

# Maritime Provinces Water & Wastewater REPORT

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## NOTE FROM THE CHAIR

**Andrew Garnett**  
MPWWA Chairperson

April 25-28, 2010 will mark three decades of operator support. This will be celebrated in Saint John at the 30th annual Maritime Provinces Water and Waste Water Associations conference. It was 30 years ago when a group of water and wastewater treatment plant operators gathered to exchange information and share thoughts from others in their field. Today, although the number of people has grown, the basic purpose still lives on. Meeting and exchanging information with other colleagues is so valuable.

As the Association moves forward so must its members and our executive. I encourage everybody to become active in the Association by sharing your thoughts and ideas to make us more successful than we already are.

At this time I'd like to thank the executive of the MPWWA for all their hard work over this past year. Leo: looking after the finances of the MPWWA is not an easy task and your effort does not go unnoticed. Todd and Clara: the hours you put forth make this Association stronger. Rob: thank you for organizing what will be a great conference. Also, the zone, commercial, and government reps; thanks for all your contributions. We surely make a great team.

A common theme in my chairperson's notes is education. Take advantage of the workshops that are being offered. We have ventured with some great people who take pride in presenting and preparing these educational sessions. CEU's on a certificate mean more than just a number as they have in the past. CEU's are a vital piece of keeping your certification.

I send best wishes to the members of the MPWWA and hope you have a great 2010!

*Andrew Garnett*  
Chairperson of the MPWWA



There are 12 dewatering beds working at Canadian Forces Base Gagetown. See the story on page 8. (Photo: Sgt. Carl Elson)

## Federal effluent regulations drafted

Stakeholders and the general public can comment on proposed municipal wastewater systems effluent regulations that were published in the Canada Gazette last month.

Environment Minister Jim Prentice introduced the draft regulations Feb. 9. Once in force, they will set standards for the discharge from the more than 4,000 wastewater facilities in Canada.

The regulations under the Fisheries Act will allow the government to implement its Canada-wide Strategy for the Management of Municipal Wastewater Effluent that was endorsed by the Canadian Council of Ministers of the Environment in February 2009.

Agreements covering the roles and responsibilities for reporting, compliance, inspection and enforcement activities will be negotiated between federal,

provincial and territorial governments.

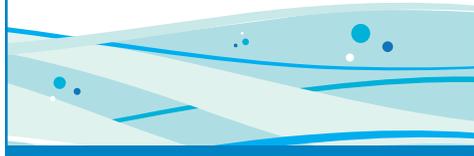
The total cost of implementing the Strategy over 30 years is estimated to be between \$10 billion to \$13 billion.

To access and comment on the draft of the proposed regulations, contact Environment Canada's public inquiry centre at 1-800-668-6767, 819-997-2800 or [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca).

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ADDRESS LABEL HERE





# Halifax Water applies for two rate hikes

Halifax Water has applied for two rate increases to repair and replace the city's aging wastewater systems.

On March 25 it applied to the Nova Scotia Utility and Review Board (NSURB) for a new rate that would cost homeowners 31¢/day to begin in October and a 25¢/day rate effective April 1, 2011.

Halifax Water General Manager Carl Yates told reporters that the city should invest \$1 billion over the next 25 years to replace its old wastewater and storm water systems.

He pointed out that a number of the sewer

pipes in Halifax were over 100 years old and deteriorating, and that its manholes were subsiding.

Yates agreed it would be expensive but warned that the price for doing nothing would be much higher: the collapse of sewers, roads and buildings.

He also pointed out that the city will soon have to meet federal regulations for the Canada-wide Strategy for the Management of Municipal Wastewater Effluent.

If Halifax Water's request is approved the NSURB will hold a hearing in June and make its final decision in September.

# Upgrades to water system to be discussed at upcoming meeting

BY STAFF

## THE NEW GLASGOW DAILY NEWS

[Pictou, NS]—Pictou (Nova Scotia) town officials will be holding a special meeting at a future date to discuss plans for upgrades to the town's water systems.

Scott Conrod, chief administrative officer, gave an overview of the current plans at a committee of council meeting on Monday (Feb. 1).

Right now, the town is looking at clustering nine of the 13 planned wells into a single transmission line, which then can be serviced by a single treatment facility.

Halifax-based business CBCL Consulting Engi-

neers are expecting to have the new line's design complete by the end of March, as well as a pre-design report for a new central treatment plant for the drinking water system.

The town is also considering water meters for residential customers.

All of the issues will be discussed at an upcoming special meeting of council. The date for that meeting has not yet been set.

The water upgrade is the town's attempt to treat a red water problem that has been plaguing residents for the past few years. While there's no problem with the quality of the water, the discoloration is causing issues.

# Charlottetown to introduce metered water this summer

BY DAVE STEWART

## THE GUARDIAN

The City of Charlottetown (Prince Edward Island) is moving to a user-pay system this summer for all new customers who hook up to the city's water supply.

The water and sewer utility introduced a notice of motion at Monday night's February council meeting (Feb. 8) to amend the current bylaw. The first reading of the amendment will follow at the next council meeting on March 8.

When the bylaw amendments are finalized, water meters will be installed on all new connections and existing residential customers will be given the option to become metered. Existing customers who want to become metered can do so at no cost. Customers on metered water pay for the amount of water they use rather than the existing flat rate.

"The only cost to them would be whatever plumbing change is required to install the meter," said Craig Walker, manager of the water and sewer utility, noting that the cost is not normally expensive.

Since 1995 when amalgamation came in, all new homes connected to the city's water system have what's called an idler, a

small makeup-like piece of copper that was installed to the entrance of the home. The water meter is something as simple as pulling the idler out and putting the meter in.

"Some of the older homes might be a little more involved but we've actually gone through some programs to see what kinds of costs they can expect, anywhere from \$50 to \$75 would likely be the cost."

Walker said they won't be pushing residents to convert to meters.

"We might try and promote the reason why they may want to shift to it. Quite frankly, if you can control what your monthly charges are, certainly that's a positive thing for any homeowner. You can control it because you're now paying for just what you use."

Walker expects it will take a couple of months to get the bylaw amended and approved. If everything goes according to plan, water meters could be available by June. As for demand, he anticipates getting up to 60 calls a year from customers looking to switch to metered water.

Based on research in other jurisdictions, Walker said people on metered water normally drop their consumption, on average, by about 15 to 20 per cent.

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## MPWWA PROFILE: Rob Hamilton

Every issue, the MPWWR shines a spotlight on an MPWWA member making a difference in the industry. Rob Hamilton is the focus of our April issue.

# The Gift of Patience

BY STEPHEN CLARE

"I don't know how they do it." Rob Hamilton is on the phone from New Brunswick. I ask him to clarify.

"Leafs fans," replies the 50 year-old chemical technologist for the City of Saint John. "I don't know how they settle for putting that kind of crap on the ice year after year. They must be the most patient hockey fans in the world."

Hamilton speaks with authority. Patience is something that the married father of one is more than familiar with.

After graduating from New Brunswick Community College in 1983, the Winnipeg-born water sample analyst was hired by Saint John Water. Over the next 25 years, Hamilton obtained his Level 3 wastewater treatment plant operator certificate, his Level 2 water treatment plant operator certificate and his Level 1 water distribution operator certificate.

"I'm proud of what I've accomplished in my professional life," he says. "But I'm more proud of what I've done in my personal life."

Hamilton is referring to his relationship with his 14 year-old son Matthew, who lives with Autism Spectrum Disorder. "Mattie is a normal kid in most every way, except that he doesn't communicate or learn as effectively as others his age."

"It hasn't been easy at times," he confides, "but I am always amazed and inspired by his courage and determination and, perhaps even more so, with my own patience."

That patience has served him particularly well when dealing with public ignorance and prejudice

of the condition. "We've come a long way in educating people about ASD, but there is still a lot of work left to be done."

When he isn't busy being dad or on the job at one of Saint John's nine water and wastewater treatment plants, Hamilton can be found at the bowling alley. "I am a member of a provincial candlepin team. Our big deal every year is a trip Bangor, Maine where we participate in the Canadian-American tournament."

During the summer months, he keeps fit on the baseball diamond. "It's a slo-pitch league," he continues with a chuckle, "which is a fitting name for it, because I pitch awfully slowly."

That camaraderie with his peers offers a safe haven from the pressures of everyday life. "I have known most of these boys a long time. We have a little local bar that we go to regularly just to get away from it all and share a few laughs and "wobbly pops."

This past February, the gang took off for a weekend road trip to Montreal. "Six guys in a van for nine hours – you do the math," he laughs heartily. "Actually we went up to see the Canadiens play a couple of afternoon games against the Penguins and the Bruins."

The life-long Habs fan is as knowledgeable about the team as he is passionate. "I'm not sure which direction they are going this year," he notes. "But I'm patient — their players are young and talented and appear to have a good future ahead of them."

"And," he adds with a smile, "at least they're not the Leafs."



Rob Hamilton

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## Despite funding denial, ACAP hoping to proceed with sewage study

■ BY STAFF

### THE WESTERN STAR

The city's (Corner Brook, Newfoundland & Labrador) decision not to help fund an economic benefit study on sewage treatment is "short-sighted," according to the local environmental organization looking to do it.

At Monday (Feb. 8) evening's public meeting, the request for \$20,000 towards the study was unanimously turned down by council.

The study, as proposed by ACAP Humber Arm, would examine the total costs of sewage treatment versus the total benefits of improved water quality within the Humber Arm.

Sheldon Peddle, the local organization's executive director, said similar studies have been undertaken by other municipalities within Atlantic Canada — each showing the cost "far eclipsed" by the economic benefit, demonstrating a high return on the investment rather than an expense.

In a prepared statement, Peddle dismissed comments from members of council and staff that such a study isn't required.

"For once, especially on the issue of sewage treatment, it would be nice for our municipal leaders to actually lead, to look beyond doing the bare minimum that is required of them," he said.

He also said the study would be a valuable tool in assisting lobbying efforts to better the funding arrangement with other governments.

With new federal regulations expected to come into effect later this year requiring all communities to have a secondary level of sewage treatment, Peddle said such a study is more crucial now than ever. He said there will be a big competition for what he called small pots of funding.

"How do we stand out amongst the crowd to ensure we get our funding?" he asked. "We present our case, not just in environmental terms, but also economic. We demonstrate to these funding agencies that, in providing funding to the City of Corner Brook, they are not just remedying an environmental catastrophe, but also helping grow the regional economy."

In its request to the city, Peddle said ACAP suggested funding come from the sewage levy fund, which according to the city's 2010 budget, has accumulated \$1.85 million with an additional \$587,500 predicted to be added in 2010.

ACAP had already secured partial funding from other sources, and Peddle said the organization plans to still complete this study.



The water and wastewater systems in Fredericton, New Brunswick will receive \$1.4 million in upgrades through a federal-provincial-city project. The announcement was made earlier this year by (from left): Minister of State for Atlantic Canada Opportunities Agency Keith Ashfield, Fredericton Deputy Mayor Bruce Grandy, and NB Environment Minister Rick Miles. (Photo: Communications New Brunswick)

## Water infrastructure upgrades

The water and wastewater systems in Fredericton, New Brunswick will receive \$1.4 million in upgrades this year.

The federal government is contributing \$470,601 under its Infrastructure Stimulus Fund, and the province and the city will match that contribution.

The upgrade project will see one drinking-water distribution main replaced to reduce the potential for watermain breaks and improve flow in the area. The project will also enhance wastewater maintenance by reducing the piping from two sanitary mains to one. Three outdated hydrants will also be replaced.

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# Fixing a hole...

■ BY STAFF

In early November 2009, a \$1 million sinkhole developed on North Foord Street in Stellarton, Nova Scotia.

Town engineer Tony Addis originally thought a mineshaft collapsing underground had caused it.

But as weeks passed and flooding continued near the Exit 24 off-ramp, he determined it was a cracked concrete box culvert.

The culvert was installed in 1963 to address water drainage from the highway. According to the New Glasgow Daily News, it was linked to an existing storm water sewer system—"the tunnels"—that were constructed around 1914. The 1.5-metre high culverts handled a third of the town's storm water carrying it to the East River.

Addis explained to Town Council that at some point in time, a 15-centimetre wide crack developed in the top of the box culvert, at the junction where it joined the tunnel system. That allowed dirt to trickle into the tunnel system and when water entered the culverts, the dirt was washed into the tunnels.

"The ground must have settled over time—and we don't know how much time or when it cracked," Addis said in the New Glasgow Daily News. "But all this was happening 60 feet below the ground, underneath the lights by the Sobeys's office. When

we did know there was something going on, we had this hole and a main sewer line had broken. All of that flowed through the void, into the cracked tunnel."

As time passed the tunnel system was totally blocked and very little water could get through the culverts. But when the flooding began and it was believed that a mineshaft had collapsed, firefighters hosed down the sinkhole. And water poured out of the culvert close to the Exit 24 off-ramp.

Once workers with mining gear went into the tunnel they discovered the real cause of the problem and repairs began. Two pumps ran constantly to prevent the flooding from reoccurring.

Addis estimated that fixing the culvert would be around \$700,000; pushing the price tag on the sinkhole to \$1 million.

The engineer told the newspaper the initial step would be to clean out the 180-metre long tunnel. "That's the easy part. Then comes repairing the broken section of box culvert, and any other damages done to the tunnel system because of the clogging."

That will have to be done underground because "it would be too deep a hole and too active a spot to dig ... from above," Addis explained.

The next-to-last step will be to stabilize the ground around the sinkhole.

The final step will be to pay the repair bill. And that's another story.



The \$1 million sinkhole in Stellarton, Nova Scotia. (Photo: The New Glasgow Daily News)

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# Water crisis hits home

■ BY YVETTE D'ENTREMONT  
THE WEEKLY NEWS

[Beaver Bank, NS]—Residents dealing with severe water shortages in Beaver Bank's Monarch-Rivendale (Nova Scotia) subdivision have voted overwhelmingly in favour of footing the bill to bring municipal water to their neighbourhood.

The problem centres around a significant lack of water. A community survey was distributed in November to gauge the level of support for moving forward to bring municipal water services to the area. Based on the number of votes that came back last month, more than 80 per cent supported the move.

The quoted cost per resident, per lot, was initially about \$20,000. That "guesstimate" has since gone down to about \$17,500, with the local councillor working to further reduce that number.

"When you're talking about the kind of money we're talking about here, I wouldn't have expected such an overwhelming 'yes' vote," said Waverley-Fall

River-Beaver Bank Coun. Barry Dalrymple.

As of two weeks ago (Jan. 1), 160 ballots were marked in favour of moving forward compared to 32 against. Dalrymple said he finds it "disgusting" that municipal, provincial and federal governments have refused to help fund such a project.

"I know of one residence that has two-900 foot wells that have both been hydrofractured and had numerous pumps replaced and they still have less than a quarter gallon of water per minute," Dalrymple said. "They can't have more than one shower a day, and can't hook up a clothes washer or dishwasher. There are others facing similar scenarios."

Many affected residents have told Dalrymple they had no water issues two or three years ago, but now find themselves regularly going dry.

"Some are trucking in water every two to three weeks. We're not talking about these folks wanting city water, they are in desperate need of city water," he said.

Pam Clarke is one such resident. She has watched her family's dream home turn into their nightmare.



Pam Clarke has watched her family's dream home in Beaver Bank's Monarch-Rivendale subdivision turn into their nightmare over a lack of sufficient water to do basic things like laundry, have a shower or even flush a toilet. (Photo: Halifax News Net)

## Editor's Note:

On March 2, Halifax Regional Council voted unanimously in favour of a city water solution for Monarch Rivendale at a Public Hearing at Regional Council. The residents of Monarch Rivendale will be receiving city water.

HRM and Halifax Water Commission staff is expected to issue tenders for construction of the project by the middle of April. Construction could begin this fall.

The busy mother of four said when they first moved in two years ago, they used as much water as they needed to care for and clean up after their large family.

Last March (2009), they ran out of water for the first time. Assuming it was due to over consumption, they cut back and began closely monitoring their usage. The water began disappearing two or three times per month. Now, the family must truck water

in every nine or 10 days, costing them about \$500 every month and a half.

They're only using about 60 gallons per day, which doesn't go far when you have a house full of sick kids and no water in your house to wash vomit from bedding in the middle of the night. She described the heat of summer and the smell wafting from the bathroom through the house as "pretty bad."

*Continued on page 7*

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# Sewage problem fix will cost Souris \$80,000-\$100,000

■ BY NANCY WILLIS  
THE GUARDIAN

[Souris, PEI]—It will cost between \$80,000 and \$100,000 for the town to fix a problem that sees raw sewage spill into the harbour here (Souris, Prince Edward Island) any time the power goes out for an extended period of time.

The town was directed by the Department of Environment to fix the problem immediately. The unsavory predicament is caused by one of the town's main lift stations which stops pumping sewage from sewer lines to the main treatment plant when there is no electricity avail-

able to operate it. During severe storms overflow can take place within an hour.

In the short term, the engineering firm of ADI has proposed installing a generator at the lift station, which would kick in as soon as the electricity is off for more than several minutes.

Town administrator Shelly Lavie said ultimately the town wants to have back-up power at both the lift station and the treatment plant.

"But our immediate need is to get a generator at the lift station," Lavie said. "We had to do the same thing a couple of years ago at the lower lift station on Colville Bay when overflow was happening there. Now we want to do same thing

at the upper station to protect the harbour."

Mayor David MacDonald said council will approach the provincial and federal governments for help. The cost of the single generator installation will run between the \$80,000 and \$100,000 price tag quoted.

"As of now there is not the standard infrastructure money," he said. "We will have to decide whether we go for the temporary fix or the whole job."

Lavie said the town has not approached either government yet, because, until it received the ADI proposal this week (March 12), it did not know exactly what it needed...

# Deficiencies rectified

On March 5, the Halifax Wastewater Treatment Facility (WWTF) temporarily stopped receiving flows so deficiencies, identified prior to the WWTF malfunction on Jan. 14, 2009, could be rectified.

D&D WaterSolutions Inc. installed a baffle system in the wet well to allow for a more even distribution of wastewater flows to the raw water pumps.

The contractor also installed an auto-lube system for the main/coarse screen that will allow for a more constant lubrication of the screen mechanism and provide better operation and prolonged operational life for the system.

D&D WaterSolutions Inc. converted the coarse screen screw auger conveyor to a belt conveyor. This will allow for more efficient, reliable handling of coarse screened material.

The week's work was undertaken at the contractor's cost. While the Halifax WWTF was shutdown, all flows were diverted from it and discharged through the Combined Sewer Overflow chambers along the waterfront.

The modifications will not delay the full restoration of the Halifax WWTF, scheduled for completion this spring.

# Water crisis hits home

Continued from page 6

"To put it in perspective, with six people each flushing just four times per day, that's 24 flushes using about two gallons per flush and washing hands," Clarke said. "You've already used 48 gallons, and that's not doing any laundry, dishes, or showering."

Clarke said she can see five houses from her own front door, and none of them have water.

"Most people are envious when they see my house, but it's worth nothing. If you don't have water, you

have nothing," she said.

Brad Conrad, president of the Monarch-Rivendale Community Association, was very pleased with the recent survey results. He has dealt with "on again, off again" water for five years, with his woes starting just seven days after he moved in.

An expert who checked his well told him the water table was disappearing at an alarming rate.

"I knew I had to get enough support to pursue this as a group, not just by myself," Conrad said. "It took

time for people to admit to it because they were worried about the value of their homes and were embarrassed to talk about having no water."

If water doesn't come to his subdivision soon, Conrad predicts a mass exodus.

"People will start selling their homes in droves and people will just abandon their homes. It sounds drastic, but people can't live in them and can't survive without water," he said. "I know people who use snow to flush their toilets. They're living in \$400,000 homes."

HRM staff and Halifax Water officials are currently preparing a report for Halifax Regional Council.

If the report is brought to council for first reading

by Jan. 19 or 26 as Dalrymple hopes, a public hearing date would likely be set for mid-February with the idea of pushing ahead to have the project go to tender this spring.

"They want it as fast as possible," Dalrymple said.

Residents are encouraged to regularly visit the Monarch-Rivendale Community Association's web site at [www.monarchrivendale.com](http://www.monarchrivendale.com) for updates and to view all correspondence and information relating to the water issue.

"I will never look at water the same way again. I don't think my children will either," Clarke said. "My five-year-old daughter has said 'Mom, all I want is a bubble bath.'"



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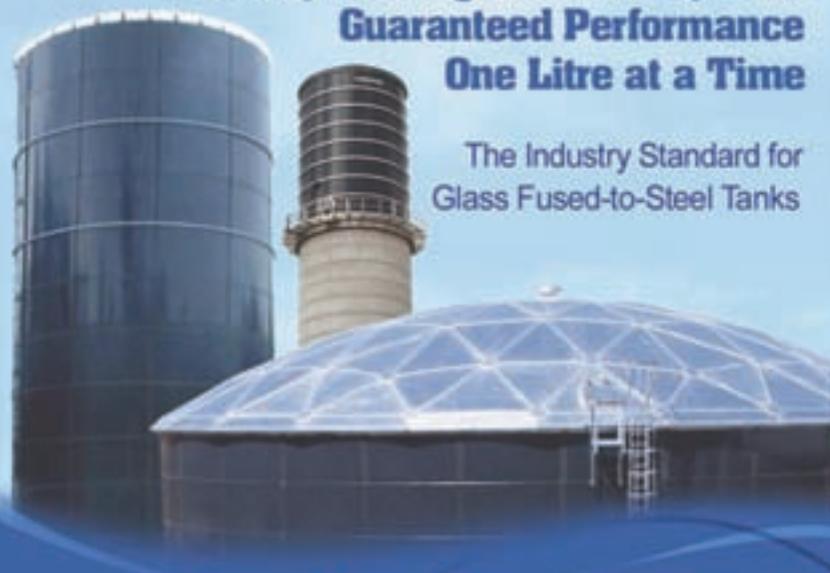
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# Dewatering bags in use at CFB Gagetown

■ BY HEATHER JONES

There are 12 dewatering beds working at Canadian Forces Base Gagetown, where approximately 10,000 meters cube of sludge is produced annually before digestion.

"It's fantastic technology," said Warrant Officer Paris Keeping, the Acting Utilities Officer who manages the conventional sewage treatment plant at the New Brunswick base.

Made from durable geotextile filtration fabric, the dewatering bags retain solids and allow the water to seep through its pores and return to the head of the plant for treatment.

"The bags are 45 feet in diameter and 100 feet long with three evenly-spaced ports," Keeping said. "Approximately 9 conventional beds of sludge is processed in one 45"x100" bag at about 700 meters cube."

He explained in the past the base has had problems with sludge management, hiring a contractor to pump out the digester. "Now we have enough storage space in the dewatering bags we can carry out digester operations through out the winter months."

The Land Force Atlantic Area Environmental Officer, Sheldon Downe, discovered the dewatering bags and suggested they be tested.

3 ASG Environment Officer Tom McLaughlan said, "Paris' crew quickly jumped on it knowing they could make use of this particular technology."

Geotubes® from Scotia Tech in Nova Scotia were used when the year-long test began in 2008. "And they are an excellent product," Keeping stated.

Spinpro, a British Columbia company, manufactured the dewatering bags presently on the base.

When the test began the bags arrived on a pallet and were rolled out onto empty drying beds. Keeping said it only takes two people to roll them out and fit them into place.

McLaughlan added that because "the existing beds were built in 1954, the bags are made to the size of the beds. It's an old system—all effluent went back to the plant and we'd treat it again."

Keeping explained the sludge is pumped from the valve gallery in the digester building. "We hook up to the camlock fitting connection on the end of a butterfly valve, pump (the sludge) through 4" hoses directly into dewatering bags. It's all tied into the polymer injection equipment."

"The operators mix the polymer in 1000-L mixing barrels and set an injection pump to the required amount for optimum performance," McLaughlan said. "The quantity is based on the requirements of the sludge."

"The polymer is Drew Flocc 444. It's the best we've found to do the job," Keeping noted. "We take samples every 5 to 10 minutes to determine how well it's going to settle."

"The polymer creates a coagulated bond, the solids are pumped into a dewatering bag allowing the water to seep out."

McLaughlan was surprised by the clarity of the water coming from the bags. "It's almost clear. It's amazing to see it come out. If operator's polymer mix is right on target I think the Mg/L would be approximately 20 or less."

The 3 ASG Environment Officer said, "It's 6 per

cent solid in the digester. When it's (the bag) ready to be removed, the moisture content is reduced to 10-15% and almost all of the sludge has settled out."

"It takes a couple of weeks to fill a bag," Keeping said. "We need two people to do the process for three to five hours a day, two to four days a week. The time varies depending on the sludge in the digester."

He said overall the dewatering system was "a little more expensive" than the conventional system used in the past because one person has to remain on the site.

But it eliminates potential aluminum phosphorous problems with the soil and other environmental concerns.

When filled the dewatering bags reach 6' in diameter. McLaughlan said each bag is so durable "once it has started to fill a number of men can walk (safely) on top of it."

When full the bags sit through a one-year freeze/dry period. Then they are removed by a pay-loader, put in a dump truck and sent to an environmental recycling facility where the material is reprocessed.

Keeping noted, "The moisture content of sludge inside depends on the size of the bag. It's a powder on the outside and a jelly on the interior. The heat can't get inside."

New Brunswick's climate is also a factor.

"The rain runs off the bags," McLaughlan said. "Its pores have a one-way flow."

Keeping pointed out that the weather affects the dewatering bags "in a good way" as the freeze/dry process helps the waste material consolidate. "But

we don't use them in the winter because it's too cold."

There may be a solution to that quandary. The Warrant Officer explained that a municipality in the northern part of the province has built a greenhouse around its dewatering bags and uses them year round.

He plans to investigate a portable greenhouse that would provide solar heat as it was moved up and down the beds.

## ADDITIONAL TESTS

A company was hired and further dewatering bag tests are being considered at the base's water treatment plant (WTP) and its outdoor tank wash.

McLaughlan said the WTP is 60-years-old and its processing technology is to release the backwater into the environment.

He noted that it had to be operational all year round and the challenges were to reduce the total suspended solids (TSS) and find an acceptable polymer—"The polymer Paris' crew uses at the sewage treatment plant wouldn't take out the sediment."

The 3 ASG received a design with three options. "There's one really good option but dollars and cents are involved here. The long-term viability of the treatment plant has to be taken into consideration along with other extenuating circumstances. Certainly there has to be consideration given to the year round operation of this system and the challenges that it presents. A greenhouse option is certainly viable."

*Continued on page 9*



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Continued from page 8

McLaughlan said that the company took a number of samples of the effluent from the WTP to their laboratory. The effluent was collected over a 24-hour period in 5-gallon pails. At the lab it was put through a small dewatering process and tested with various polymers.

The company used the same testing process with samples they took at the outdoor tank wash.

He explained that the Gagetown training area has heavy clay content. The Leopard tanks, LAV's and other military vehicles wind up coated in a tremendous amount of mud and silt during training. "This presents a huge challenge reducing the clay content in the effluent from the wash bays, and substantially increases the retention time before the outwash can be released to the environment. The heavy clay content will not settle out."

The lab results are back but to date no decisions have been made.

*Warrant Officer Paris Keeping has been Acting Utilities Officer at CFB Gagetown for two years. He is responsible for the looking after the WWTP, the WTP the Central heating plant, the outdoor tank wash and the fuel tank program.*

*Tom McLaughlan is the 3-ASG Environment Officer who is responsible for the garrisons, armories and other areas in New Brunswick and Prince Edward Island. He is the Manager of CFB Gagetown's environmental management systems and oversees the management plans for all environmental issues the base faces.*



One of the dewatering beds at Canadian Forces Base Gagetown. (Photo: Sgt. Carl Elson)

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# Piping away storm water must change as water tables drop, meeting hears

■ BY NIGEL ARMSTRONG  
THE GUARDIAN

Strange, perhaps silly, that with so much concern about sinking water tables, government officials insist on spending millions of dollars collecting water in pipes to carry it off to oblivion, a meeting in Stratford (Prince Edward Island) heard Monday (March 15).

That was one of many surprising observations to come out of a meeting on climate change hosted by the town of Stratford.

It is one of four communities in Atlantic Canada where federal funds are helping create and test guidelines and models for urban planners across Canada in the face of climate change, whatever its cause may be.

Members of the public gathered around maps and tables to brainstorm issues and circle locations of concern in Stratford, both now and in the future.

Dropping water tables, deeper wells and saltwater infiltration of those wells was a re-occurring theme.

Phil Wood, an urban planner consultant on PEI, was at the meeting as an interested member of the public.

"There is a tradition of putting storm water in pipes and making it go away," said Wood.

That tradition needs to change for areas where water tables are dropping, he said.

Storm pipes take rainwater out to sea where it is rendered useless from a groundwater perspective.

Such storm piping systems cost millions, even billions of dollars, costing even more than drinking water and sewage systems.

"We are losing the resource (of fresh water) every time we put in a pipe, at horrendous costs," said Wood.

Wastewater used to run in ditches that might lead

to holding ponds, known as detention areas. That posed problems for children who would sometimes get swept away or trapped while playing during storm events, acknowledges Wood.

More and bigger storm events are predicted with global warming, the meeting was told.

"The reality is you can design detention areas so they are very shallow and large and flat and they dry up in a matter of hours," Wood said.

"They don't have to be high risk if they are designed properly. You don't make them small and deep, you make them large and flat.

"There are all kinds of examples across North America."

There are communities taking out stormwater piping systems and replacing them with safely engineered ditches known as swales, plus detention ponds which keep water in the community, he said.

That retained water seeps back into the ground and helps re-supply the community's water table.

Wood told the meeting he was a consultant for a PEI developer who wanted stormwater detention ponds and swales in a proposed subdivision, but that was shot down by the provincial government. Engineers said the ponds would attract mosquitoes.

Mosquitoes should not trump groundwater replenishment, said Wood.

"There can be marginal concerns but most of them are overblown," he said. "You can design detention pods to put sand in the bottom. They drain in a matter of hours or days.

"There are all kinds of ways to mitigate the problems. I think if people understood the impact of what they were doing by filling in ditches, they might think twice."

The ripping out of storm pipes and using water retention techniques is called "daylighting" in urban

planning circles.

"There is a general consensus within the planning profession (for that change)," said Wood. "I am not sure that consensus is in the engineering profession. I

don't see too many signs of it and that is unfortunate."

Wood is a geographer by training but says community planners come from a wide variety of backgrounds, not just engineering.

## Biggs Drive plant to get retrofit

■ BY RAISSA TETANISH  
THE AMHERST DAILY NEWS

[Upper Nappan, NS]—The wastewater treatment facility servicing those on Biggs Drive (Upper Nappan, Nova Scotia) is getting a retrofit.

The Municipality of Cumberland County approved a motion at a council meeting Wednesday (Jan. 20) to accept a \$45,500 design proposal from ABL Environmental.

Robert Streach, director of public works for the county, said the oversight committee is confident the proposal meets all the requirements and comes well under the \$61,000 budget for the project.

"The consultant has recommended the construction of an SBR, and that the existing tankage at the existing treatment plant be utilized to a great degree in the retrofit," Streach said.

Streach told councilors that SBR stands for sequencing batch reactor, which is the same technology used at the treatment plant in Pugwash.

"One of the benefits of going with this technology is the staff's knowledge and previous experience with the same technology," he added.

The motion also included a \$3,971 contingency plan, from the same consultant, for the upgraded facility.

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# Project will see about two kilometres of new sewer line in Westville

■ BY STAFF

## THE NEW GLASGOW DAILY NEWS

(Westville, Nova Scotia) Town council got a glimpse of a \$1.1 million trunk sewer project Monday night (Jan. 25), one that will see approximately two kilometres of new sanitary sewer line go into the ground this year.

New Glasgow's town engineer, Bob Funke, told council in a presentation that the new line can be

considered a new backbone for Westville's 38-year-old system and will pave the way for future enhancements.

Funke said the upgrade is needed to prevent combined sewer overflows and frequent breaks around Union Street due to the age of the infrastructure.

"Since I've been involved with the Westville sewer system, it's been plagued with problems during heavy rainfalls," he said.

Mayor Roger MacKay also stated the need for the upgrade.

"Like Bob had stated, even years ago there were breaks and breaks upon breaks. So hopefully this is going to fix the situation."

The new system will connect South Foord, Drummond Road, across Acadia Park to Water Street, West Street and finally Acadia Avenue. A total of 438 homes will connect to the new line, while an additional 167 will connect to a new force main.

The project, which is contingent on a mix of federal, provincial, municipal and gas tax money, has been tendered to ACL Construction of Antigonish. The municipal portion of the funding is approximately \$190,000, which would be repaid over a 20-year period.

ACL's bid was just over \$971,000. Funke said that the company is prepared to begin in late March, weather permitting. The cost for the project is higher than an initial estimate of \$910,000.

## Unique wastewater treatment system

Regina is considering a unique approach as it prepares to upgrade its 50-year-old wastewater treatment facility.

According to the Journal of Commerce, the Saskatchewan capital could replace its wastewater lagoons with a 4000-acre plantation containing 24 million willow trees. It says two to four million litres of effluent can be treated by an acre of willows.

The wastewater would travel by pipe or canal to the plantation and be surface irrigated by pumps ensuring equal distribution.

Biomass from the willow trees would be ready to harvest three or four years after they were planted.

A second part of the project in Regina would involve the construction of a biomass energy plants powered by wastewater and the plantation.

The concept comes from Rural Generation Ltd., a small company in Londonderry, Northern Ireland that plants and harvests short rotation willows using them as a biofilter for effluent and as a bioremediator for sewage sludge.

Rural Generation Ltd. has planted over 1000 hectares of willow throughout Ireland and Scotland and uses them as an energy crop and biofilter. It plants and establishes willows, harvests and processes them into dry willow chips.

City officials have a lot of research to complete before the projects are approved. They are investigating willow varieties, the hardiness of the trees (to withstand bitterly cold winters), disease resistance and bio-filtration abilities.

The construction budget for the plant upgrade is estimated at \$120-\$130 million.

## Maine water and wastewater infrastructure projects funded

Maine has been able to take advantage of two federal water and wastewater infrastructure projects this year.

In February, Agriculture Secretary Tom Vilsack announced \$128.1 million in funding for 47 projects designed to improve water quality and public sanitation services in 19 states.

Maine's Madison Water District received a \$450,000 loan and a \$1,121,500 grant for water system improvements.

On March 18, Vilsack announced funding for 60 water system projects in 20 states that totaled \$159 million.

The town of Norway, Maine will receive a \$385,000 loan and a \$1.1 million grant for wastewater system alterations that will improve sewer system efficiency, protect public health and safeguard groundwater quality.

The project will replace ageing clay pipes, service lines and manholes. The new system will reduce the wastewater discharge from the Norway treatment

facility into the Little Androscoggin River.

The Mars Hill Utility District will receive a \$70,000 loan and an \$180,000 grant for wastewater system improvements, and a \$750,000 grant to improve its water system.

The Boothbay Harbor Sewer District will receive a \$342,000 loan and a \$250,000 grant to improve its wastewater system.

To date, the US Department of Agriculture (USDA) has announced \$2.3 billion in Recovery Act funds for water and environmental projects since President Obama signed it into law in February 2009.

The funding is being administered by USDA Rural Development's Water and Environmental Program, which provides loans and grants to ensure that the necessary investments are made in water and wastewater infrastructure to deliver safe drinking water and protect the environment in rural areas.

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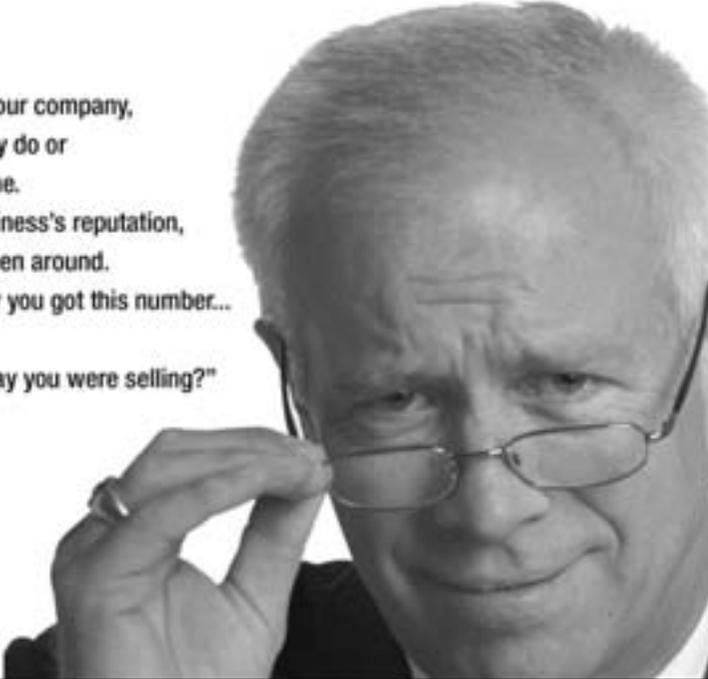
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# Future direction of CSI sewer project hinges on survey

■ BY KATHY JOHNSON

The future direction of the Cape Sable Island (CSI) sewer project hinges on the results of a door-to-door sanitary sewer survey of island citizens living within the southwestern Nova Scotia municipality of Barrington.

The voluntary survey will produce an anonymous, summarized report that pinpoints problem wastewater areas on CSI. The report will also propose appropriate sewer solutions based on the information received.

After investing a decade of time and effort along with thousands of dollars for studies and engineering fees, the municipal unit was ready to pull the plug on the project in early February, after being faced with one hurdle after another in trying to bring the project to fruition.

The state of the local economy, an increased debt load on municipal taxpayers, marginal majority support from the community and the fact that "...no sanitary sewer survey has ever been completed to determine the location, extent or concentration of any sewer services problems on Cape Sable Island, making it impossible to determine the appropriate solution to an undefined problem..." were cited as reasons to terminate the project in a committee recommendation to council, that was subsequently deferred until after the survey is completed.

More than \$6.4 million in funding for Phase I of the sewer project was approved last year through the Build Canada Fund. The project has been at a standstill however because suitable property can't be found for a sewage treatment plant, even though some 20 properties have been considered.

Phase I as it stands, is to build a sewage treatment

plant to service the island communities of North East Point, Stoney Island and Clam Point. The plan calls for grinder pump systems to be installed at each home, which would be hooked into a sewer line, as opposed to a conventional sewer system, where pumping stations move waste along the line.

Given the difficulty of finding a sewage treatment plant site, the municipality has also explored the option of connecting the eastern side of the island to the Barrington sewer system but that idea was voted down.

News that the project may be cancelled drew public reaction that raised a multitude of questions and concerns about the project.

"My position is proper planning has not been carried out," said island resident Wanda Atkinson. "I'm suggesting better planning is needed. I'm suggesting council not proceed until there's a well thought out plan in place." She pointed out that although it is widely acknowledged there is a wastewater problem on the island, the problem has "never been defined."

Questions were also raised if the grinder system is the best option for the project, given the electrical requirements and number of older homes that may need to be upgraded in order to hook into the system.

With four years to complete the project, municipal council was urged to take the time to do a study to define the problem rather than just throw in the towel.

"This has been on-going for 10 years and still there's not a clear picture for council to go on," said councillor Cecil O'Donnell. "The most important question that needs answered is what do the residents need? Does anybody know for sure if there's 5, 10, 50 or 100 homes in district five that have on-site septic systems not working properly? I think this whole issue has been a little bit here and a little bit there without a plan



Vehicles travel the Cape Sable Island Causeway, home to more than 3,000 residents in southwestern Nova Scotia. While the island town of Clark's Harbour with a population of under 1,000 people has a public sewer system, efforts by the Municipality of Barrington to provide the same service to the remainder of the island have been hampered. (Photo: Kathy Johnson)

in place."

There's been a "huge sense of confusion around the table" when dealing with the CSI sewer project, said deputy warden Donna LeBlanc-Messenger—a sentiment expressed by several other councillors.

"As I listen around the table there are other options to explore," said councillor Shaun Hatfield. He suggested the municipality "continue in good faith to explore all the options for wastewater treatment on Cape Sable Island."



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# First Nations water and wastewater infrastructure projects

■ BY HEATHER JONES

Three federal water and wastewater infrastructure projects are under construction in First Nation communities in the Atlantic region.

## SHESHATSHIU

Last September the ground was broken for Phase I of two-phase project for the 804-hectare Sheshatshiu Innu First Nation community located 40 kilometers from Happy Valley-Goose Bay, Labrador where effluent is being discharged through an outfall pipe into a river.

The original plan was for a new mechanical wastewater treatment facility to serve the 1,151 community members.

But Rosemary Glynn-Conrad explained that, "once the consultant was engaged and studies and sampling completed a decision was made to go with an aerated lagoon. They have the land base and a lagoon is less expensive over the life cycle of the facility and easier to maintain."

The A/Director, Community Infrastructure and Environment with the Department of Indian Affairs and Northern Development said the design for the 4-cell aerated lagoon is complete. Two of the cells will be 80 x 55 metres and the others 110 m x 70.

Tenders are out for the material.

Phase 1 of the \$7,800,000 project was completed last fall, collection lines were installed and hooked up.

Tenders for Phase II should be issued in late April or May and the project completed in January.

## WAGMATCOOK

First Nations Construction Inc. has almost completed Phase I of a \$4,900,000 two-phase project in the Wagmatcook community in Cape Breton, Nova Scotia.

The changes were necessary to accommodate the growing population that is expected to double by 2025.

They've upgraded 80 per cent of the aerated lagoon that services the south half of the 319.7-hectare reserve.

Glynn-Conrad said Phase II of the original feasibility study outlined different options with one of the recommendations being to construct an extended actuated sludge system that would replace the stabilization pond on the north side.

Instead a Rotating Biological Contactor mechanical sewage treatment plant was chosen. The design is currently underway.

The A/Director said tenders are expected to be issued in mid-April or May.

## NATUASHISH

Construction on an \$8,800,000 project to provide



On March 26, First Nations Construction Inc. had completed approximately 80 per cent of the work on the aerated lagoon in Wagmatcook First Nation in Cape Breton, Nova Scotia. A major component of the phase is the construction of a concrete wall to completely enclose and contain the collected sewage for treatment prior to entering the receiving waters. If weather conditions cooperate, the company expects Phase I of the federal water and wastewater infrastructure project to be finished by May 1. (Photo courtesy of Indian and Northern Affairs Canada)

a permanent water source for the 675 residents of the Mushuau Innu First Nation community of Natuashish, is 54 per cent complete.

The project involves the design and construction of a water intake piping system to supply water from Sango Brook (a nearby river) to a pumping station.

Glynn-Conrad explained that high levels of different chemicals, with the main being the salinity, were an issue with wells on the 4,265-hectare community located 80 kilometers southeast of Nain in Labrador.

She pointed out, "The wells were originally only put in place to serve a short period of time."

The A/Director said a water intake piping system was designed a year ago and that Pennecon Construction had completed over half the work involved. "They finished in November and will start up again in May."



This picture taken at the Mushuau Innu First Nation community of Natuashish, Labrador shows Phase I (left) and Phase II (right) of the four-phase steel pile shoring excavation to extend twin water intake pipes from the existing pumphouse to Sango Brook seen in the background. (Photo courtesy of Indian and Northern Affairs Canada)

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# Coating submersible pumps with energy

■ BY OSMAY OHARRIZ

TECHNICAL SUPERVISOR, BELZONA

Submersible or vertical turbine pumps are an example of centrifugal axial pumps, and they are heavily used for providing various services such as raw water intake, pumping station, cooling water, commercial/industrial and municipal distribution, and mining among others (1,5). The efficiency of such pumps is best represented by the wire-to-water efficiency, which combines the overall efficiency of the pump and the motor. Despite the fact that all the parts of a pump (impeller and casing primarily) are designed to deliver the head and capacity required by the system in the most effective way, several aspects can affect the efficiency of a pump. These aspects are hydraulic, mechanical, and volumetric losses in the pump (6).

Volumetric loss is due to any leakage of fluid through the pump components. These losses increase as internal clearance are opened up due to wear, cavitation, impingement, or entrainment. Mechanical loss is related to mechanical components, which generate reduction in the power transferred from the motor to the pump. Hydraulic loss is caused by the frictional forces created between the fluid and the walls of the hydraulic passage, acceleration and hindrance of the fluid, and the change of the fluid flow direction (3). The smoother the walls of the pump, the less flow fluctuations, and the less energy required for the pump to move the fluid through the hydraulic passage.

Wire-to-water efficiency ( $E_w$ ) can be easily determined by the following equation (3):

$$E_w = \frac{0.043QP}{SG \cdot INP}$$

Where,

$E_w$  = Wire-to-water efficiency (%)

$Q$  = Flow rate (gpm)

$INP$  = Electrical power input (kW)

$P$  = Pressure (psia)

$SG$  = Fluid specific gravity

## EFFICIENCY IMPROVING COATING

These coatings are specifically designed for improving the efficiency of fluid handling systems, and protecting metals from the effects of erosion-corrosion. Their unique combination of properties such as hydrophobicity, self-leveling, and hydraulic smoothness makes these coatings ideal candidates for linings the hydraulic passages of pumps.

Due to the presence of a blend of different amines as part of their composition, these coatings possess a low electronic affinity towards water molecules and result in a smooth glossy finish once applied onto a surface. This fact makes water or any other aqueous polar solutions glide over the coating surface (6). Efficiency improving coatings self-level once applied onto a surface, which increases the hydraulic smoothness and slipperiness of such a pump passage. In some cases, they can be enriched with a small percentage of Teflon®, which contributes to reducing the frictional forces between the surface and the fluid in motion.

## TEST PREPARATION

A test was carried out to demonstrate that an improvement in pump efficiency at rated output

could be achieved when coating various parts of a submersible pump with efficiency improving coatings. The pump tested was a single-impeller multi-stage vertical pump, provided by a reputable pump manufacturer. The pump could handle up to 9,000 gpm, with heads up to 500 ft and bowl size of 20". The submersible pump parts to be coated with the efficiency improving coating were the walls of the discharge head, the enclosing tube, the bowl, the suction bell, and the impeller. The baseline data was collected in November 2006. Previously, the pump had been mechanically restored according to Original Equipment Manufacturer (OME) specifications.

All the application work was carried out by an authorized coating applicator. All the surfaces to be coated were grit blasted using an angular abra-

sive to NACE No.2 (Near White Metal), ensuring a minimum 3 mil (75 µm) angular profile. They were consequently washed with a recommended cleaner degreaser to remove residual blasting debris and contaminants. Masking tape was placed at the outer edges of the areas to be coated to give a neat and clean finish. An efficiency improving coating was applied in two coats using stiff short bristled brushes. Each coat was applied at a wet thickness of 10 mil (250 µm) to a maximum wet thickness of 20 mils (500 µm). All the coated surfaces were allowed to cure and the coating was inspected for continuity.

The following picture was taken after the application of the efficiency improving coating to the pathways of a submersible pump. Enclosing tube with efficiency improving coating



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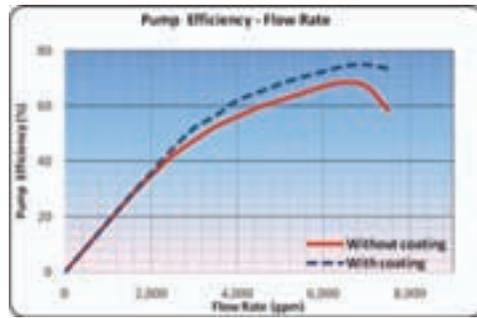
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# and efficiency enhancement coatings



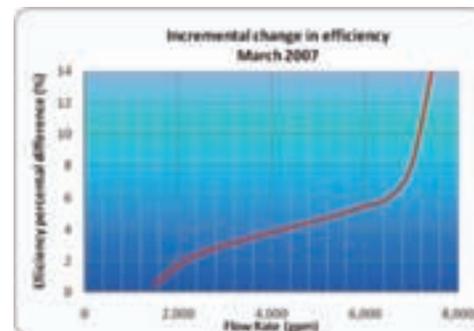
**Figure 1.** Pump efficiency evolution as a function of flow rate as calculated from data collected in November 2006 and March 2007.

As it can be derived from Figure 2, the total energy supplied by the pump to the fluid at the discharge of the pump is greater when the inner walls of such a pump have been coated with an efficiency improving coating. The less friction between the inner walls of the pump and the fluid, the less energy is consumed in overcoming these frictional forces. It is important to note that even though there was a four month period from the time when the baseline data was collected to the time when the coated pump was actually tested, this fact does not mask the results previously discussed. Prior to data collection, the pump was mechanically restored based on OEM specifications. Therefore, the pump was operating at standard conditions when the baseline data was acquired.

As it can be seen, the wire-to-water pump efficiency at BEP was 74.5%, and its corresponding flow rate was

6,500 gpm.

The following graph shows an incremental change in the wire-to-water efficiency as a function of the flow rate. These values were obtained based on a comparison between the wire-to-water efficiency calculated for the baseline (with no efficiency improving coating) and that obtained after coating the pathways of the pump.



**Figure 2.** Pump efficiency incremental change as a function of flow rate as calculated from data collected in March, 2007

As it can be seen in Figure 2, an efficiency improvement over 4% is achieved for flow rate values greater than 4,000 gpm when coating the hydraulic passages of the pump with an efficiency improving coating. For small flow rate values, in this case flow rate under 2,000 gpm, only very slight improvements in efficiency were observed. Over 11% efficiency im-

provement is observed at 8,000 gpm. The duty point of this pump was determined to be 6,100 gpm. In the vicinity of this point, 5% efficiency improvement was achieved.

## CONCLUSIONS

The purpose of this test was successfully fulfilled. The data collected demonstrated that an improvement in pump efficiency at rated output could be achieved when coating the internal surfaces of a pump with an efficiency improving coating. The efficiency improvement was greater than 4% for all flow rates greater than 6,000 gpm when the pump was coated with an efficiency improving coating. In the vicinity of the duty point of the pump, 5% efficiency improvement was achieved. More so, these results obtained after applying efficiency improving coatings on the pathway of submersible pumps, can be easily replicated for other types of pumps as well.

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*(Editor's Note: A version of this article originally appeared in the magazine of power generation)*

## TESTING

The test was conducted in March 2007. The pump was run at a constant input while varying the flow rates, being 400 gpm the incremental rate. The instrumentation used consisted of an outlet analog manometer to log pressure readings at the discharge of the pump, an annubar to record the flow rate, and a watt transmitter to take readings of the electrical power input. Wire-to-water efficiency was calculated using Equation (1). The same procedure was carried out in November 2006 during baseline data collection.

## RESULTS AND DISCUSSION

Figures 1 shows wire-to-water pump efficiency values at various flow rates for two situations: with and without the efficiency improving coating. The graphical representation labeled "Without coating" corresponds to the baseline collected in November 2006. The best efficiency point (BEP) achieved after coating the pump is represented in the graph. The pump duty point is also identified.



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## Sandy Point sewer work to begin

Engineering work has started on a new sewage treatment plant to replace the existing plant in Sandy Point (Nova Scotia).

The current municipal sewage treatment plant which was built in 1969 is located at the north end of the industrial park area. It serves Roseway Hospital, Nova Scotia Community College (Shelburne Campus), the former Boys School and surrounding residential properties, as well as the existing serviced area of the Industrial Park. The Municipality of Shelburne owns and operates the existing treatment plant.

The existing facility which provides primary treatment with a 30,000 USGPD design capacity, is presently over-loaded and often out of compliance with the Nova Scotia Environment effluent discharge limits. The new system will be designed to provide secondary sewage treatment with a design capacity of 50,000 USGPD and will be expandable to 150,000 USGPD to meet future needs from expansion of the Shelburne Industrial Park.

Funding for the sewage treatment plant project has been confirmed through the Building Canada Fund – Communities Component (BCF-CC) and funds previously allocated to the Sandy Point Sewer Extension project from the Municipal Rural Infrastructure Fund (MRIF) have been re-allocated to the Sandy Point Sewage Treatment Plant Upgrade Project. Confirmed federal and provin-

cial government funding for the project now totals \$793,018.

The engineering contract has been awarded to ABL Environmental Limited (Dartmouth) and the scope of work includes pre-design, site evaluation, detailed design and preparation of the technical documentation required to proceed with equipment procurement and construction.

Also included in the engineering work will be a Climate Change Vulnerability Assessment, which will be completed using the recently developed Public Infrastructure Engineering Vulnerability Criteria (PIEVC) developed by Engineers Canada. This assessment will be the first PIEVC protocol implementation study in Nova Scotia and will be funded in part by Natural Resources Canada; \$25,000 for this project component.

The province is also supporting this component of the project. The Nova Scotia Environment Climate Change Directorate will provide \$10,000 in funding for the assessment.

The PIEVC assessment will contribute significantly to the understanding of the potential impacts of climate change on the Sandy Point area, and specifically on the sewage treatment plant.

The assessment will also ensure the new sewage treatment plant is appropriately sited and designed to withstand the impacts of climate change over its lifetime.

## New \$6.6 m sewage treatment plant in the works for Windsor

■ BY CHRISTY MARSTERS

### THE HANTS JOURNAL

The Town of Windsor (Nova Scotia) will flush out millions for a major project that's already begun.

On Jan. 26, Town Council made a conditional approval to award the engineering firm Conestoga-Rovers & Associates project management for the design and construction of a new sewage treatment plant, pending good reference checks; at a contracted fee of about \$173,000.

By the time this project is completed it's been estimated to cost \$6.6 million that will be cost shared by the federal, provincial and municipal governments, which means a total of \$2.2 million is expected to be paid by The Town of Windsor.

Public Works Director Don Beatty noted about half of the town's waste water is now treated, in the newer section of town, by a sewage treatment facility that's located at the end of Centennial Drive.

However, the other half of the town's sewage is basically being thrown into the Avon River estuary untreated, Beatty said. "This new sewage treatment plant will improve the environment ... people do not want to think they're contributing to pol-

lution and this new plant will ensure their sewage is being treated in a responsible manner."

The next step in this project will be for a project manager to look at possible designs, which will help to determine a size and location for the new plant, Beatty added. "All design plans could take 5-6 months to complete ... if we start right away, this project could be completed in March of 2012 roughly."

Mayor Paul Beazley said now untreated wastewater is going into the Avon River, but the days of iffy environment practices are over. "I think it's real important for people to understand this is a project that needs to be done."

This puts a burden on the town but if it is not done now it will become a government mandate to ensure all wastewater is treated before it's sent along, Beazley said, "and we'll have to do it ... right now, having two thirds funded is a key for doing this now."

This is a big project for a town this size, Beazley added. "I can't say what will happen to rates—if tenders are higher we'll have to deal with it—but we'll do the best we can to keep within the budget."

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# Arsenic and old toenails – groundbreaking study launched in Cape Breton

The largest study on arsenic, well water and cancer ever conducted in Nova Scotia is underway in Cape Breton. The study is part of the Atlantic Partnership for Tomorrow's Health, the most extensive cancer study ever undertaken in Atlantic Canada.

The three-year study will examine the cancer risk of low to moderate levels of arsenic in drinking water. The research will help policy-makers in Nova Scotia and across the country decide whether the cancer risk warrants new approaches to water testing and treatment. It will also facilitate the mapping of arsenic levels across the province.

"In many parts of Canada, a large proportion of the population gets its drinking water from untreated water wells. In Nova Scotia, it is particularly high, with 45 per cent of households relying on well water," says Dr. Louise Parker, principal investigator of the arsenic study and the Atlantic Path.

Arsenic occurs naturally in some rock types and can leach into drinking water through drilled or dug wells. Both tasteless and odourless, arsenic at high levels is known to cause cancer—specifically kidney, bladder, lung, and skin cancers—but it is not clear how much arsenic people are consuming or how this is affecting their risk of cancer.

"Arsenic levels of up to 700 micrograms per litre have been reported at some wells in Nova Scotia. Health Canada has set an acceptable upper limit of 10 micrograms per litre of water," notes Dr. Ron MacCormick, Medical Director

of the Cape Breton Cancer Centre.

Health Canada, he notes, recommends that Canadians living in areas such as Cape Breton where there may be high levels of arsenic in the groundwater have their drinking water tested for arsenic contamination.

To complete the study, 5000 volunteers are required. Each volunteer, who must be part of the Atlantic Path study, will provide a water sample that will be tested for arsenic and other heavy metals. Toenail samples will also be collected from participants, aged 35-69, and analyzed for levels of arsenic and other metals such as selenium, which can be toxic in high amounts.

The data will be used to map arsenic exposure across Nova Scotia. Bladder and kidney cancer rates, obtained from the provincial cancer registry, will then be analyzed in relation to the map of arsenic exposure to see if high rates of these cancers are correlated with high levels of arsenic exposure.

The Atlantic Path study is part of the Canadian Partnership for Tomorrow Project, a \$42-million national study funded by the Canadian Partnership Against Cancer. This study will follow the health of 300,000 Canadians between the ages of 35 and 69 for up to 30 years to determine what role lifestyle, the environment and genetics play in the development of cancer.

To find out more about the Atlantic Path and the arsenic sub-study, call 902-494-7284 in Halifax or toll free 1-877-285-7284 or visit [www.atlanticpath.ca](http://www.atlanticpath.ca).



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# Still plenty of water in the well

■ BY HARRY SULLIVAN

## THE TRURO DAILY NEWS

[Truro, NS]—Commercial water use far outstrips that of local domestic consumption in the local water shed but there is still lots of H<sub>2</sub>O to go around, a provincial official says.

"We find throughout the province, all the watersheds still have plenty of room to be developed from a groundwater point of view," said John Drage, a hydrogeologist with the Nova Scotia Department of Environment.

"So it's comforting but we still have to be diligent."

Drage made his comments during a recent (January) presentation to Colchester County Council regarding the local aquifer and groundwater supplies. Council had requested information from the department after some councillors expressed concerns over just how much water was being taken out of the system by the Canadian Springs (Aquaterra Corp.) bottling plant in Valley.

Drage said the company has approval to draw up to 981 cubic metres (981,000 litres) per day from the system while the Big 8 (Sobeys) soft drink company has approval to draw 655 cubic metres (655,000 litres) per day. He added, however, that neither company is utilizing their full water potential.

Overall, the 145 non-domestic wells in the county are currently pulling 13,000 cubic metres

(130,000 litres) daily while the 9,940 domestic wells account for 5,800 cubic metres.

That puts the Salmon River/Debert River watershed among Nova Scotia's top five most developed ground water sources.

"Having said that, it's still less than seven per cent developed, compared to how much water we think is available," Drage said.

And even though the area boasts one of the best bedrock aquifers in the province, problems can occur with individual wells if too many are located too close together.

"We can still have problems at the local scale," he said, "so we still have to keep our eye on the local-scale picture as well as on the big picture."

The province has numerous monitoring wells throughout Nova Scotia, including three in Colchester County, so that a constant watch can be maintained regarding groundwater levels.

But one problem from a municipal planning perspective, when it comes to ensuring too many wells are not placed too closely together, is that there is no communication mechanism in place with the province, when environmental permission is granted for commercial bottling operations such as Canadian Springs or Big 8.

And Drage acknowledged to council, that "there needs to be a better link" between water allocation permits and the municipal land-use planning approval system. As things now stand, environmental decisions are based on current usage, as opposed to a municipality's future land-

use planning goals.

As well, although commercial bottling operations pay an annual fee to the province based on the volume of water extracted, Colchester council believes such companies should also be pay-

ing royalties to the municipality.

To that end, Drage said the issue of royalty fees is included in a water strategy policy that is being developed.

## Water research partnership recognized internationally

The American Water Works Association (AWWA), the largest and oldest international organization of water professionals, has recognized world-class water research that resulted from an innovative partnership between Halifax Water and Dalhousie University.

Alisha Knowles, Ph.D. student in Civil Engineering at Dalhousie has been invited to present her research results on the challenges associated with balancing water treatment objectives to AWWA members, via a syndicated webcast.

Knowles' presentation was selected following her podium presentation at the 2009 AWWA Water Quality Technology Conference in Seattle, Washington.

Knowles was the first PhD student to start her program under the Halifax Water Industrial Research Chair program at Dalhousie sponsored by the Natural Sciences and Engineering Research Council (NSERC) of Canada.

"This has been an exciting partnership between Dalhousie University and Halifax

Water over the last three years," says Research Chair Dr. Graham Gagnon. "It's an excellent example of the international level of research being conducted in our own backyard."

The research partnership, along with Halifax Water's Water Quality Master Plan, provides the basis for stable, continuous investment and innovation in the water system that ensures Halifax Water's customers will always be provided with high quality water.

Halifax Water's Annual Customer Survey, conducted in November/December 2009 by a highly respected, local research firm, helped confirm Halifax Water is on the right track. It received outstanding results from customers in two critical categories. Results indicate 90 per cent of customers perceive water quality as good or excellent, the highest level ever achieved in the annual survey.

In a sub-category on Water Safety surveyed under drinking water, 97 per cent of customers rating Halifax's water as safe or very safe.

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# Water issues under control

■ BY ELIZABETH MACDONALD  
THE CHARTER

Residents of Placentia (Newfoundland & Labrador) who are worried about higher than approved levels of haloacetic acids (HAAs) and trihalomethanes (THMs) in the town's water supply have a new place to visit to explore a wide range of water resources data.

The Department of Conservation and Environment launched a web portal at <http://maps.gov.nl.ca/water/> the same day, March 24, it released a report called "Drinking Water Safety in Newfoundland and Labrador" containing data and developments from April 1, 2008 to March 31, 2009.

According to the report, in that period, 211 boil water advisories were in place, affecting 145 communities and 48,787 people, down from the 229 boil orders the year before.

Environment Minister Charlene Johnson said she is aware some towns are not chlorinating their water because people don't like the taste of chlorine and there is little government can do about it.

The water report, themed "Rural Reactions and Remedies," also indicates large numbers of people were drinking water containing higher than recommended levels of chemicals that form when chlorine interacts with leaves and vegetation, HAAs and THMs.

The document says 144 serviced areas that provide water to 161,249 people had levels of HAA above national drinking water standards.

A total of 128 serviced areas providing water to 131,064 people had greater than suggested levels of THMs.

There are various types of HAAs and THMs, and Health Canada documents say some are probable carcinogens.

But the report says the health risks from these byproducts are much less than the risks from consuming water that hasn't been disinfected.

Johnson said the HAAs and THMs were not significantly above guidelines recommended.

"(These substances are) a concern, but not as big a concern as the chlorinating for sure," she said. "I mean Walkerton, seven people died, 2,000 people were very ill. It was all because of microbiological."

Microbiological issues—such as dangerous *E. coli* contamination that caused the problems in Walkerton, Ont., 10 years ago—can occur when water is not treated.

Johnson said steps are being taken to lower the levels of HAAs and THMs including encouraging the use of potable water-dispensing units—small-scale drinking water treatment facilities communities can cost-share with the province. Chlorine demand management is another action being promoted to lower the byproduct levels. It encourages using enough chlorine used to disinfect water, but not enough to cause HAAs and THMs.

## No rate increase

There will be no increase in taxes or water and sewer rates in Summerside, Prince Edward Island this year.

The good news was part of the city budget delivered March 29 by Deputy Mayor Bruce MacDougall.

"I think there a number of keys," in the good news budget, the city's finance committee chairman said in *The Journal Pioneer*. "The fact that there are no rate increases, the fact that there are no user fee increases and no water/sewer rate increases, that's a portion it."

The report and portal were announced during the 2010 Clean and Safe Drinking Water Workshop in Gander.

Placentia's Mayor Bill Hogan and CEO Ed O'Keefe have both stated the town is doing what it can to reduce THMs and HAAs including adjusting chlorine levels and monitoring them and is considering using a potable water-dispensing unit in the town where residents can get clean water for drinking.

"We are taking it very seriously and that's what

I wanted to get out to the public," stated O'Keefe. "We are looking at it. We are certainly investigating to see what we can do and we'd like to get something in place sooner rather than later."

Both he and the mayor noted the integrated water system planned for the town will take years but it is the right direction to help eliminate these kinds of issues.

But, as Mayor Hogan said, money is an issue, so the integrated plan may well have to come in small steps.

"It is too big a job. We'd never be able to undertake it all at once. It has to go step by step," said Mayor Hogan.

"We are close to doing what we can capital works-wise now for a couple of years and we could probably help out in Jerseyside by connecting Jerseyside and Freshwater. That's my personal preference and I would anticipate that would be our first step in doing this piecemeal," he said.

"The ultimate goal is one water supply."

(With files from *The Telegram*)



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# MODERN, EFFICIENT & HEALTHY SERVICES FOR THE FUTURE

The Halifax Regional Municipality boasts some of the oldest communities in North America, and as a result, we have some of the oldest infrastructure. Many of the underground pipes that carry our wastewater and stormwater are over 100 years old and in desperate need of repair or replacement. Much of this infrastructure is out of sight deep beneath our streets and properties, but its upkeep has to be top on our minds.

Investment in our wastewater and stormwater facilities is needed now to help protect our economy, our environment, and the health of our citizens. A new federal wastewater strategy - the Canadian Council of the Ministers of the Environment Municipal Wastewater Effluent Strategy - is bringing new and stricter environmental regulations into effect. These regulations will have significant financial and operational implications for owners of all municipal wastewater systems across Canada. With the investment to replace aging infrastructure included, costs for Halifax Water could be as high as \$1 billion dollars over the next 25 years. It is critical that we start now to bring our systems up to and beyond existing standards, otherwise future generations will pay more than their fair share.



Original Freshwater brook by a sewer line (1980)



North Dartmouth sewer replacement (2008)

As a regulated water, wastewater and stormwater utility, Halifax Water must have sufficient revenues to meet day-to-day operation and maintenance expenses, debt obligations and future infrastructure needs to maintain a high level of service to our customers and the environment.

We cannot pass on a legacy of collapsing infrastructure and the associated financial and environmental burden to our children and grandchildren. The cost to our environment and to future generations of doing nothing far outweighs the cost of acting now.

## WHAT THIS MEANS FOR YOU?

A Cost of Service Study conducted last year revealed that the current rate structure is not sufficient to maintain, operate or upgrade our wastewater and stormwater system. A report was filed with the NSUARB in late March 2010 and included a rate application for wastewater and stormwater rates. If the application is approved, the average HRM household would see rates rise by \$8.64/month or \$.31 cents/day on Oct. 1, 2010, and an additional increase of \$7.60/month or \$.25 cents/day on April 1, 2011.



### HALIFAX WATER'S WASTEWATER AND STORMWATER SYSTEM

- by the numbers
- 2170 kilometres of pipe
  - 54,000 manholes and catch basins
  - 2000 culverts
  - 180 pumping stations
  - 15 wastewater treatment facilities (including three new Harbour Solutions facilities)



## PLANNING FOR THE FUTURE

Halifax Water has a plan to ensure sustainable funding for wastewater and stormwater infrastructure within HRM that requires an increase in rates to meet our current and future needs. If approved by the Nova Scotia Utility and Review Board (NSUARB), the funds generated from the rate increase will help rehabilitate Halifax Water's wastewater and stormwater infrastructure to the world-class level of our water system. Some work is already completed, some is underway, and other projects are already identified as priorities.

## VALUE FOR MONEY

Municipalities across North America are facing this challenge as wastewater and stormwater infrastructures have degraded over the years. Timely investment now will pay big dividends in the future. Even with the rate increases we are seeking to allow us to carry out this vital work, HRM residents will still be paying one of the lowest costs for service in the country.

With the application submitted to the NSUARB, the public and interested parties are welcome to participate in the process. The NSUARB will hold a hearing June 7-9, and a final decision is expected in September.



## COST OF SERVICE STUDY

Following the transfer of the operation and assets of HRM's wastewater and stormwater system to Halifax Water in 2007, the Nova Scotia Utility and Review Board ordered a full 'Cost of Service Study' or CoSS. Utilities generally use cost of service studies to determine what funding they require to operate and, as a result, the rates charged to customers benefiting from the service.

The Halifax Water CoSS, completed in late 2009, reviewed all the services we provide to our customers - industrial, commercial, multi-residential, institutional and residential - to determine whether the costs are being charged in a fair and equitable manner.

### cost of service study results

#### WATER



- Current water rate is fair and will provide adequate funding for fiscal years 2010 - 2011

#### WASTEWATER



- Current rate is not fair and equitable. Industrial, Commercial, Multi-Residential and Institutional customers are subsidizing the residential and other customers with small meter sizes
- Current Environmental Protection charge will not cover the operating costs for all 15 wastewater treatment facilities (WWTFs) into the future
- Wastewater Management Charge does not cover the total cost of services for the wastewater and stormwater collection system
- Current rate structure does not provide funding for the rehabilitation and replacement of the current wastewater and stormwater system
- Current rate structure does not provide sufficient funds to meet all present and more stringent future regulatory standards
- The rate structure for wastewater needs to be converted to a base and consumption structure similar to water

#### STORMWATER



- Stormwater rates should no longer be based on water consumption but structured based on the user pay principle. This will be a flat rate system until data on impervious area of customers' premises can be developed. Impervious surfaces are areas that are paved or otherwise covered and do not allow stormwater to soak into the ground but direct the flow into the stormwater system



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