

New Mechanical Wastewater Treatment Facility

CONTACT

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- City of Lloydminster

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Year awarded: 2023

Project video: April 2017 to December 2023.

Project video: <https://youtu.be/kRAiaBK6sU?si=3Dcq9CLvKf1FjB6>

THE PRACTICE

What was the issue?

Changing regulations are a routine challenge for municipalities, but it is seldom that these challenges come with the risk of legal consequences for a mayor and council. A new wastewater treatment facility was needed for the City of Lloydminster to comply with Canadian environmental effluent water-quality requirements, which came into effect on July 1, 2017, with consequences for non-compliance ranging from fines to potential imprisonment for the city's mayor.

Through Environment and Climate Control Canada's (ECCC) Enforcement Branch, the Government of Canada delivered a clear directive to the City of Lloydminster to improve the quality of its wastewater to meet current standards or risk the legal financial consequences of continued non-compliance. The existing wastewater treatment system was established more than 30 years ago. Through months of diligent research, it was determined that even with significant upgrades, the existing wastewater facility could not reasonably be enhanced to meet new effluent standards, therefore, a new facility would be required.

Weighing urgency and the city's fiscal limitations, municipal leadership stepped outside the box of regular planning and procurement methodology to craft an achievable plan.

In April 2017, Lloydminster city council passed a motion officially naming the wastewater treatment plant as its top infrastructure priority. This project would remain the City of Lloydminster's highest priority until requirements were fulfilled.

What was the project?

As city council and administration came to terms with the elevated urgency to improve its wastewater capabilities, the city conducted a thorough assessment of its existing facilities - in conjunction with diligent research into current industry practices and technologies.

Following months of discussion with both provincial and federal leaders, in mid-2019, the City of Lloydminster secured four funding agreements totaling \$49M between the Government of Saskatchewan, the Government of Alberta, the Government of Canada and the municipality to build a new wastewater treatment facility. With the City's contribution, the project budget was set at \$81.5M.

To obtain the best value, the city chose the highly innovative, collaborative and relatively new project delivery methodology called Integrated Project Delivery (IPD), which allowed and committed the IPD partners to carefully consider all options, costs, risks, etc. Lloydminster was the first municipality in Canada to utilize this methodology on a wastewater facility of this scale.

Planning for the new facility began in earnest in January 2020 when selected project partners came together to familiarize with IPD model and form the project team.

THE PROCESS

The city has a fixed budget that cannot be exceeded. To obtain the best value for the dollar spent the city decided to use the highly innovative, collaborative and transparent IPD approach. The primary vendors, or signatories to the CCDC30 Integrated Project Delivery agreement were all competitively procured using Qualifications Based Selection (QBS). This was the first wastewater project to utilize CCDC30. The Validation Phase allows the complete IPD team (Owner, Consultant, Contractor, and Other Parties) to carefully consider all options, costs, risks, etc., based on value. This allows for certainty without having to design and tender the project. Once the project is validated the design/construction team will start the design based on the validation report. The IPD team continuously evaluated project options based on a "Best for Project" approach. This means that local contractors, vendors, and labour can be more cost effective for the project if they are able to meet quality and other project standards. Local vendors and suppliers were encouraged to monitor the city's bids and tenders and other postings to see what work was put out for competitive procurement.

A multi-jurisdictional, bi-provincial project of this scale and significance required leaders from all levels of government to collaborate in understanding Lloydminster's unique needs and challenges. With the Mayor of Lloydminster often acting as a liaison, the city was successful in bringing all parties to the table in achieving a fair agreement that

benefited residents of both Alberta and Saskatchewan while also protecting the environment by constructing a facility that will significantly improve the quality of treated effluent entering the North Saskatchewan River for decades to come. Key staff formed the Senior Management Team (SMT) and the Project Management Team (PMT) as part equal partners to these roles. In addition, other city staff members were part of the numerous Project Implementation Teams (PITS). The PITS were developed to solve certain parts of the project such as procurement, design of process systems, constructability, electrical, mechanical, etc. Having staff involved in the project brought better value in the product results seen; parties understood what was being completed and partook in decision-making process.

IPD partners included:

- Chandos/Bird Joint Ventures (General Contractor)
- ISL Engineering and Land Services Ltd (Design Engineer)
- Veolia Water Technologies & Solutions (Technology Vendor)
- Magna IV Engineering Inc. (Electrical/Controls/Systems Integration) and
- City of Lloydminster (Owner).

What resources were involved?

Financial: Four (4) funding partners

1. Federal Government
2. Province of Saskatchewan
3. Province of Alberta
4. City of Lloydminster.

Human skill and labour force:

1. City Council
2. City Administration
3. General Contractor
4. Design Engineer
5. Technology Vendor
6. Electrical/Controls/Systems Integration.

Large Meeting space (Big Room) for the IPD Team discussions and decisions, however COVID-19 pandemic interruption required digital collaboration tools and changing to online meetings.

THE RESULTS

The most measurable community benefit of the IDP practice in this project was the cost savings, estimated at \$10 million to \$15 million when compared to costs likely incurred through a traditional design-build approach.

The unique approach in what IPD is based on, is felt throughout the project team and others that had a role to play in the design and construction. Local contractors and suppliers all have questioned why this project is different; different being in a good way as they feel their role is important and they have a say in how the work they provide but also what others need to provide to support them (support they provide others as well as support they require is openly communicated). Not just being asked to come into a project and complete a task(s) but being part of the scheduling of the work and quality control, safety as a whole and not just within their work area. Additionally, this collaborative work process contributed to two very successful food and toy drives that all parties were proud to support with contributions made to the community, specifically one of the local food banks.

Once complete, this project creates opportunities with neighbouring municipalities that the city will be able to receive regional wastewater from once the facility is constructed.

The City of Lloydminster shall ensure that all improvements and upgrades to the WWTF are completed and fully commissioned, and that effluent quality being discharged to the North Saskatchewan River is fully compliant with the Wastewater Systems Effluent Regulations (WSER) by no later than December 1, 2023.

One of the most powerful indicators of the project's success is that zero change orders were required to deliver the project on time, and on budget. The team worked collaboratively to resolve supply chain and inflationary issues, and as a result, received additional processing equipment valued at \$5 million-\$10 million with no additional costs to the project budget and the city. A malleable approach allowed the team to adapt to significant supply chain issues such as a six-month delay to delivery of a pre-engineered structure without impact on the timeline.

LESSONS LEARNED

All major infrastructure projects face deviations and challenges, however, the emergence of a pandemic at a critical early phase brought the threat of a major disruption. Fortunately, the IDP team was able to pivot quickly, embracing online collaboration technologies which - at the time - were largely unfamiliar to many. The team also faced supply chain issues, and communication with provincial and federal authorities became more challenging as those governments grappled with their own pandemic challenges. Ultimately, thanks to the exceptional collaboration, communication and innovation, the project was able to proceed with zero disruption to costs and schedules.

The depth and scale of the collaboration required in the planning phase of this project cannot be overstated. This project reflects the true value of partnership in virtually every way, from the way it was funded, to the methodology for design and construction. As the first municipality in Canada to implement IDP for a project of this scale, the City of Lloydminster is committed to sharing key learnings from the project among other

municipalities and organizations hoping to achieve the same successes realized in Lloydminster's project. Communities already seeking to learn from Lloydminster's success include the City of Saskatoon (Saskatchewan), the City of Winnipeg (Manitoba), the City of St. Albert (Alberta), the City of Barrie (Ontario), and ATCO Group.

ADVOCACY - City has learned much about the value of persistence in advocating for important community needs among higher levels of government, and working with elected officials to ensure the need is understood and receives due consideration.

SOLUTION FOCUS - The City has seen the benefit of a true solution-based approach, supporting a culture that focuses on resolving problems and does not seek to place blame.

COST CERTAINTY - Project budget is confirmed early, and the project strives to find efficiencies or added benefits along the design and construction.

ADAPTABILITY - Using collective brainpower and industry knowledge to navigate unstable economic and supply challenges.