February 26, 2021 SPECIAL FEATURE SEWER & WATERMAIN WATER & WASTEWATER WATER & WASTEWATER

www.dailycommercialnews.com Daily Commercial News by ConstructConnect*

Tackling the Niagara Escarpment for Grimsby, Ont.'s water future



NIAGARA REGION

Aerial photo of Grimsby Water Storage System from January 2021, looking slightly towards the west. Park Road is visible running along the centre of the photo. The walls for the two 7.5 megalitre tanks are going up as well as the columns inside the tanks. To the left you can see considerable progress on the roof of tank one, tank two is to the right. Additional work still to be done includes an entrance road, fencing around the site and dirt will be placed around the outside of the walls so the tanks are below grade.

DAN O'REILLY CORRESPONDENT

\$20-million project to provide water security for the Grimsby, Ont. area and meet future population growth demands had to overcome the complexities and restrictions of building on the Niagara Escarpment.

Designed by WSP Canada Inc., the project is major enhancement of the Grimsby water distribution system which transports treated Lake Ontario water from the Grimsby Water Treatment Plant up the escarpment.

It includes the construction of a two-cell 15-million-litre, multicellular potable water storage reservoir on a 16-acre site on Park Road at the top of the escarpment, the installation of an

Economic Snapshot Vaccines and higher oil prices will energize Alberta this year and next



Looking for a classic double whammy? Well, look no further than Alberta. The combination of U.S. President Biden's Keystone Pipeline cancellation and a country-leading spike in cases of COVID-19 have hit the province with the country's second-highest unemployment rate extremely hard.

Going forward, both events will exert a significant drag on the province's nearterm prospects. However, there are several

other factors that will moderate the negative impact. First, the Keystone cancellation was no surprise. This is the second time the pipeline has been waylaid. Leading up to his election, Biden was quite clear that stopping it was high on his list of priorities.

Second, after the first wave of COVID-19 in March of last year, capital spending plans for 2020 in Alberta fell by -19% to \$48.1 billion, their lowest level in more than 14 years. The Keystone cancellation will exacerbate this pullback in non-res capital spending. However, the precipitous drop is being partially offset by a pickup in residential construction, fuelled by the country-wide surge in housing demand.

Two recent indicators suggest the impact of the second wave of COVID-19 on the Alberta economy has been more muted than the first. To begin with, the labour market has weathered the impact of the second wave of COVID much better than it did the prior one. In response to the first wave, in early spring 2020, authorities locked down the economy causing total employment to drop by a breathtaking -336,000 jobs in March and April. As a result, the unemployment rate rose from 7.8% in January to almost 16% in June.

A *second big wave of COVID-19* cases struck in early December of last year. Despite this surge, the resulting round of lockdowns caused hiring to drop by just -27,100 jobs in the final two months of the year. Subsequently, Alberta posted a gain of +21,000 jobs

interest rates and a pickup in immigration should cause housing starts to total in the range of 24,000 to 27,000 units this year and to reach between 26,000 and 29,000 in 2022. In 2020, they were 24,000 units.

Alberta's external economic environment has also brightened considerably over the past six months. The expected passage of President Biden's \$1.9 trillion fiscal stimulus package, together with the faster than expected rollout of COVID vaccines, will give a significant boost to the U.S. economy, the market for 82% of the province's exports. Also, Alberta's oil production rose by +1.8% in December to a record 18.7 million cubic meters and the price of Western Canada Select has recently hit \$50 USD, its highest level since April 2019.

Going forward, the solid +12.9% y/y increase in business incorporations in December suggests confidence in the province's future economic health is improving. Also, although active rig counts in Alberta remain depressed, the above-noted increase in oil prices and reduced constraints on pipeline capacity should 'reenergize' drilling activity later in the year.

Projects shelved by low oil prices which may be reactivated later this year include the Aspen Oil Sands Project, Suncor's Voyager South Mine and TC Energy's Heartland Pipeline Project. The *Canadian Association of Petroleum Producers* is calling for investment in exploration and production in Alberta to increase by +18% to \$11.8 billion from an estimated \$10 billion in 2020. It should be noted that this outlook for stronger growth is contingent on the province being able to obtain and successfully distribute vaccines that will reduce the spread of the COVID-19 virus as quickly as possible.

John Clinkard has over 35 years' experience as an economist in international, national and regional research and analysis with leading financial institutions and media outlets in Canada. approximately 850-metrelong, 500-mm back feed waterman along that road, and significant upgrades to the existing 3.41-million-litre reservoir and pumping station, about 800 metres south of where the new one is being built.

Construction by Mississauga-based Romag Contracting Ltd. started in February 2020, with staged infrastructure tie-ins to the existing distribution systems occurring this summer, and is expected to be completed by November.

Through a combination of reservoirs and high lift and booster pumping stations, the distribution system delivers potable water to Grimsby, the community of Beamsville in the Town of Lincoln and the West Lincoln community of Smithville—where it is stored in an elevated tank.

But a lot has changed since the plant was commissioned in 1994 as the newest one owned operated by Niagara Region at that time, says regional project manager Gino Granola.

In a 2011 water and wastewater master servicing plan, a staff report warned the Grimsby system had insufficient water storage to meet 2031 demands. The town's population is projected to reach 33,200 that year from its present level of 29,430 and the other communities are also growing, he says.

Of the 10 megalitres (ML) storage at the treatment plant, only 50 per cent is considerable to be available storage, due to constraints in "chlorine contact time" and other nearby communities cannot service the demands of the Grimsby water system, he says.

Additional floating storage is required in the Grimsby area in the event of emergencies such as fires and the 2011 staff report recommended the construction of a 15 ML reservoir to address the supply security issue. It also underlined the need for a second study to determine WSP project manager Dean Whittaker.

Erecting the new structure 50 metres higher on top of the escarpment higher keeps it out the escarpment's designated environmentally sensitive areas.

At the same time the new location came with more than a few complications, he adds.

"This 50-metre elevation difference posed unique challenges as the two reservoirs were meant to provide floating storage to service a single distribution system."

Overcoming those challenges required a comprehensive set of measures, one of which is the installation of an automatically actuated reducing valve on the 500 mm diameter watermain, connecting the new and old reservoirs.

"By equipping the pressure reducing valve (PRV) with an automated pilot actuator, the downstream pressure reducing set-up can be modified remotely for increased control," says Whittaker, explaining the remote control on the PRV is automatically set to produce a net zero differential operating level between the two reservoirs.

In order to maintain water freshness and a consistent chlorine residual throughout the Grimsby Distribution System, as well as that of the downstream Smithville one, the entire combined network has been designed as a single-pass flow-through system.

"The design measures are not exactly new technology. But are very specific to this project and the design took some thought," says Whittaker, noting it took 18 months to complete and included water modelling exercises and several site visits.

From a construction perspective, the most critical phase will be the tie-ins to the existing distribution system. At the old reservoir a temporary bypass will be connected directly to the pumping station allowing the reservoir to go offline for approximately two to three months for the installation of process pipe and valve upgrades, "which will increase water circulation and ultimately improve water quality." A combination of drone technology and traditional survey methods are being used to document the project's progress and ensure it is being built to specifications. Images taken by WSP's drone survey crew, usually on a monthly basis, are overlaid with the engineering drawings to provide very precise three-dimensional details.

in January. Also, while the province's current unemployment rate of 10.7% is still high, it has been trending lower since mid-2020.

Also, over the past three months, sales of existing homes in the province have been up by +40% compared to a year earlier due in large part to the combination of a surge in pent-up demand and record low mortgage rates. In January, average house prices in Alberta rose by +9% y/y while the inventory of homes for sale hit a fourteen-year low. The surge in demand has driven January housing starts up by +46% y/y.

Given the above-mentioned drop in nonresidential construction, it's clear that the 20% increase in construction employment over the past seven months has been primarily due to the rebound in residential building which, given the +9% increase in building permits in the final quarter of last year, will persist well into the second half of this year. The improved outlook for hiring, a continuation of low-

Real* Gross Domestic Product (GDP) Growth — Alberta vs Canada



* "Real" is after adjustment for inflation

Data Sources: Actuals — Statistics Canada; Forecasts — CanaData. Chart: ConstructConnect — CanaData.

Construct connect.

©2021 CanaData. All rights reserved.

Vol. 19, Issue 4

the best location, he says.

That process got underway a few years later with an environmental assessment which, in 2015, concluded the optimal location was the 16-acre site. Formerly agricultural land, it was ultimately purchased by the Region, says Granola.

In an ideal situation the new reservoir would be on the same site and same elevation as the old one. That wasn't possible as the existing reservoir and pumping station are located mid-way up the Niagara Escarpment and increased protective measures for the escarpment ruled out an expansion, says

Page S-3



TO BE STRONGER TOGETHER

Brock Aggregates is trusted for supplying the Greater Toronto Area with the highest quality aggregates, from sand, stone and gravel to limestone screenings, ³/₄ crush and crusher run limestone. We are widely recognized as a leader in the industry for our quality and superior customer service for over 20 years.





Plan to treat Holland Marsh fertilizer runoff stalled

IAN HARVEY CORRESPONDENT

If ints the province will shelve a \$715 million Upper York Sewage Solution (UYSS) has cast a shadow over the \$40 million storm water capture and treatment plant just announced with federal funding for Holland Marsh.

The irony is that both projects have the same goal, to reduce phosphorous run off from fertilizers used in the lush agricultural lands of Holland Marsh polluting Lake Simcoe.

For decades the run off of phosphorus from fertilizer used on farms around Lake Simcoe and Holland Marsh has created headaches in the area.

Last November the federal government made a breathless announcement of a \$16 million through the Disaster Mitigation and Adaptation Fund (DMAF) and York Region was expected to divert \$24 million to the project as part of the overall phosphorous elimination commitment related to the UYSS.

"The Holland Marsh is a 25 square kilometre agricultural area but the runoff from fertilizers enters into the canals and then the Holland River which drains into Lake Simcoe," says Mike Rabeau, York's Director of Capital Planning and Delivery for Environmental Services. The upshot is that there's an abundance of phosphate in the water and in turn spurs too much plant growth which sucks up all the oxygen in the water, depriving other plants and wildlife like fish necessary to maintain a healthy water way.

He says for years the Lake Simcoe Region Conservation Authority has calculated about six tonnes of phosphorus are pouring into the lake and putting the entire Lake Simcoe Watershed at risk of eutrophication — the process of oxygen deprivation.

"It's not coming from an outfall so you can't single it out as the source of the pollution,"

Mike Rabeau York Region

In December Georgina Council, citing concerns from Georgina Island First Nation over what they claim is "inadequate consultation," voted against the project.

It would provide water treatment for 150,000 new homes in the area but Georgina also isn't happy with the provincial growth targets the area and this is one way to put the brakes on those plans.

York has already spent \$100 million on studies and assessments but opponents want York to dump their problem down a southern pipeline to Durham Region's Duffin Creek plant which flushes into Lake Ontario. That was the original plan but the UYSS project had originally come about when the province insisted that York need to find a local solution to a local problem.

"Normally this is not part of our business," he says, "we would not be involved but because we are a waste water and water treatment business."

It happens anywhere there are large bodies of water surrounded by farming, he says, and is called non-point source contamination.

"It's not coming from an outfall so you can't single it out as the source of the pollution," he says, and the agricultural operations are too important in terms of jobs and food to shut down.

"We get some bad press but we have done all we can do,"

Mike Rabeau

York Region

York environmental services was peripherally involved in some of the discussions over the years because at one time it was thought that their treatment plants were a significant source of phosphorous being discharged into the lake.

However, he says, over the years many upgrades and adjustments have been made the plants discharge less than three per cent of the phosphorous going into the watershed.

"We get some bad press but we have done all we can do," he says and notes in 2014 York proposed the Upper York Sewage Solutions which would be the first municipality in Canada to adopt leading-edge microfiltration and reverse-osmosis wastewater treatment technology with purified, clean water going into the East Holland River.

The plan is to build a Water Reclamation Centre in the Town of East Gwillimbury and implement at a Total Phosphorus Off-setting Program to further remove phosphorus from other sources within the Lake Simcoe watershed by retrofitting several existing stormwater with low-impact development technologies to remove three kilograms of phosphorus for every one kilogram of additional phosphorus the Water Reclamation Centre discharges to the watershed above a threshold of 124 kilograms per year.

That apparently isn't good opponents in York Region. UYSS has been waiting since 2014 for approval with funding in place and some of that funding was going to pay for the storm water capture and treatment plant, says Rabeau.

However, that project can't proceed until the UYSS fate is decided.

If it is killed the province needs to permit diversion of those funds for the storm water run off plan.

Engineering for the storm water facility hasn't been done but in general terms it would be divert water from the canal to settling ponds where chemical treatment would extract phosphorous to be resold commercially.

It's a Catch-22 situation for York Region which is now waiting to see which way that decision goes and is no further ahead than it has been since 2014.



GLOBAL CORPORATE SPECIALTY

A partner you can trust

Managing the success of your construction business can be challenging in today's evolving marketplace. When you partner with Aviva you can count on us to provide you with strategic surety bond solutions, backed by extensive knowledge, expertise and strong partnerships focused on the long-term. We are committed to helping you meet your business goals. Contact your broker to learn more. Aviva.ca/gcs





"I Trust SONOpan for my Soundproofing Projects"

APPROVED BY



BRYAN BAEUMLER

@SONOpan_msl F 🔼 💓 🧭

Waterloo Region wastewater plants turn to cogeneration power

DAN O'REILLY CORRESPONDENT

The Region of Waterloo is reducing its environment footprint with a project intended to decrease electrical costs at its three largest wastewater treatment plants.

While the complications created by the global pandemic have set the construction timetable back by four to six months, a \$24.1-million project to install cogeneration units at the Kitchener, Galt, and Waterloo plants is now in its final stages, with commissioning expected in the next few months.

Jacobs Engineering Group is the consultant overseeing the design and construction of the systems and W.A. Stephenson Mechanical Contractors Ltd. is the general contractor.

Comprised of pre-fabricated combined heat and power (CHP) engines, air, gas, and selective ccatalytic reduction systems, switchgear, and other components supplied by European and American manufacturers, the units will be fueled by biogas, a waste product expelled during the treatment process, says the region's manager of engineering and wastewater programs, Trevor Brown.

The gas conditioning systems will remove compounds from the biogas, like moisture and chemicals, to help prevent premature wear and tear on the engines, he says.

Although some connections are still required, an 800 kilowatt engine has been installed in Kitchener, which is the Region's largest wastewater treatment plant, with 600 kilowatt engines each at Galt and Waterloo. The engines and supporting equipment are housed within noise-dampening containers, while onsite assembly was required for the gas conditioning systems.

The project has required civil engineering site work, electrical connections and the pouring of the concrete pads the units sit on.



The Region of Waterloo plans to install cogeneration units at its three largest wastewater treatment plants in Galt, Waterloo and Kitchener pictured here.

But that work has not impacted the plants' day-to-day plant operations, outside of short durations to make connections to the existing infrastructure.

"Cogeneration is a process enhancement," he explains.

The units will provide supplementary electricity to power the plants at a lower cost than is available from local electrical utilities, as well as reducing their reliance on those conventional supply systems.

Another major benefit is that the heat generated from the engines will be used to preheat the digesters system which has to be heated to 35 C to maintain its effectiveness, he says.

"Anything that can be done to offset the heating requirements is an operational savings."

Combined, the three biogas cogeneration facilities will produce about 12,000 megawatt-hours of electricity every year, which is the amount of electricity used by 1,200 houses per year.

They will also reduce the Region's greenhouse gas emissions by about 550 tonnes of carbon dioxide each year, equivalent to taking around 115 cars off the road, he says.

In explaining why the region embarked on the project, Brown points out that wastewater treatment is a high energy user and hydro costs is "one of the biggest line items" in its operating budgets.

Annually, those costs are in the \$5 million range with the Kitchener, Waterloo, and Galt plants accounting for about 75 per cent of that figure, he says.

Once the units are fully operational, they will provide an immediate return on the plants' operating expenses in the form of reduced electrical rates. The payback on the capital investment will take between nine to 11 years, says Brown.

Planning began in 2015 with detailed engineering studies which determined the feasibility of the project, examining issues such as the sizing of the units, potential electrical savings and associate costs. Preliminary design began in the spring of 2016, with detailed design getting underway the following year.

Construction commenced in early 2019 and "continued smoothly" until mid-March of last year when the COVID-19 pandemic shutdown threw up more than a few hurdles.

New safety measures had to be quickly implemented, such as physical distancing, masking, and wellness screening, which did have an impact on scheduling and coordination of on-site contractors, which in turn has had an impact on the overall project schedule.

Early on in the pandemic, the general contractor encountered shortages in the availability of labour, materials, equipment, such as personal protection equipment.

And, with implementation of travel restrictions, border closures, and mandatory 14-day quarantine requirements, it has become difficult to arrange site visits from the suppliers to conduct the pre-commissioning and commissioning. The suppliers include 2G, the German manufacturer of the CHP engines and BioSpark, the American manufacturer of the catalytic reduction systems.

"We have has some success in getting these experts to site for this essential work. However, this continues to be an ongoing challenge."

Asked about the technology, Brown explains that harnessing biogas to produce both electricity and heat is not new and it is being used around the globe, mostly at large facilities due to economies of scale.

"There are wastewater facilities in the world that are now operating 100 per cent off the electrical grid and generate all the electricity they need for their operations."



Let Us Help You Create and

Head Office: 60 Pippin Road, Unit 34

- Vaughan, Ontario Canada
- L4K 4M8

Sales/Showroom:

#3-2359 Queen Street East Toronto, Ontario Canada M4E 1H2

Sales/Showroom: 90 Saunders Road, Unit 7

Page S-6

Display The Image That Your Company Deserves

- Consult
- Project Manage
- Permit
- Install

- Manufacture
- Fabricate
- Design
- Service

Barrie, Ontario Canada L4N 9G8

Manufacturing Facility: 137 Buttermill Avenue Vaughan, Ontario Canada L4K 3X5

www.gregorysigns.com