

Cigar Lake Operation



Cigar Lake is the world's highest grade uranium mine. Commercial production was declared in May 2015 following a decade of development.

The mine ramped up to its annual licensed capacity of 18 million pounds in 2017.

- Cigar Lake shipped its first ore slurry on March 13, 2014
- Production method is an innovative jet boring system developed by Cameco for the unique mining conditions at Cigar Lake
- Produced its full capacity of 18.0 million pounds of uranium concentrate (Cameco's share 9.0 million pounds) in 2017, achieving our forecast.

cigar lake operation facts

Location

- 660 km north of Saskatoon

Ownership

- A joint venture of Cameco (50%), Orano Canada Inc. (formerly AREVA Resources Canada) (37%), Idemitsu Canada (8%) and TEPCO Resources (5%)
- Operator: Cameco

Workforce

- Cigar Lake has 350 Cameco employees and around 230 permanent and project-related contractors. About half of the workforce are residents of Saskatchewan's north

History

- Deposit discovered in 1981
- Construction period 2005-2013, interrupted by water inflows in 2006 and 2008
- First ore slurry shipped to McClean Lake on March 13, 2014
- First Cigar Lake uranium oxide packaged in October 2014
- Commercial production declared May 1, 2015
- Reached full production of 18 million pounds in 2017

Outlook for 2018

- Resume surface freeze drilling and advance planning and construction for freeze plant infrastructure expansion to support future production
- Transition to two new production crosscuts tunnels and backfill two crosscut tunnels where production is complete



Cigar Lake's environmental monitoring program confirms the operation's environmental performance is meeting all regulatory criteria.

Jet boring progress key to Cigar Lake ramp-up success

At Cigar Lake focus remains on achieving consistent and reliable operation of the three jet boring machines deployed underground.

The jet boring system (JBS) involves purpose-built machines that travel on rails within a production tunnel. The machines use piping to deliver high-pressure jets of water to carve out frozen ore located 30 to 40 metres above the production tunnel.

► Facts about jet boring at Cigar Lake

- Water coming out of the jetting tool travels at supersonic speed
- Breaking up frozen rock, ore and clay requires a controlled jet of water at 15,000 pounds per square inch and a flow rate of 260 gallons a minute
- Approximately 75% of the water used in jetting is recycled
- Each JBS requires the combined pumping power of four 800-horsepower electric motors
- Process produces so much kinetic energy that ore and rock previously frozen to -5°C to -15°C reaches a temperature of 10 to 15°C by the time it enters the JBS storage tank



Jet boring is a non-entry mining method that allows frozen ore to be mined from a production tunnel located about 30 to 40 metres beneath the orebody.



Water control and safety ensured through ground freezing process

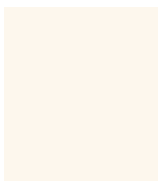
Cigar Lake utilizes bulk freezing of its ore body from surface. Freeze holes are drilled from surface down 465m in a grid pattern of approximately 6x6m and freeze piping is installed to transport brine underground at a temperature of -30 degrees Celsius. The cold brine freezes both the sandstone and the orebody to a temperature between -5 to -20 degrees Celsius.

All the freezing is completed before mining takes place in a specific area. This helps ensure that any weak rock is stronger when removing ore from the orebody, and cuts off water from entering the mine workings. As such, freezing is a key control to mitigate risk of water inflow into the mine and a very important safety system for Cigar Lake.

cameco
update

www.cameconorth.com
306.956.6200 (Saskatoon)

community
liaison
representatives



Vacant
Hatchet Lake FN/
Wollaston



Ricky Robillard
Black Lake FN/
Stony Rapids



Margaret Noey
Fond du Lac

