



BLOOM LAKE MINE

2018 CANADIAN CONSULTING ENGINEERING AWARDS
Project Management

BBA

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Complexity

DEALING WITH UNEXPECTED ISSUES

In early 2016, Champion Iron, the development and exploration company behind Quebec Iron Ore, became the owner of the Bloom Lake Mine facilities and iron concentrator near Fermont, Québec.

In May 2017, Quebec Iron Ore (QIO) chose BBA as a partner on its integrated team that was mandated to re-start iron ore mining operations at Bloom Lake. The mandate included project management, various detailed engineering tasks, project procurement, the supervision of electrical construction work, the administration of various construction contracts and commissioning preparations.

This project presented a number of challenges due to its scope, tight deadlines and the large number of consultants and contractors involved, which made planning work and managing costs more complex.

Significant procurement challenges

With a commissioning date of March 2018, BBA faced significant project procurement challenges due to the tight schedule. For example, a portion of the tailings piping was coming from the United States. However, Hurricane Irma, which caused significant damage in fall 2017, hit the workshops that the mine had mandated to manufacture the piping, which was to be shipped to the Bloom Lake Mine. Consequently, working in close collaboration with Quebec Iron Ore, BBA teams had to work relentlessly to quickly find other suppliers to get the job done, while meeting tight deadlines.

Knowing how to react

In the course of the project, changes and new tasks were necessary to meet the project challenges. The BBA team, in collaboration with the QIO team, had to be creative in order to incorporate new work while ensuring that the project would be delivered on time. For example, just three months before operations re-started, the inspection of existing facilities revealed that an ore chute of over 30 metres high was at the end of its useful life and had to be replaced, requiring structural reinforcement and the coordination of manufacturing, mechanical and electrical works.

Empowering the client

Lastly, the commissioning execution plan, part of the Operational Readiness activities and prepared by BBA, had to be clear and detailed enough so the client could carry it out without constant support from our experts. BBA proposed a plan based on a new graphic approach using colours to illustrate the

Complexity

various commissioning steps, along with a detailed procedure for each one.



Meeting Client's Needs

DEMONSTRATING FLEXIBILITY AND AGILITY

BBA's project management knowledge and, more specifically, mine facility commissioning know-how, led to smooth and flexible cost planning and management. Thanks to our engineering and project execution expertise, combined with the drive of Quebec Iron Ore's project team, we were able to improve several aspects of the project, for example, by optimizing control loops, adding automatic samplers and making certain piping modifications. These improvements made it possible to reach the production performance targets earlier than expected, while reducing operating costs over the longer term.

For the duration of the mandate, the team worked quickly and efficiently to allow the client to reach its objectives. For example, when a firm informed Quebec Iron Ore that it would not have enough time to perform the pre-operational verifications of certain equipment as per the established schedule, BBA reacted promptly and, over one weekend, a task force was put together using resources from BBA's various Québec offices. The team successfully rose to the challenge and the new equipment was delivered to the commissioning team on time.

Note that iron ore production re-started on February 16, 2018. Satisfied with the services provided, the client continues to mandate BBA's team in Labrador City for operational support.

Environmental Benefits

ADDED-VALUE ENVIRONMENTAL SUPPORT

While they did not contribute directly to the project's environmental aspects, our teams were involved in the installation of several surface water pumping stations. The Bloom Lake Mine has to collect water that has been in contact with ore extracted from the mine as well as with tailings. The site is equipped with a large number of pumping stations because the mine is surrounded by over a dozen lakes. This complex water and tailings management system is now illustrated using BBA's new methodology, which allows for easier comprehension of the system operation.

Thanks to our tailings pumping experts, the client substantially reduced the foreseen investments by tens of millions of dollars by optimizing existing pumping and piping equipment in order to comply with the requirements of the tailings deposition plan.

We would also like to mention that BBA supplied the services of a contract administrator to help manage the construction activities for new dams, which were essential for the execution of the tailings deposition plan. This assistance enabled Quebec Iron Ore's environmental manager to manage construction costs appropriately and to stay within the allocated budget.

Our efforts contributed to the success of the re-start of iron ore production activities at Bloom Lake Mine, all in accordance with current environmental standards.



Innovation

A VISUAL COMMISSIONING STRATEGY

The proposed commissioning plan, part of the Operational Readiness Strategy, is based on an innovative approach that illustrates the various commissioning steps by means of graphs and colours. These synoptic diagrams depict the entire iron ore production process: crushing, concentrating, car loading, services, reagents and water and tailings management.

BBA's primary objective was to maximize the client's involvement in commissioning activities. During preparation meetings with the client, the commissioning strategy was communicated and explained using the synoptic diagrams in order to ensure a shared understanding of the various steps necessary to restart iron ore production and to validate the sequence of these steps.

Subsequently, detailed commissioning procedures for each of these steps were prepared. Each procedure identified potential risks, required prerequisites and the activities to be carried out during the various steps.

As such, Quebec Iron Ore's operational and maintenance staff performed the commissioning steps for the various iron ore production facilities including crushing, concentrator activities and tailings pumping. The block diagrams and detailed procedures allowed the client to take on the commissioning activities based on the sequence developed and to do so entirely on its own. A true success!

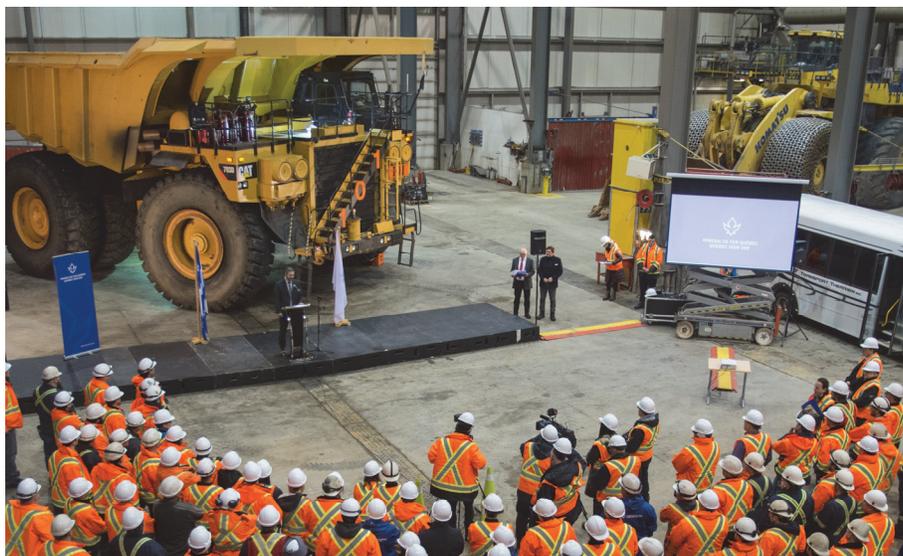
Social and Economic Benefits

BOOSTING PROSPERITY ON THE NORTH SHORE

This project resulted in 450 workers being hired at the Bloom Lake Mine. The region perceives the mine's reopening as the start of a new era of prosperity on the North Shore. The economic spinoffs will be considerable, particularly for regional contractors in Fermont, Labrador City, Sept-Îles and Baie-Comeau, who contributed to resuming activities and who will continue to support production activities thereafter.

When electrical construction activities were added to the project, BBA went the extra mile to make sure indigenous companies were well positioned to compete for the mandate. In the end, a team of electricians from Shetush Ondel, a company with indigenous roots in the Sept-Îles region, was chosen. Also worth mentioning are the spinoffs tied to the rail transportation of the iron ore, which will pass through the new Pointe-Noire multi-user port facilities in Sept-Îles.

The future is looking bright for the Bloom Lake Mine. Quebec Iron Ore has signed an agreement with Sojitz Corporation, a large Tokyo-based firm, which forecasts sales of three million tons of iron per year, i.e. 40% of Bloom Lake Mine production. Furthermore, the mine's phase 2, a project that was suspended when the mine closed in 2014, offers Quebec Iron Ore a future opportunity to double annual production.





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