "The operators will be working with Ozonia (manufacturers of the ozone equipment). There will also be extensive training with the electricians and the mechanics on the new equipment."



George Varall (left), of Hazen & Sawyer, and Martha Campbell inspect one of the ozone generators.

One of the most important tests yet to be completed is a fluoride tracer study of the new ozone contactor tanks. In the tracer study, fluoride is injected at the beginning of the ozone contactor tank and the time it takes for the fluoride to reach the end is timed. Once this time through tank, referred to as contact time or CT, has been determined the disinfection efficiency can be established with state and federal regulators.

"The DEP (Florida Department of Environmental Protection) will review the tracer test results and hopefully, will confirm those results to include them into the permit conditions granting the disinfection credit," said Martha Campbell, Assistant City Engineer

who serves as the City's project manager for the construction.

In addition to the ozone treatment systems, the Phase II Improvement Project has included a number of other elements



A bubble test is performed in the contactor to verify the diffusers are operating correctly.

that have been completed and are in operation.

These include the rehabilitation of the raw water intake structure on Lake Washington, building a new south raw water pump station, improvements to the backwash recovery system, and new chemical feed systems.

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Monthly Water Usage and Raw/Finished Water Quality Statistics

Water Usage

- ◆ Water pumped to service: 434,096,000 gallons or 14.47 MGD average
- ◆ Maximum finished water pumped to service: 15.391 MGD on Sept. 1, 2007
- ◆ Fire hydrant flushing: 18,168,465 gallons
- ◆ Committed capacity: 3.6826 MGD
- ◆ Capacity available for development: 7.5853 MGD (Based on 12-month average daily flow)

Water Quality Statistics

Lake water

- ◆ Level: 14.31 feet above MSL on Sept. 30, 2006 (Prior month comparison: 14.24 feet on Aug. 31)
- ◆ pH: 7.8
- ◆ Alkalinity: 66 mg/L

- ◆ Total hardness: 123 mg/L
- ◆ Chlorides: 80 mg/L
- ◆ Color: 412
- ◆ Total dissolved solids (TDS): 313 mg/L

Well water

- ◆ pH: 7.8
- ◆ Alkalinity: 120 mg/L
- ◆ Total hardness: 667 mg/L
- ◆ Chlorides: 812 mg/L
- ◆ Color: 6
- ◆ Total dissolved solids (TDS): 1,700 mg/L

Finished water - pumped to service

- ◆ pH: 8.5
- ◆ Alkalinity: 34 mg/L
- ◆ Total hardness: 86 mg/L
- ◆ Chlorides: 68 mg/L
- ◆ Color: 2
- ◆ Total dissolved solids (TDS): 281 mg/L

New water distribution equipment to make job easier, better

Thanks to recently-purchased equipment, exercising water valves won't require as much exercise by water distribution field workers.

To open a valve using the traditional manual valve wrench, the rule of thumb is to multiply by three the diameter of the pipe for how many turns it will take. For example, a six-inch pipe would require 18 turns, a 12-inch pipe would need 36 turns, and so on.

Hydraulics will soon replace brute force thanks to the new trailer-mounted valve exerciser, purchased from the E.H. Wachs Company for \$45,000.

This multi-tasking equipment will not only open valves, but it will also record the information at each valve to develop a database on how many turns are required and the torque it takes to open them. It comes equipped with a Trimble GPS unit to record all the information for downloading on the City's computer system. In addition, it is equipped with a built-in vacuum system to clean mud and dirt from the valve boxes for easier access, and it comes with a pressure washer.

"We have several thousand valves," said Water Distribution Supervisor Mike Verostic. "They all need to be exercised yearly to ensure they are working properly."

Water valves allow for isolation as needed to repair leaks or perform other work on the water lines, including the flushing program.

Using the new equipment, the operator will attach the valve key to the valve. It then applies 50 pounds of torque, or whatever setting is required, as it works the valve loose. The depth of the valves varies, from a foot deep to six or eight feet below grade, and even deeper.

The new equipment will be put into service toward the end of the month. Before then, Fleet Management staff will go over it thoroughly and apply the City of

Melbourne markings to it. Staff will also receive training by the manufacturer's representative before it is put into service.

Verostic plans to assign two workers to the machine but will require that all in the division become familiar with it.



Mike Verostic examines new equipment.

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Wastewater Treatment Operational Summary and Reuse Statistics

D.B. Lee WWTP

- ◆ Treated this month: 134.22 MG
- ◆ Treated daily: 4.47 MGD
- ◆ Reuse production — total month flow: 66.11 MG
- ◆ Reuse average daily flow: 2.20 MGD
- ◆ Reuse number of days run: 29
- ◆ Plant efficiency, BOD removal: 99.40%
- ◆ Committed capacity: 1.0320 MGD
- ◆ Capacity available for development: 1.8105 MGD
(Based on 12-month average daily flow)
- ◆ Rainfall: 7.29 inches over 15 days

Grant St. WWTP

- ◆ Treated this month: 95.08 MG
- ◆ Treated daily: 3.17 MGD
- ◆ Reuse production — total month flow: 5.04 MG
- ◆ Reuse average daily flow: 0.17 MGD
- ◆ Reuse number of days run: 30
- ◆ Plant efficiency, BOD removal: 99.04%
- ◆ Committed capacity: 1.5404 MGD
- ◆ Capacity available for development: 1.0680 MGD
(Based on 12-month average daily flow)
- ◆ Rainfall: 7.28 inches over 16 days

A total of 71.5 million gallons of reclaimed water was produced during September, representing 31 % of total plant flows.

Regional biosolids study shows feasibility, enters Phase II

Anticipated regulations by the Florida Department of Environmental Protection (FDEP) will require a higher level of treatment of wastewater sludge, or biosolids, one of the end products of the treatment process.

Biosolids are nutrient-rich organic materials. Through advanced treatment, the biosolids are processed to reduce or eliminate pathogens and metals, minimizing odors to form a safe, beneficial agricultural product.

Biosolids treated to this level can be applied as fertilizer to improve and maintain productive soils and stimulate plant growth.

Most wastewater facilities in the county, including Melbourne, provide a lower level of treatment that allows it to be disposed by land application on pasture fields.

FDEP rule making, along with state and county prohibitions, will be eliminating much of the land application in Florida, thus requiring the advanced treatment. This would require significant modifications to the biosolids-handling portion of the City's two wastewater treatment facilities. Relative to the small amount produced, these



Biosolids treated for fertilizer.

modifications would be very costly.

To combine resources, the City of Melbourne participated in the Regional Biosolids Feasibility Study.

The study looked at the potential to pool sludge to make it economically feasible. Phase I has recently been completed and a Phase II study was approved by City Council at their October 9 meeting. Participants also include the cities of Palm Bay, West Melbourne, Rockledge, Cocoa, Cape Canaveral, Cocoa Beach, Titusville, and Brevard County.

In the first phase of the study, Baskerville-Donovan, Inc. (BDI) showed that a regional residual drying

system is cost-effective if the facility is located adjacent to the Brevard County Landfill in Cocoa, and if the cost of using the methane from landfill gas is minimal.

Phase II will look at the landfill methane gas, and/or the potential waste heat from electrical generation system. This would be the energy source for the drying system. Melbourne's prorated share of the cost of the study is \$10,058.

Streets and Stormwater Management Monthly Summary

- ◆ Daytime street sweeper — hours run: 162
Cubic yards of material removed: 334
- ◆ Nighttime street sweeper — hours run: 111.5
Cubic yards of material removed: 112.5
- ◆ Asphalt repairs made: 30
- ◆ Tons of asphalt used: 24.13

- ◆ Feet of canals cleaned mechanically: 3,285
- ◆ Acres treated through aquatic spraying: 21
- ◆ Feet of storm drain pipe repaired/replaced/lined: 81
- ◆ Concrete repairs: 23
- ◆ Cubic yards of concrete used: 34.5

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Bernie Neanover promoted to foreman in Water Distribution

Supervisory staff in the Water Distribution Department are breathing a collective sigh of relief thanks to a recent promotion. Bernie Neanover has been selected to fill a vacant and critically-important foreman position that had been in limbo for months. This was due to a lingering illness and then the passing away of Cecil "Jr" Runion, who had been one of three foremen in the department.

Neanover, who has been with the City for 18 years, has worked his way from Maintenance Worker I, II, up to Utility Service Worker, before his current promotion. He says he is very excited about this new opportunity and plans to put his strong organizational skills to task.

"He's come to me with fresh ideas," said Assistant Superintendent Bill Spann.



Bernie Neanover

What's Done, What's Underway and What's Coming Up

Water Projects

Under Construction:

- ◆ Phase II surface water treatment plant (SWTP) improvements, \$11,322,000
- ◆ Rehabilitation to RO wells #1, 2 & 3, \$692,725
- ◆ Backup well #4, \$1,320,900
- ◆ Harlock Rd water main extension
- ◆ Country Road annexation water line extension
- ◆ Eau Gallie water line replacement, Phase I, Segments V & VI, \$336,800
- ◆ Hallwood waterline replacement, \$158,200
- ◆ 2007 misc. water line replacements - Phase I (Ballard Park)
- ◆ 2006 misc. water line replacements

Under Design or in Bid

Process:

- ◆ Automatic transfer switch and generator enclosure at the SWTP's belt press building
- ◆ Pineda Causeway 16" water main
- ◆ Wickham Road 8" water main
- ◆ Eau Gallie water line replacement, portion of segments I & II, Phase II
- ◆ Water line upgrade at Turtle-mound Rd.-Grand Haven subdivision
- ◆ 2007 misc. water line replacements (Phase II - Ballard Park)

- ◆ Survey and easement clearing for 30" water main at Jones Road between John Rodes Blvd. & Ellis Road (Phase III)
- ◆ North water treatment plant demolition
- ◆ Scrubber blow down pump station and force main
- ◆ Pineda tank and booster station

Wastewater Projects

Recently Completed:

- ◆ St. Andrews lift station and sub-aqueous force main
- ◆ Lift Station #55 upgrade, \$159,564

Under Construction:

- ◆ Various manhole rehabilitation projects, \$274,340
- ◆ FY '07 CIPP rehabilitation projects, \$1,200,000
- ◆ Water & Wastewater Operations maintenance building, \$571,800
- ◆ Electrical upgrade to the sludge belt press building at D.B. Lee and Grant Street WWTPs, \$406,900
- ◆ Crane Field reuse project
- ◆ FIT/Leonard Weaver wastewater collection rehabilitation, \$2,100,000
- ◆ D.B. Lee WWTP admin. bldg.
- ◆ Lift Station #46 (BCC) renovations

Under Design or in Bid

Process:

- ◆ Reuse master plan, phase II
- ◆ Lift Station #29 (Aurora & Mary-wood) Grant Place L.S. and force main
- ◆ Sarno Road force main improvements
- ◆ Grant Street WWTP admin. bldg.
- ◆ Hibiscus Blvd. reuse project
- ◆ Nasa Blvd. reuse project

Streets & Stormwater

Projects

Recently Completed:

- ◆ FY '06 CIPP pipe rehabilitation projects, \$855,000
- ◆ Melbourne Avenue drainage at Pennwood Avenue, \$184,290

Under Construction:

- ◆ FY '07 CIPP pipe rehabilitation projects, \$1,350,000

Under Design or in Bid

Process:

- ◆ Babcock and Hibiscus intersection improvements
- ◆ Gramling Park Road drainage improvements

For more information about this report, please contact the Melbourne PW/Utilities Administration Department at (321) 674-5761 or e-mail utilitiesadmin@melbourneflorida.org