



NORTHERN NEIGHBORS

Compiled by Shane Lasley



SEABRIDGE GOLD INC.

Technicians log core from drilling at the Deep Kerr deposit in 2015. This large and higher grade copper-gold deposit is not included in the 38.8 million ounces of gold and 10.2 billion pounds of copper reserves contemplated by the 2016 pre-feasibility study for Seabridge Gold Inc.'s KSM project in northern British Columbia.

PFS outlines 53-year mine at KSM

Seabridge Gold Inc. Sept. 19 provided results of an updated preliminary feasibility study for its KSM copper-gold project in northwestern British Columbia. The 2016 PFS incorporates many design improvements over the 2012 PFS and the updated financial projections confirm that KSM is an economic project at current metal prices. The PFS envisions a combined open-pit/underground block caving operation with a 53-year mine life. During the first 33 years, the majority of ore would be derived from open-pit mines with the tail end of this period supplemented by the initial development of underground block cave mines. Ore delivery to the mill during years two to 35 is expected to average 30,000 metric tons per day. After depletion of open pits, the mill processing rate would be reduced to 95,000 tpd for 10 additional years before ramping down to just over 60,000 tpd for the balance of the operation envisioned. Over the entire 53-year mine life, ore would be fed to a flotation and gold extraction mill that would produce a gold-copper-silver concentrate that would be transported to nearby Stewart for shipment to Pacific Rim smelters. Metallurgical testing demonstrates that KSM can produce a clean concentrate with an average copper grade of 25 percent and a high gold and silver content, making it readily saleable. A separate molybdenum concentrate and gold-silver doré would be produced at the KSM processing facility. This operation is expected to average 540,000 ounces of gold, 156 million pounds of copper, 2.2 million oz. silver and 1.2 million lbs. of molybdenum per year. Initial capital cost to develop the mine, including contingency of US\$671 million and preproduction mining costs, is estimated at US\$5 billion, about 12 percent lower than the initial capital estimate in the 2012 PFS. Sustaining capital over the 53-year mine life is estimated at US\$5.5 billion and is dominated by capitalizing the underground mine expansions midway through the mine life for the Mitchell and Iron Cap block cave. Using base case assumptions – US\$1,230/oz. gold, US\$2.75/lb. copper, US\$17.75/oz. silver, US\$8.49/lb. molybdenum and a US80 cents per Canadian dollar – this operation produces a post-tax net present value (5 percent discount) of US\$1.5 billion and an internal rate of return of 8 percent. “Base case estimated total cost, at US\$673 per ounce of gold produced, remains well below the industry average for operating mines,” said Seabridge Gold Chairman and CEO Rudi Fronk. “The base case after tax payback period is approximately 6.8 years, a remarkably low 13 percent of the 53-year mine life and a key benefit to large producers. Overall, the 2016 PFS confirms that KSM is an economic project with an unusually long life in a low-risk jurisdiction.” This PFS does not include material from recent higher-grade discoveries at Deep Kerr and Iron Cap Lower Zone deposits, which are expected to have a positive impact on proj-

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DEVELOPMENT

Digitizing Donlin?

Barrick, Cisco partnership aims to advance mining into the Digital Era

By SHANE LASLEY

Mining News

Barrick Gold Corp. and Cisco Systems Inc. have formed a partnership that will likely influence every facet of Donlin Gold, a world-class mine project in Alaska on pace to go into production in 2022.

The collaboration, announced Sept. 12, aims to apply Cisco's cutting-edge digital expertise to Barrick's current and future world-class gold mines.

At this envisioned 21st Century gold mine, shift supervisors are quickly apprised with real-time updates and videos delivered to a handheld device; haul truck drivers receive their new assignments, complete with route and speed instructions, via the computer display on the dash of their remote operating chair; mechanics access maintenance manuals and order parts with their digitally enhanced safety glasses; and mill operators optimize recoveries based on real-time monitoring.

In addition to digitizing the mines, the technology will network Barrick's global office in Toronto with its regional offices and mining operations around the globe.

Barrick believes the efficiencies resulting from this digital re-invention will push its global operating costs down to US\$700 per ounce of gold, a quantum improvement over the current US\$800/oz. costs.

“Harnessing the potential of digital technology will unlock value across our business, helping us grow our free cash flow per share. In so doing, we will make ourselves into a leading 21st Century company – enhancing productivity and efficiency at our mines, and improving decision-making and performance across every area of our business,” said Barrick Executive Chairman John Thornton.

Digitizing Cortez

Long before Donlin Gold workers will don digital safety glasses, and network with each other and corporate offices from tablets, Barrick Gold will implement digital technology at its current operations around the globe.

Barrick's Cortez gold mine in Nevada will be the first to be digitally upgraded. This application of Cisco's world renowned network technology into every facet of the operation is expected to result in more efficient and safer mining.

“For instance, advanced sensing technology and real-time operational data will be used to inform decision-making. Equipment will be automated for increased productivity, while predictive algorithms will enhance the precision and speed of maintenance and metallurgy,” Barrick and Cisco explained.

In addition to efficiencies that improve the bottom line, Barrick sees real-time monitoring as a way to improve a mine's environmental performance and the company's transparency.

“We mean to create value and push the boundaries of our industry in entirely new ways,” said Thornton. “Just as importantly, digital technology will allow us to reduce our environmental impact and be even more transparent with our local partners — especially indigenous communities, local governments and NGOs.”

Building on the Cortez mine experience, Cisco



NOVAGOLD RESOURCES INC.

If partners Barrick Gold Corp. and Novagold Resources Inc. develop a mine at the nearly 40-million-ounce Donlin Gold project, this tent camp in the heart of Alaska's Yukon – Kuskokwim region will be transformed into ultramodern networked facilities that likely would be a model for future mining operations.

will support Barrick's vision of digitizing its entire global network of mines and offices.

Future glimpse

With the digitization of Barrick's mines still in its infancy and Donlin Gold owned by a joint venture with Novagold Resources Inc., it is too early to say how many of the innovative digital mining technologies being spearheaded at the Cortez Mine would be incorporated into the proposed mine in Alaska. However, any cutting-edge ideas that lower costs, bolster productivity, improve safety and safeguard the environment would be embraced by both partners.

If proven effective and adopted by the Donlin Gold JV, what might working at a digitized Donlin Gold Mine be like? Barrick envisions a network inside such a futuristic mine that provides workers on all levels with real-time data that allows them to work safer and more efficiently.

In such an ultramodern mine, supervisors coming on shift are able to quickly assess the current status of the operation with updates, live metrics and video feeds accessible from a handheld computer.

Heavy equipment operators report to a climate-controlled facility, where they get assignments and updates directly to their tele-remote operating chairs.

Mechanics are able to access repair manuals and 3D diagrams of the equipment being serviced directly with their Google Glass safety glasses. And ordering parts could be done in the blink of an eye.

Continuous water monitoring allows shift supervisors to quickly respond to the slightest anomalous changes in samples, making proper adjustments or repairs before an environmental problem occurs.

With a development decision for Donlin Gold a little more than a year away, it is not hard to imagine many of these modern technologies being built into this world-class mine in Alaska – an operation that may prove to be the model for the future of mining.

“We are going through the greatest technology and business transition ever – the Digital Era – which will dwarf the Information Era and the value of the Internet to date. Any company that fails to reinvent itself by harnessing digital technology will soon be left behind,” said Cisco Executive Chairman John Chambers. “Barrick has long been known for its focus on innovation, and with Cisco's advanced technologies and strategic network of partners, we can extend the frontiers of the natural resources industry.” ●