



Metro Interceptor

A PUBLICATION
OF THE MADISON
METROPOLITAN
SEWERAGE DISTRICT

SEPTEMBER 2010

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DOWN THE PIPE

After a summer of nearly unbearable heat and humidity, fall has finally arrived. This past summer posed a special challenge to many District employees - the cooling system for the Operations Building experienced a major equipment failure. This 28-year old system has had problems in earlier years, but never more than this year. With some of the most demanding weather conditions we've seen in years, we lost nearly 2/3 of the building's cooling capacity due to this equipment failure. The Operations Building cooling system has a rather long parts supply cycle. This resulted in several months of inadequate cooling. We appreciate the patience of many in dealing with the poor conditions, especially employees working in the lab. We have started a project to replace and upgrade the heating, ventilating and air conditioning systems of the Operations Building to create a better working environment for the future.

The normal cycle of projects continues. We move forward in large steps with some work that puts entirely new processes and equipment on line and also spend a lot of time repairing and replacing older systems to assure they can

continue to provide required service. The work accomplished on a number of projects is highlighted within this issue of the Metro Interceptor, but as always, there are many other projects that don't make it into these pages. In addition to the projects described in this issue, others deserve special mention. The summer's interceptor sewers cleaning and televising project was recently completed by Sewer Maintenance staff; our document management system, On-Base, has recently been upgraded; several of the plant's final clarifier tank mechanisms have been stripped and recoated; the Metrogro crew has done an outstanding job transporting biosolids and managing their beneficial reuse; design work on the 11th Addition proceeds; and work continues on process research.

While we keep our facilities operating, we wish two employees a wonderful retirement.

To all the contributors to this Metro Interceptor, we thank you. We wish everyone a wonderful fall.

Matt and Jon



OUR MISSION STATEMENT

To protect public health and the environment by providing exceptional wastewater conveyance, treatment and related services.

Phosphorus, MedDrop

phosphorus

15

P

30.974

PHOSPHORUS RULES: WHERE DO WE GO FROM HERE?

Many articles have appeared in the *Metro Interceptor* in recent years over impending changes to Department of Natural Resources (DNR) phosphorus rules in Wisconsin.

Several pieces of the phosphorus puzzle are finally starting to fall into place. The DNR Board recently adopted revisions to administrative code rules that establish water quality criteria for phosphorus and a framework for implementing the criteria for point dischargers such as the District. The District will need to significantly reduce phosphorus discharges to comply with the revised administrative code requirements and the anticipated Rock River TMDL requirements after our WPDES permit is reissued in 2016.

Three basic approaches could potentially be available to the District to comply with the administrative code and TMDL requirements:

- Construct necessary improvements at the Nine Springs Wastewater Treatment Plant
- Fund pollutant trades with other sources of phosphorus in the watershed
- Implement a combination of the two approaches

Determining how the District should proceed is a business and engineering decision that will be based on cost and risk management considerations. The District has formed a workgroup to provide assistance in evaluating local opportunities and mechanisms for phosphorus trading. The workgroup will meet monthly during the next year. DNR is also forming a

workgroup that will be tasked with providing input on developing a statewide framework to support pollutant trading. District staff will participate in the DNR initiative. Both efforts will help the District make an informed business decision regarding how to best achieve required phosphorus reductions.

Dave Taylor

“Looking Forward”

Some Important Milestones in Phosphorus Reduction Future

- Late 2010 — EPA approves numeric water quality criteria for phosphorus and accompanying implementation strategy that were adopted by the DNR Board.
- Late 2010 — Rock River Phosphorus TMDL finalized and work begins on developing an implementation plan.
- Late 2010 — District forms workgroup to help evaluate local opportunities and mechanisms for phosphorus trading.
- 2016 — District’s discharge permit is reissued and includes both a water quality based effluent limit for phosphorus and a compliance schedule.

“Looking Back”

Some Important Milestones of Phosphorus Reduction History

- Pumping Stations 6 & 8 Rehabilitation
- 1979 Wisconsin institutes initial restrictions on detergents containing phosphorus.
- 1992 DNR establishes phosphorus effluent standards and limitations for point dischargers.
- 1997 MMSD begins biological phosphorus removal, resulting in a 90% reduction in effluent phosphorus levels.
- 2000 EPA publishes recommended phosphorus water quality criteria.
- 2006 Work begins on the Rock River Phosphorus TMDL.
- 2009 Governor Doyle signs bills placing restrictions on lawn fertilizers and dishwashing detergents containing phosphorus.
- 2010 DNR Board adopts numeric water quality criteria for phosphorus and accompanying implementation strategy.



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PCS Upgrade, East Blower

PROCESS CONTROL SYSTEM UPGRADE

Earlier in 2010, MMSD staff along with engineers from Camp Dresser & McKee, Inc. (CDM) of Milwaukee, initiated a facilities planning project to investigate alternatives for upgrading or replacing the plant process control system (PCS). Some hardware and software of this system is nearing the end of its useful life in terms of compatibility and maintainability.

Throughout the spring and early summer, investigations have been completed to evaluate the current system, establish a decision-making process, and survey the available alternatives. During late July, the group conducted a workshop to establish system evaluation criteria and to make decisions as to which vendor supplied components warranted further investigation. These investigations will be conducted using a demonstration computer system that will be set up at the Nine Springs Plant. This system will be tested for communications and functions. This will give plant staff an opportunity to use new features of the systems and for this "hands-on evaluation" to feed back into the decision making process for final evaluation and selection. During the testing, CDM will work out the system costs for the available alternatives. In the end, all this information will assist us with selections and implementation.

The results of the evaluations and decision-making are expected to be complete by mid-October. The Facilities Plan document should be finalized by the end of the year. In the coming months, work will begin on writing a Request for Proposal to select a design engineer. The design project is expected to be completed by late 2011. Construction or implementation of the PCS upgrade will begin in early 2012.



A major challenge ahead in this project is rewriting programming. The District and Applied Technologies, Inc. of Milwaukee are designing the 11th Addition to the Nine Springs Plant. Construction for this Addition will be well underway before PCS implementation begins. Both projects will be disrupting the plant at the same time. This will make management of the projects difficult and management of the plant a headache! In the end, with implementation of these improvements, the plant and its processes should be easier to manage and maintain for years to come.

Matt Allen

EAST BLOWER ENGINE REBUILT

At the end of April the gas engine for East Blower 1 was sent to Massillon, Ohio for a factory rebuild. In early September, this engine was returned and is now running. A new ignition system was installed with the project. The engine was completely dismantled and all cylinders bores and the crankshaft alignment were checked against specifications. New pistons, sleeve liners, all gaskets, connecting rods, bearings along with numerous other parts were replaced making the engine like new again.

During the run-in period at the plant we will need to take special care not to damage anything — all new parts must seat and wear into good position. We have already done a valve adjustment and will need to do an oil change after 500 hours of operation. The engine currently has 153,717 hours on it. That's over 17.5 years of continuous operation. We look forward to many more years of service from this engine.

Dan McAdams



Rebuilt East Blower Engine installed in the East Blower Building

Engineering Projects

Badfish Creek Farm Bridge Replacement Project

As part of land agreements made when the Badfish Creek Effluent Diversion Project was constructed in the mid-1950's, the District built four farm bridges across the widened creek. The bridges were located near Highway A, southeast of the Village of Oregon. This was done to enable the farmers to access farm fields on both sides of the creek. As part of the agreements, the District was also responsible for the maintenance of the bridges in perpetuity.

Over the years, the bridges deteriorated. Wooden piers in the water and in the bridge abutments rotted and debris (windfalls, etc.) floating down the creek damaged the piers. Farming practices also changed over the years. New farm equipment became bigger and heavier, exceeding the original design capacity of the bridges.

To address these issues, the District hired MSA Professional Services to evaluate the bridges and recommend a course of action. MSA Professional Services determined that the bridges

should be replaced, and MMSD initiated what became known as the Badfish Creek Farm Bridge Replacement Project.

Design of the project was completed in early 2010. The existing bridges, which were concrete decks supported by wood piles and a steel girder system, were to be replaced with concrete-filled steel piles, concrete abutments and pre-stressed concrete girders that spanned the entire creek. This eliminated the possibility of debris accumulating on and damaging any piles located in the creek.

Bids for the project were accepted on May 6, 2010. The project was awarded to Ruzic Construction Company of Neillsville, WI, based on their low bid of \$540,407. Ruzic began construction in early August, and to date, has completed two of the four bridges. The remaining two bridges are expected to be complete by the end of September. This will allow use of all four bridges for the fall harvest.

Jeff Klawes is the District's Project Engineer for this work.



Badfish Creek Farm Bridge — The Old



Badfish Creek Farm Bridge — The New

Pumping Stations 6 & 8 Rehabilitation

Two years after the project began, the Rehabilitation of Pumping Station Nos. 6 and 8 is nearing completion. This was expected to be a lengthy project, since a significant amount of time is required to procure new pumps for the stations, install them one at a time, and prove their performance through a short period of operations.

Pumping Station 6 modifications included four new 125 horsepower pumps and a building addition to accommodate new electrical and HVAC equipment. Pumping Station 8 included four rebuilt pumps (two from Station 6 and two from Station 8) and a small building addition for new electrical and HVAC equipment. The total cost for the project for both stations is \$5.7 million.

As of September, the project is substantially complete. All new and rebuilt pumps have been installed, new electrical systems are on-line, and new HVAC systems are operational. Remaining work includes some identified punchlist items, final painting and finishes, and landscape restoration. The work is expected to be complete before winter. Eric Hjellen is the District's Project Engineer for this work.

The next MMSD pumping station rehabilitation project will be for Pumping Stations 11 and 12. Design for this work will begin in 2013, with construction scheduled for 2014-2015.

Northeast Interceptor — Pumping Station 10 to Lien Road Relief and Replacement

Construction of the Northeast Interceptor-PS10 to Lien Road Relief/Replacement has continued throughout the summer. As of September, the entire mainline interceptor has been installed. This includes 9,220 feet of 48-inch through 63-inch sewer to relieve or replace the existing 48-inch sewer. It also includes three major tunnels; beneath Highway 30, Highway 51, and a rail crossing at Sycamore Avenue.



Machine boring through PS10 wetwell wall

The remainder of work to be completed in the next month or two includes pavement replacement, landscape restoration, completing junction manholes where the new and old interceptors cross, and completing connections from the old abandoned interceptor to the new interceptor.

One connection that has been completed is where the new relief interceptor discharges into Pumping Station No. 10. This required a 66-inch diameter hole to be drilled through the 16-inch reinforced concrete wall of the wetwell at the station. A wire cutting machine, pictured below, was used to drill the hole through steel and concrete.

The machine uses a diamond-braided wire rope (approximately ¼-inch in diameter), which spins at a high speed in a loop through the center of the hole to the outer radius. As the rope spins, the machine slowly turns around the circumference, completing the core. The entire hole took about 6 hours to complete. When the boring was complete, the new 54-inch interceptor pipe was installed in the hole and the space between the pipe and the hole was sealed tightly.

The work on this project is being done by Morgan Contracting, Inc. Most work on the project should be complete by October 2010. Dick Klaas is MMSD's Project Engineer.

Bruce Borelli

WELLNESS EVENTS AT MMSD

The MMSD Wellness Committee has had a busy 2010. In February, many MMSD employees participated in annual health screenings. While we have had nearly the same number of participants this year as last, the average score for all participants improved by almost two percent over last year!



Due to some fabulous April weather, the MMSD Wellness Committee sponsored a lunchtime poker walk where employees walked to five stations around the plant and collected playing cards. The top three poker hands received a Subway gift card, and all participants came back to a sub potluck. The length of the walk is approximately one mile. This provides time to have a good walk and still enjoy a short lunch. We repeated this walk on May 19th to celebrate National Employee Health and Fitness Day.

In June, we held our annual wellness picnic lunch. Walking tacos with all the fixings and lots of fresh fruit were served. All employees were invited to test their skills at frisbee golf and a bean bag toss after lunch.

In July, the Committee sponsored a sub walk similar to the lunchtime poker walk - with the subs, but without the cards. In August, we brought back the ever-popular Bike/Walk/Blade/

Skate/Float.

Planned fall wellness events include a healthy recipe potluck contest in September, flu shots in October, and bowling in November. Some proposed ideas for next year have included a bike to work day and a lunch event to raise awareness of the community supported agriculture benefit that our health insurance provides.



Kris Huehne

MISCELLANEOUS PROJECTS

Aeration Tank Inspections

Aeration Tanks One through Nine, were taken down and inspected during June. The tanks were cleaned and settled grit removed with the assistance of Honey Wagon and District staff. The aeration diffusers were acid washed, rinsed, and o-rings replaced as needed. The crew cleaning the tanks averaged 31 hours per tank. The tanks were returned to service and the project was completed near the end of June. Aeration Tank 24 was also inspected by AJ/Sanataire for the condition of the PVC piping, o-rings, and the diffuser stones. Piping and diffusers in this tank were replaced 25 years ago by Sanitaire. The testing showed that while the piping is in good condition and doesn't merit replacement, the o-rings, diffusers, and possibly the diffuser rings will need replacement soon. A project is underway to determine the best replacement design for the diffusers, which will be replaced over the next four years.

Digester Gas Leak Repairs

Valuable methane gas has been seeping from two plant anaerobic digesters for some time. Minor repairs to stop the leaks from Digesters One and Two had been marginally successful. The leaking had recently become so bad that it affected plant operations. The District contacted Joe Daniels Construction for repairs. Joe Lynch coordinated the work with Joe Daniels Construction. This rehabilitation work resulted in replacement containment structures being poured outside the present structures, and new covers installed. The contractor also repaired leaks around all the digester mixers. The Buildings and Grounds crew made gaskets, coated the structures, and installed the new covers. The resulting increase in gas captured has been very substantial. Steve Reusser has found that the energy value of our gas, as an annual average, is about \$.005 per cubic foot. The gas saved in doing this work may be close to 20,000 to 30,000 cubic feet per day. At these rates, we would save over \$100 per day for each of the digesters. Over the course of a year, this savings would amount to more than \$80,000. Digester No. 2 was completed first, followed by digester No. 1.

Plugging the Leaking Roof

The climate in the east stairwell of the District's Operations Building recently has become more stable. Prior to replacement of the stairwell upper windows with a solid roof, the climate was very weather dependent. One may have experienced sunshine and warmth or the climate of the rain forest, with rain in the stairwell. The original design and construction of the "skylight" windows had failed and rain was pouring through the joints and falling through the stairwell.

The window removal and roof installation began on August 9th, and the project was completed near the end of August. Our part of the project included removal of the old windows, installation of the rafters, sheathing, addition of ice and water shield, insulation, drywall, sheet metal work, and painting. All this work was completed by members of the Buildings and Grounds crew. Capital City Sheet Metal installed the standing seam roof and an EPDM membrane roof to complete the outer portion of the project. Thanks to the efforts of all involved, the stairwell project turned out great and is very much appreciated.

Brad Walker



For Lynn and Edie Szudy, retirement training starts now!



Gerry Sachs and family

Retirements

LYNN SZUDY & GERRY SACHS RETIRE

Lynn Szudy retired from the Information Services group of MMSD on July 9, 2010. Lynn joined the District during April 1995. In 1995 and beyond, Lynn's network and database skills were a welcome addition to our experience. In 1995, a new Novell network had been established. MMSD did not have any internet access, and many of the old database structures were well aged and needed replacement. These upgrades occurred over the years Lynn has worked here.

Lynn grew up in Mazomanie, where some of his mother's family had lived since before the Civil War. He lived on the family farm during second grade and went to a one-room country school that year. After the first semester of high school, the family moved to West Allis, where his father had become principal of Central High School. He attended and graduated from Nathan Hale High School. It didn't seem like a good idea to go to the same high school that his father worked at. During senior year, among the myriad of tests at that time he took tests for the service academies, and was surprised to receive an appointment to West Point. This was the year when, in reaction to Soviet achievements like

Sputnik, the academic load was increased 20%. The most memorable event was probably marching in President Kennedy's inaugural parade.

Leaving West Point after a couple of years, he enrolled at Ripon College (where his parents had gone to school). The West Point curriculum did not map very well to that of any ordinary college, but by a stroke of luck, the Dean of Man at Ripon had been an instructor at West Point, and all of the credits were transferred. This made it possible to complete college in a total of three years. Lynn met his wife, Edie, at Ripon, and they both went to summer school in Mexico City (in order to complete the few credits still needed).

During that summer, Lynn was accepted in both the Anthropology and Psychology programs at the University of Chicago. After earning a Master's in Anthropology, and halfway to a PhD, he looked for a job and became an instructor at Lakehead University in Thunder Bay, Ontario. The next year, they moved to Toronto to work for the Ontario Institute for Studies in Education. After a few years, a deep recession caused the loss of grant money and Americans were first to be cut. After a fairly short period of working in city

planning for the Province of Ontario, and the birth of their first son, they moved back to Wisconsin and the family farm, with the plan of going to medical school. Some roadblocks then included being considered "out-of-state" and therefore subject to higher tuition. As so often happens, the eventual result was to simply look for jobs to support a family. During this time, Lynn worked for a number of companies in the Madison area.

During the 1970s, Lynn began teaching himself about computers. He built an early computer and expanded this same machine over time. He owned several others computers later, and eventually, began working in the computer field. This led him to work for Warzyn Engineering and Corning Inc. Lynn's increasing computer experience led him to work at MMSD.

Lynn and Edie have three grown boys: Robin, Jamie, and Andy. Lynn and Edie find themselves incredibly busy these days, caring for their four grandchildren. Lynn never thought he'd be so busy in his retirement.

We wish Lynn, Edie and their family all the best in Lynn's retirement.

Gerry Sachs retired from MMSD June 8, 2010. He started working at the District in 1970, also on June 8th. Gerry was first hired to work for MMSD as part of the field survey crew for the Northeast Interceptor. Following this work, Gerry moved to the District's former First Street office to assist Wayne Johnson with engineering work. During the mid to late 70s, while working full-time, Gerry completed college at the University of Wisconsin. His degree was in Industrial Engineering, but he had focused much of his study in Sanitary Engineering. Gerry graduated in 1977.

Gerry spent the later part of his 40 years with MMSD reviewing and detailing sewer plans and extensions. During the time he was involved with this work the environment changed from strictly paperwork to all digital work. During the past two years, his work relied heavily on

databases, computer-aided design work, and geographic information systems. In between snacks, Gerry was always working to improve the processes he used to perform his work.

Prior to starting work with MMSD, Gerry graduated from Oregon High School. He attended Texas A&M for two and a half years studying Industrial Engineering. During this time out-of-state tuition was taking a toll on his pocketbook. Gerry chose to reduce this pressure by joining the Army - of course, that choice had its own set of pressures. Gerry served in Vietnam for one year during his three year military service. Following his military duty, he returned to Madison and was working for C & C Construction when he was hired for District work.

Gerry's family has had a long history of association with MMSD. The house of his grandfather's former farm is located on

District property. Gerry's father, Edward, also worked for MMSD as a mechanic and welder from July 1950 through December 1975. Gerry's mother is doing very well at 92.

Gerry has four children and with his wife Sherry, enjoyed a recent reunion with all the children and 11 grandchildren. Gerry has been spending some time lately setting up some workshop space in his garage. He's had extra time to visit garage sales and pick up items for this workshop. The big question that we all have though, is how can he get any time in his workshop between snacking sessions?

Gerry, your work and humor will be missed! Best wishes to you and your family for the future.

Matt Allen



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Derek Steinhorst began work with Monitoring Services/Sewer Maintenance crew on June 22, 2010. Derek will assist with collecting samples and data for the User Charge system and will also help the Sewer Maintenance crew keep 95 miles of interceptor lines and 44 miles of forcemain maintained in the MMSD collection system.

Derek has worked for two summer seasons on the District's Building and Grounds crew. Derek is a 2008 graduate of Oregon High School and the MATC construction and remodeling course.

Derek, who lives near Oregon, also enjoys hunting, golfing, and coaching youth hockey.

We welcome Derek!



Derek Steinhorst

Harry Denson was employed at MMSD from September 18, 1978 through June 15, 2009. He spent many of his year working with the Buildings & Grounds crew. He is missed by all.



**Denson, Harry
Richard "Rick"**

MADISON - Harry Richard "Rick" Denson, age 53, of Madison, passed away on Tuesday, May 18, 2010, at the HospiceCare Center, after a long battle with head and neck cancer.

He was born on May 24, 1956, in Madison, the son of Harry J. and Helga (Holmburg) Denson. Harry graduated from Oregon High School, attended Madison Area Technical College and received a

degree in electronics. He worked for the Madison Municipal Sewage Department for 31 years. Harry enjoyed working around the house and tinkering in the garage.

He is survived by his sisters, Marlene (Ed) Webb of Oregon, and Sharon (Bud) Hertzner of Almogordo, N.M.; nieces, Lois (Norm Adkins) Schmitz of Oregon, and Sheila (Jim) Delgado of Almogordo, N.M.; great-niece, Amanda Chestnut of Madison; great-nephew, Bradley Schmitz of Madison; great-great-niece, Ava Chestnut of Madison; and several cousins.

Harry was preceded in death by his parents.

Funeral services will be held at GUNDERSON OREGON FUNERAL HOME, 431 Soden Drive, Oregon, at noon on Friday, May 21, 2010. Visitation will be held at the funeral home from 10 a.m. until the time of the service. Memorials may be made to HospiceCare Inc.

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