Maine WasteWater NEWS

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What One Municipality Has Accomplished: The City of Saco and Its Energy Committee

By Travis Peaslee
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Saving money and helping the environment are two goals the city of Saco has always set as a high priority. To help address America's oil dependency, rapid climate change, and rising energy cost, the city knew it had to take a stand and do its part in tackling these issues. In the fall of 2005, the city formed an energy committee to investigate means for conservation, energy efficiency, and renewable energy. The committee consists of a city councilor, a staff person from the Ferry Beach Ecology School, the maintenance director for the Saco schools, and city personnel, and meets on a monthly basis to discuss and handle energy- related problems. The committee is non-appointed and has an open door policy to all interested parties who are sincere and passionate about making a difference.

Initially, with limited knowledge on the subject, the committee turned to the experts, who graciously attended various committee meetings. Speakers from organizations such as the Maine Office of Energy Independence, Department of Environmental Protection, and Efficiency Maine supplied the committee members with the knowledge and know-how to make a significant difference in Saco.

The committee initially spent a substantial amount of time and effort to research and evaluate ways to save energy. Wanting to ensure that technologies and methods were proven, the committee toured facilities that had already established energy-efficient systems. The tours covered specific areas of interest that were being considered by the committee and included wind turbines in Hull, Massachusetts; geothermal heat systems at a middle school in Gorham and at the Maine Audubon Society in Falmouth; and a photovoltaic/wind turbine hybrid system at the Maple Hill Farm Bed and Breakfast located in Hallowell.

Along with seeing technology first hand, the committee had representatives from local businesses attend meetings to present their expertise in their respective fields. The committee gathered many good insights and derived many energy projects from these meetings. The committee believes that the most productive way to approach these projects is to listen to the experts, decide what projects can be implemented, and then to just do them.

Relying on the plethora of information that the committee members had gathered, the Saco City Coun-

Cont'd on page 2

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*For a complete Board Listing, please visit the MWWCA website at: www.mwwca.org

Upcoming Board Meeting Dates:

September 17-18 – Fall Convention – Sunday River

October 7-8 – MMA Convention
Augusta Civic Center

October 23 – Monthly Meeting
Bangor Treatment Facility

cil appropriated $300,000 to invest in city-wide energy improvements. Addressing the least efficient items, or as the committee refers to them "low-hanging fruit," Saco implemented a proposal from Sebago Energy to replace city-wide departmental light bulbs with compact fluorescent lights (CFLs). This project alone is saving the city more than $11,000 annually, with a four-year payback period. Another quick fix was the replacement of 16 of the city's 22 departmental refrigerators with more efficient ones, providing a total savings of $2,200 annually with a three-year payback period. Several other small-scale projects made a huge difference:

- The replacement of all departmental computer cathode ray tubes (CRTs) with new flat screens, which consume 90 percent less energy.
- Purchasing an electric car along with a hybrid Toyota Prius for city personnel use.
- Programmable power strips for computer peripherals.
- Various improvements to replace inefficient doors and windows.
- Upgrading the heating system at the city community center.

The city's largest energy consumer, its wastewater treatment plant, has also implemented the use of renewable energy technology. The facility has installed a 33-foot 1.8-kilowatt wind turbine to help supplement power at its administration building. Along with capturing wind, the facility is using the sun in a newly installed solar thermal heating system to completely heat a newly constructed building. A new process control building, still in its conceptual phase, is expected to extract heat from the wastewater to completely heat and cool the building. The treatment plant staff has also been proactive at energy efficiency; they have undertaken projects such as installing natural-light solar tubes and solar-powered outdoor lighting, using variable frequency drives on all motors, and only purchasing premium efficiency pumps.

Though no city energy policies are developed from the committee's initiatives, it is becoming an unwritten rule that new city buildings will be as green and as efficient as possible. A great example of this is the new transportation center, which upon completion will be the centerpiece for the city's energy accomplishments. The facility will be a 6,200-square-foot building that will be heated and cooled from a closed looped geothermal system. The energy for the building will be supplied by a 100-foot 50-kilowatt wind turbine projected to produce at least 90,000 kilowatt hours annually, enough to completely power the facility. The transportation center energy projects are key milestones; they speak to the high effort, dedication, and devotion of the energy committee.

Prior to the approval of funding for the energy committee, several large-scale efficiency projects took place in Saco, thanks to federal grants and Efficiency Maine's incentive program. All traffic lights within the city were switched to LED (light-emitting diode) lights, which are much more efficient than traditional incandescent bulbs and require minimal maintenance. The Saco school department also replaced most of the lights in its schools with CFLs and implemented a building automation system that allows for controllable heating, cooling, and lighting to ensure maximum conservation. To date, the schools have reduced electrical consumption by nearly 20 percent. These projects have made a considerable difference in energy con-sumption and have served as the inspiration to do more.

The city of Saco, as well as the energy committee, has taken this matter seriously and is dedicated to continually addressing energy issues. Several members have attended courses to better understand the subject and to educate as many people as possible. The city Web site has posted articles to inform Saco citizens of the committee's actions and accomplishments to promote energy efficiency. Along with the substantial steps toward complete energy efficiency, the city has teamed up with the Ferry Beach Ecology School to create public awareness through Earth Day activities. The city has joined the Governor's Carbon Challenge, signed the U.S. Conference of Mayors Climate Protection Agreement and was recently named the "Greenest City" in Maine by Going Green Magazine.

Saco is part of a statewide grass-roots

Cont'd on page 3

U.S. Conference of Mayors Climate Protection Agreement

On February 16, 2005, the Kyoto Protocol, the international agreement to address climate disruption, became law for the 141 countries that have ratified it to date. On the same day, Seattle Mayor Greg Nickels launched the U.S. Conference of Mayors Climate Protection Agreement to advance the goals of the Kyoto Protocol through leadership and action by at least 141 American cities. By the June, 2005, U.S. Conference of Mayors Annual Meeting, 141 mayors had signed the Agreement. On November 21, 2008, the Conference of Mayors announced that more than 900 mayors have signed the Agreement to date.

Under the agreement, participating cities commit to take the following actions:

- Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns.
- Urge their state governments, and the federal government, to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the U.S. in the Kyoto Protocol, a seven percent reduction from 1990 levels by 2012.
- Urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emissions-trading system.

Source: http://www.usmayors.org/climateprotection/agreement.htm and http://usmayors.org/climateprotection/documents/climateagreement112108.pdf [Accessed December 14, 2008]

Saco Upgrades

The Saco wastewater treatment facility has completed two separate upgrades to significantly enhance the treatment process and its equipment. The upgrades took place at the same time, however, were being completed by two separate entities.

The storm water upgrade was designed by DeLucca-Hoffman Engineering of South Portland, Maine and was being completed by T Buck construction located in Auburn, Maine .The storm water upgrade included installation of a new 24" influent line from Wharf Street that will allow more flow into the facility. Upon entering the facility, the flow will enter a newly constructed diversion structure that was built to allow only the design maximum flow of 8.4 MGD to enter the full treatment process. All excess flow will discharge over a designed wall in the diversion structure that sends the excess flow into a cyclone swirl tank called the storm king, capable of treating an additional 5.6 MGD. The grit from the influent waste water, along with that collected in, and pumped out of, the storm king will then enter the recently constructed grit swirl tank. Using the same centrifugal force technology as the storm king, the grit will be dewatered and removed.

This undertaking will allow the facility to better treat its design flow while giving all excess flow primary treatment and disinfection. Included in this upgrade was the addition of a new grit handling building and the removal of two offline 50' clarifiers that were no longer being utilized.

The second upgrade, which is primarily process equipment related, was designed by Woodard & Curran of Portland, Maine and was completed by plant personnel. The upgrade incorporates a multitude of new equipment and changes that will help the facility better remove nutrients, allow more efficient air supply, make pumping more effecient, better control odors, and increase automation, thus decreasing the physical demands on the work force. The upgrade includes two new blowers, diffusers, and anoxic zones (zones where no free dissolved oxygen is present) for the aeration system, a rotary sludge thickener, an improved odor control system, many new pumps and piping, a drive unit for the primary clarifier and many other pieces of equipment that will further enhance the treatment process.

Both upgrades were completed at the end of 2006. The facility personnel are ecstatic over the upgrades and the improvements they brought. The final result of the projects will deliver a significant step towards full automation, improved odor control, maximum equipment efficiency, enhanced waste water and storm water treatment, and complete combined sewer overflow (CSO) elimination. Along with the upgrades, the facility implemented alternative energy sources in an effort to become energy self sufficient. Solar thermal panels were added to the newly constructed grit handling building; a 1.8 kW wind turbine was erected to supply power to the administration building, as well a many small scale energy efficiecy projects. A plan is in place to install a geothermal heat pump and utilize the wastewater to heat a new process control building that will be constructed in the near future.

The facility, as well as the City of Saco have accepted Governor Baldacci's "Carbon Challenge" and are hoping to fully eliminate all sources of hazardous air pollutants. Though near completion of the upgrades, the facility is continually dedicating its efforts to make the wastewater facility as environmentally friendly as possible.

SACO & ENERGY cont'd

effort to address these very serious issues, and it is currently working with the Maine Chapter of the Sierra Club, the Maine Council of Churches, and energy committees in SAD 71, Biddeford, Eliot, York, Bath, and Falmouth.

The next steps for the energy committee include the following:

- To explore using micro hydro turbines at the wastewater treatment plant.
- To expand the city's wind turbine program.
- To use biodiesel in municipal diesel-fueled vehicles.
- To consider the use of geothermal heating systems on more city-owned buildings.
- To investigate feasibility of using LED outdoor lighting on street lights.
- To continue with projects to reduce the use of energy.

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Sanford Sewerage District's Laboratory Certification

By André Brousseau, Chief Operator


Thomas Magno

The Sanford Sewerage District recently completed a two phase twenty million dollar upgrade that was required by one of the most stringent discharge permits in the State of Maine. The facility effluent must meet extremely low nutrients limits for total phosphorus and ammonia nitrogen year round. The District has been performing all the required sampling and testing in its own laboratory. Monitoring frequencies contained in the MEPDES permit require three days of sampling per week during the months of May through September and one day per week for the remainder of the year. During a recent inspection by Maine DEP, the inspector informed us that DEP would be enforcing the Maine Comprehensive and Limited Environmental Laboratory Certification Rules which require any laboratory testing for phosphorus and ammonia for compliance reporting to be certified by the Maine Department of Human Services(DHS). Now we were faced with finding which was more cost effective: to become a fully certified laboratory or send the samples out to a commercial certified laboratory.

The minimum number of samples required for an entire year is 176. This number does not include any extra Q.C. procedures that might be required by certification and would have to be performed by the lab technician. After review of commercial lab pricing, we understood that we were facing more than $7,000 per year of additional outside laboratory expenses. We also realized that with three days of sampling per week during the summer months, the commercial labs may not get results to us as quickly as we needed and we would not be aware of any non-compliance issues during the time interval between analysis and receipt of the results. The District had already spent $6,800 on a spectrophotometer and glassware to perform the nutrient testing and other process control tests required by this state of the art facility. After reviewing costs, we determined that $5,300 per year would be needed for in house testing.

The next step required us to contact Maine DHS for an application and to obtain a copy of the rules that our laboratory would have to meet. That was followed by an on site evaluation by a certification officer from Maine DHS. With a few tweaks of our already existing SOP's, adjustments to the lab quality control and assurance manual, and two days of extremely helpful training by Clearwater Labs, we were notified in December 2008 that all the needed documentation had been received and reviewed. The District's laboratory was now certified by Maine DHS to perform the analyses of Ammonia nitrogen and total phosphorus required by the new MEPDES permit. The success of Sanford's certification effort was due to the District's laboratory technician, Thomas Magno, and his tremendous effort to achieve this certification. In the end, the work led to increased capability and savings to the District that made it all very worthwhile.

Maine "Management Candidate School"

By LeeAnn Hanson

JETCC, the Maine Wastewater Control Association, and Maine DEP are pleased to announce a new training program aimed at mid-level operators with the potential to rise into wastewater facility management. The program is called Management Candidate School (MCS) because it will provide the intensive training, networking and skill-development coursework necessary to prepare students to become the next generation of wastewater managers and leaders. With many of Maine's current wastewater managers at or near retirement age, it is hoped that the individuals who complete the MCS program will be available to continue the critical work of managing the state's wastewater treatment infrastructure.

JETCC's Board of Directors and the Maine Wastewater Control Association Executive Committee led the effort to create this new training program, with the MWWCA and ME DEP providing significant financial support. In addition, MWWCA members, New England Interstate Water Pollution Control Commission (NEIWPCC) professionals, and Maine Department of Environmental Protection employees will be serving as trainers and staff support for the effort. The year-long program will include management courses, technical courses (such as engineering basics and process control) as well as skill training in areas such as personnel management, media relations, dealing with regulatory agencies, and budget preparation. Participants will earn more than 60 training contact hours.

The MCS program starts on Thursday, October 15, 2009 and will be held at the University College in Saco. Interested operators should submit their application by September 4, 2009.

Original notice for this training was sent in a letter from Maine DEP and MWWCA to facility Superintendents and Managers. More information and application forms are available by request through JETCC. For more information, call JETCC at 207-253-8020.

Pearls of Wisdom About Maine Lakes

People have many questions about lakes in Maine:

◊ "Is the water in Dedham's Green Lake very green?" (No)

◊ "How does water clarity in Farmington's Clearwater Lake compare to Poland's Mud Pond?" (Clearwater Lake is about twice as clear as Mud Pond)

◊ "What has been happening to water transparency in 'my' lake over the past 30 years?" (It depends on the lake)

◊ "At what elevations are chain pickerel found in Maine?" (Less than 1,000 ft.)

Questions about Maine lakes can be answered by consulting information found at the PEARL Web site (www.pearl.maine.edu). For over a decade, PEARL (Public Educational Access to Resources on Lakes) has provided lakes data to the general public, students, researchers and resource managers across North America and beyond (a recent inquiry about crayfish data came from the Czech Republic).

PEARL is managed from the Senator George J. Mitchell Center for Environmental and Watershed Research at the University of Maine in Orono. Annual updates to the lake water quality data are collected by Department of Environmental Protection lakes biologists, and an 'army' of enthusiastic and very capable volunteers affiliated with the Volunteer Lake Monitoring Program (www.mainevolunteerlakemonitors.org).

In PEARL, you can browse through the list of data tables in the system by category: water quality, fauna, flora, etc. Alternatively, you can focus on a particular lake and see what information is available for that waterbody. Once at a lake's page, there are several "visualization" and reporting tools available to you. For example, you can request a chart that displays the annual trend in lake water clarity called the Secchi depth. Other options include a summary table of water quality data, lists of fish and mussel species present in the lake, and whether the lake hosts any invasive aquatic plant species. Note that these reporting tools are "dynamic" – the charts and summary tables reflect the most recent version of the data in the system.

Other sections of PEARL contain information summaries compiled a few years ago as part of Maine's Aquatic Biodiversity Project. There are species distribution maps for fish, amphibians & reptiles, crayfish, mussels, dragonflies & damselflies, and several other invertebrate groups, including chironomids and mayflies.

Over the past several years, PEARL has evolved and grown considerably to better serve the needs of its users. It is now 'on the move' again. A new "Lakes of Maine" web site will be released later this year. It will provide even more convenient access to a greater library of information about Maine lakes – data, documents, information summaries, and data visualizations. The new site will use both Google Earth and an even easier to use version of Google Maps – one that is based on a mapping system recently developed for biodiversity data at Acadia National Park. With this new website, PEARL will be even more useful in answering your questions about the lakes of Maine.

This column was submitted by Peter Vaux, an Associate Research Professor with the Senator George J. Mitchell Center for Environmental and Watershed Research at the University of Maine, Orono, ME. E-mail your PEARL questions to peter.vaux@maine.edu or send them to In Our Back Yard, Maine DEP, 17 State House Station, Augusta, ME 04333.

This is your newletter --if you have news you would like to pass along or an opinion to express that would be of interest to the membership of MWWCA we are always interested in receiving material and will make every effort to incorporate your submissions.

UPCOMING EVENTS:

****MWWCA Golf Tournament****
September 16, 2009
Sunday River

****MWWCA Fall Convention****
September 17-18, 2009
Sunday River

****WEFTEC****
October 10-14, 2009
Orlando, Florida

Maine WasteWater NEWS

AUGUST 2009 ISSUE

please circulate and share with your colleagues

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