Cameco

Cigar Lake Project

Northern Saskatchewan, Canada

National Instrument 43-101

Technical Report

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UNITS OF MEASURE AND ABBREVIATIONS

a .... annum (year)
% .... percent
° .... degrees
°C .... degrees Celsius
cm .... centimetres
d .... day
e%U_3O_8 .... equivalent percent uranium oxide
g .... grams
g/cm^3 .... grams per cubic centimetre
g/m^3 .... grams per cubic metre
g/L .... grams per Litre
h .... hour(s)
ha .... hectares (10,000 square metres)
HP .... horsepower
Hwy .... highway
IRR .... internal rate of return
K .... thousand
kg .... kilograms
km .... kilometres
km/h .... kilometres per hour
km^2 .... square kilometres
kV .... kilovolts
kW .... kilowatts
L .... litre
lbs .... pounds
M .... million
Mt .... million tonnes
m .... metres
m^2/t/d .... square metres per tonne per day (thickening)
m^3 .... cubic metres
m^3/h .... cubic metres per hour
m^3/s .... cubic metres per second
m%U .... metres times per cent uranium
m%U_3O_8 .... metres times per cent uranium oxide
masl .... metres above sea level (elevation)
mm .... millimetres
MPa .... megapascal
Mt/a .... million dry tonnes per year
MW .... megawatts
N .... newton
NPV .... net present value
Pa .... pascal (Newtons per square metre)
ppm .... parts per million
P80 .... 80% passing (particle size nomenclature)
st .... short tons
SX .... solvent extraction
t .... tonnes (metric)
t/h .... tonnes per hour
t/d .... tonnes per day
t/a .... tonnes per year

U	uranium
% U	percent uranium (% U x 1.179 = % U_3O_8)
U_3O_8	uranium oxide (yellowcake)
% U_3O_8	percent uranium oxide (% U_3O_8 x 0.848 = % U)
Cdn$	Canadian Dollars
Cdn$ M	million Canadian Dollars
US$	US dollars
US$ M	million US dollars
$/t	Canadian dollars per tonne
US$/lb	US dollars per pound
US$/t	US dollars per tonne
wt%	percent solids by weight
>	greater than
<	less than

1 SUMMARY

1.1 Preamble

In March of 2010, Cameco prepared and filed a technical report for the Cigar Lake project (2010 Technical Report), based on scientific and technical information available at that time. Since the 2010 Technical Report, there have been further advancements and changes in the Cigar Lake project.

This technical report is based on the scientific and technical information and field experience gained since the 2010 Technical Report. It includes an update of the actions Cameco took following the 2010 Technical Report to realize opportunities identified at that time to progress towards production. Some of the key highlights include:

- The Cigar Lake project is on track to move from development to production and Cameco plans to begin commissioning in ore in mid-2013, with the first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013. Cameco expects to ramp up to the full production rate by the end of 2017. Full annual production of 18 million pounds is expected to be achieved in 2018. See Section 16.3 for more details.
- There is a change to the production profile, with slightly lower production expected in the first years of the project offset by higher production in the later years. Cameco expects its share of production in 2013 to be about 0.3 million pounds. This compares to Cameco's previous estimate of one million pounds. This and other revisions to Cameco's production schedule represent an 8.7% decrease in Cameco's production forecast through 2016 and are as a result of the extended period required for remediation, a better understanding of the geology and lower grades in initial production panels. See Sections 16.3.5 and 16.3.6 for more details.
- The economic analysis results in an estimated pre-tax net present value (NPV) at a discount rate of 8% to Cameco, for net cash flows as of January 1, 2012 of $1.4 billion for its share of Mineral Reserves. The pre-tax internal rate of return (IRR), also calculated from January 1, 2012, is estimated to be 32.8%. See Section 22.1 for more details.
- There is a decrease in the estimated average cash operating costs per pound - from $23.14/lb in 2010 to $18.57/lb. The reduction in the estimated operating costs is primarily due to the agreement to mill all Cigar Lake Mineral Reserves at the McClean Lake mill. See Section 21.3 for more details.
- Cameco's share of the aggregate capital cost estimate has increased by $192 million - from $911.7 million in 2010 to $1.1 billion. The estimate includes historical costs since 2004 as well as costs going forward from January 1, 2012. The increase is primarily as a result of the implementation of the surface freeze strategy, general cost escalation, costs to upgrade and

expand the McClean Lake mill and improvements to the mine plan. See Section 21.2 for more details.

- Cameco's share of the remaining capital and other costs to complete the Cigar Lake project is estimated to be \$483.6 million, including \$428.9 million of capital costs and \$54.7 million of standby costs. See Section 21.2 for more details.
- Cameco received regulatory approval of the revised Cigar Lake mine plan. See Section 20.3 for more details.
- Cameco completed an updated Mineral Reserve and Mineral Resource estimate. Cameco's share of the Mineral Reserves went from 104.7 million pounds in 2010 to 108.4 million pounds in 2011, due to a 4% decrease in tonnes of diluted ore and a 8% increase in average grades. Cameco's review of the Mineral Resource and Mineral Reserve classification based on recent drilling resulted in an upgrade of Probable to Proven Mineral Reserves in terms of total contained pounds U_3O_8 (53% Proven / 47% Probable in 2011 as compared to 35% Proven / 65% Probable in 2010). See Sections 14 and 15 for more details.
- Cameco completed the underground remediation plan and work is proceeding on all pre-inflow activities for both underground development and construction. See Section 16.2 for more details.
- Cameco increased its water management system capabilities including underground pumping capacities. See Section 16.2.9 for more details. Cameco completed the associated environmental assessment process and started work on the Seru Bay project, which involves infrastructure to allow the release of treated water directly to Seru Bay of Waterbury Lake. See Sections 20.2 and 20.4 for more details.
- Cameco implemented both a comprehensive jet boring system (JBS) commissioning program as well as an operational implementation plan. The JBS commissioning program is targeted at assuring an effective startup and on-going operations. The operational implementation plan is focused on assuring that all of the key components necessary for startup are in place in order to assure a successful rampup and long-term sustainable operations. See Sections 16.3.5, 16.3.6 and 24.5, respectively, for more details.
- Cameco established the freeze wall for Shaft No. 2, activated the freeze system and resumed the sinking of Shaft No. 2, which resulted in the breakthrough to the 480 m level in early 2012. See Section 16.2.2 for more details.
- As of December 31, 2011, Cameco completed, as part of a surface freeze strategy, 41 freezeholes totalling 21,053 m and commenced freezing of the orebody and surrounding ground. See Sections 10.1 and 16.2.6 for more details.

- In 2010 and 2011, Cameco completed, as part of a Phase 1 surface drilling program, 58 delineation and geotechnical drillholes, for a total of 24,739 m. See Section 10.1 for more details.

1.2 Introduction

Cigar Lake is the world's second largest known high-grade uranium deposit and is located in northern Saskatchewan. McArthur River, which is also majority owned and operated by Cameco, is the largest known high-grade uranium deposit. The uranium grades of Cigar Lake's Mineral Reserves are over 100 times the world average for uranium deposits. Cigar Lake is owned by Cigar Lake joint venture partners:

- Cameco (50.025%);
- AREVA Resources Canada Inc. (AREVA) (37.1%);
- Idemitsu Canada Resources Ltd. (Idemitsu) (7.875%); and
- TEPCO Resources Inc. (TEPCO) (5.0%).

Cameco has proven expertise in operating uranium mines and mills in Saskatchewan and has been the operator of Cigar Lake since January 2002.

In December 2004, the Cigar Lake Joint Venture (CLJV) decided to proceed with development of the Cigar Lake mine and received a construction licence from the Canadian Nuclear Safety Commission (CNSC) that same month. Construction began on January 1, 2005. Development has been delayed due to two water inflow incidents that occurred in April and October 2006 and an additional water inflow incident in August 2008.

In October 2009, Cameco successfully sealed the August 2008 inflow and the underground workings were dewatered in February 2010. Safe access to the 480 m level, the main working level of the mine, was established and later to the 500 m level and work to inspect, assess and secure the underground development was completed. The restoration of underground mine systems and infrastructure in preparation for resumed construction activities was completed in 2011.

Development of the Cigar Lake mine is expected to be complete in 2013. Cameco plans to begin commissioning in ore in mid-2013, with the first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013. The mine and facilities have been designed to produce product for sale at a rate of approximately 18 million pounds U_3O_8 per year when the mine reaches full production.

Based on the confidence in its updated mine design and mining plan, successful mine remediation and construction performance (both underground and surface) to date and a positive economic analysis, Cameco plans to continue to proceed through construction to production as described in this technical report.

This technical report has been prepared for Cameco by, or under the supervision of, internal qualified persons in support of disclosure of new scientific and technical information in respect of the Cigar Lake project. This information is included in Cameco's annual Management's Discussion and Analysis for the year ended December 31, 2011, Cameco's Annual Information Form and 40-F for the year ended December 31, 2011 and Cameco's press release on February 9, 2012.

1.3 Property Tenure

The mineral property consists of one mineral lease ML-5521 (Mineral Lease or ML-5521) and 25 mineral claims, Nos. S-106540 to 106564 inclusive (Mineral Claims), totalling 93,048 ha. The Mineral Lease and Mineral Claims are contiguous. The Cigar Lake deposit is located in the area subject to the Mineral Lease, totalling 308 ha. The right to mine this uranium deposit was acquired under this Mineral Lease. The current Mineral Lease expires December 1, 2021 with the right to renew for successive ten-year terms absent a default by Cameco.

Surrounding the Cigar Lake deposit there are the 25 Mineral Claims, totalling 92,740 ha. A mineral claim grants the holder the right to explore for minerals within the claim lands and the right to apply for a mineral lease.

The surface facilities and mine shafts for the Cigar Lake project are located on lands owned by the Province of Saskatchewan. Cameco acquired the right to use and occupy the lands under a surface lease agreement with the Province. The most recent surface lease was signed to take effect in July 2011. The term of this surface lease expires in May 2044. The surface lease area has been increased for Cameco to implement its plans to discharge treated effluent directly to Seru Bay of Waterbury Lake. In addition, the area covering the Cigar Lake airstrip was amalgamated into this surface lease. The Cigar Lake surface lease covers a total area of 1,042 ha of Crown land.

1.4 Location and Site Description

The Cigar Lake mine site is located near Waterbury Lake, approximately 660 km north of Saskatoon. The McClean Lake JEB mill is located 69 km northeast of the mine site by road.

Access to the property is by an all-weather road and by air. All supplies to the site are transported by truck year round. Site activities are carried out throughout the year.

The topography and the environment are typical of the taiga forested lands common to the Athabasca Basin area of northern Saskatchewan. The area is covered with 30 to 50 m of overburden. The surface facilities are at an elevation of approximately 490 masl.

The site is connected to the provincial electricity grid with a 138kV overhead power line. There are standby generators in case of grid power interruption.

Personnel are recruited on a preferential basis: initially from the communities of northern Saskatchewan, followed by the province of Saskatchewan and then outside to other provinces. The development and construction work is tendered to a number of contractors.

1.5 Geology and Mineralization

The Cigar Lake deposit is located 40 km inside the margin of the eastern part of the Athabasca Basin. It is an unconformity related uranium deposit and occurs at the unconformity contact between rock of the Athabasca Group and underlying lower Proterozoic Wollaston Group metasedimentary rocks, an analogous setting to the Key Lake, McClean Lake, Collins Bay and McArthur River deposits. Cigar Lake shares many geological similarities with these deposits, including general structural setting, mineralogy, geochemistry, host rock association and the age of the mineralization.

The Cigar Lake deposit is distinguished from other similar deposits by its size, its high grade, the intensity of its alteration process, and the high degree of associated hydrothermal clay alteration. The Cigar Lake deposit is similar to the McArthur River deposit in that the sandstone overlies the basement rock and contains large volumes of water at significant pressure. However, unlike McArthur River, this deposit is flat lying.

The Cigar Lake deposit is approximately 1,950 m long, 20 to 100 m wide, and ranges up to 13.5 m thick, with an average thickness of about 5.4 m. It occurs at depths ranging between 410 and 450 m below the surface.

Three distinct styles of mineralization occur within the Cigar Lake deposit: high grade mineralization at the unconformity ("unconformity" mineralization) which includes the Mineral Resources and Mineral Reserves; fracture controlled, vein-like mineralization higher up in the sandstone ("perched" mineralization); and fracture controlled, vein-like mineralization in the basement rock mass.

The body of high grade mineralization located at the unconformity contains the bulk of the total uranium metal in the deposit and currently represents the only economically viable style of mineralization, considering the selected mining method and ground conditions. It is characterized by the occurrence of massive clays and high-grade uranium concentrations.

The unconformity mineralization consists primarily of three dominant rock and mineral facies occurring in varying proportions. These are quartz, clay (primarily chlorite with lesser illite) and metallic minerals (oxides, arsenides, sulphides). In the two higher grade eastern pods (Phase 1), the ore consists of approximately 50% clay matrix, 20% quartz and 30% metallic minerals, visually estimated by volume. In this area, the unconformity mineralization is overlain by a weakly mineralized contiguous clay cap one to five metres thick. In the lower grade western lens (Phase 2), the proportion changes to approximately 20% clay, 60% quartz and 20% metallic minerals.

1.6 Exploration of Cigar Lake Deposit

The Cigar Lake uranium deposit was discovered in 1981 on lands now covered by ML-5521 by a regional program of diamond drill testing of geophysical anomalies located by airborne and ground geophysical surveys. The deposit was subsequently delineated by a major surface drilling program from 1982 to 1986, followed by several small campaigns of drilling for geotechnical and infill holes to 2002 when the last surface hole prior to 2007 was drilled. An additional 186 holes were drilled from 2007 through 2011 for various geotechnical, geophysical, delineation and freezing programs.

In total, 178,255 m of diamond drilling has been completed in 406 surface holes to delineate the deposit. Of the 406 surface drillholes and wedged intersections drilled, 215 have been drilled within the geologically interpreted deposit limits. Note that a total of 66 of the 215 holes drilled within the deposit limits were not included in the current version of the Mineral Resource model. These excluded holes are from the Phase 2 delineation and Phase 1 surface freeze programs, where drilling is ongoing. The other 191 holes were drilled primarily for purposes of exploration and geotechnical assessment.

In addition to the surface holes, diamond drilling has been done from underground access locations primarily to ascertain rock mass characteristics in advance of development and mining, both in mineralized and waste rock. In the period from 1989 to 2011, 222 underground diamond drillholes totalling 19,561 m were drilled. Ten of these underground holes have intersected the deposit.

A total of 347 freeze and temperature monitoring holes have been drilled from underground workings to the end of 2006, of which approximately 182 have been gamma surveyed. The latter freezeholes were drilled by percussion methods so no core was available for assays. Conversion coefficients were developed in 2011 to convert radiometric probe results to e%U_3O_8 grades for the Cigar Lake deposit. This correlation was derived using the assay and downhole radiometric probe data from the 2010-2011 surface delineation drill program. This has allowed the 182 underground freezeholes, with only probing results available, to be incorporated into the database for geological interpretation of which 160 were sufficiently mineralized to be included in the Mineral Resource and Mineral Reserve model.

1.7 Mineral Resources and Mineral Reserves

The known mineralization at Cigar Lake is divided into two areas at mine easting 10405: the eastern area is denoted as Phase 1 and the western area is denoted as Phase 2. Delineation drilling of the deposit has been concentrated on Phase 1. The 2010-2011 surface delineation drill program successfully extended Phase 1 mineralization onto the Phase 2 side of the project. These additional Mineral Resources and Reserves are identified as Phase 2*, but have been estimated in precisely the same method as the Phase 1 Mineral Resources and Reserves. All of the Proven and Probable Mineral Reserves are within Phase 1/Phase 2*. Phase 1/Phase 2* also include minor amounts of Measured, Indicated, and Inferred Mineral Resources. Phase 2 has had less drilling and all resources in this area are in the Inferred Mineral Resource category. The known mineralization in Phase 1/Phase 2* is generally thicker and higher grade than that in Phase 2.

The Phase 1/Phase 2* Mineral Resource and Reserve estimate is based on 310 mineralized drillholes that defined the deposit of which 140 are from surface and 170 are from underground. The surface drillholes intersected the deposit at a nominal grid spacing of 25-50 m east-west by 20-25 m north-south. The Phase 2 Mineral Resource estimate is based on 53 drillholes, of which 19 intersected the mineralization, from surface at a nominal drillhole grid spacing of 200 m east-west by 20 m north-south.

A summary of the Mineral Resources in the Cigar Lake deposit with an effective date of December 31, 2011 is shown in *Table 1-1*. Alain G. Mainville, P.Geo., of Cameco, is the qualified person within the meaning of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) for the purpose of the Mineral Resource estimates.

Table 1-1: Summary of Mineral Resources – December 31, 2011

Category	Area	Total tonnes (x 1000)	Grade % U_3O_8	Total lbs U_3O_8 (millions)	Cameco's Share lbs U_3O_8 (millions)
		Measured and Indicated			
Measured	Phase 1	18.9	1.7	0.7	0.4
Indicated	Phase 1	21.4	2.9	1.4	0.7
Indicated	Phase 2*	4.0	1.8	0.2	0.1
Total Indicated		**25.5**	**2.7**	**1.5**	**0.8**
Total Measured and Indicated		**44.4**	**2.3**	**2.2**	**1.1**
		Inferred			
Inferred	Phase 1	125.3	1.9	5.4	2.7
Inferred	Phase 2*	5.8	6.5	0.8	0.4
Inferred	Phase 2	317.0	16.9	118.2	59.1
Total Inferred		**448.0**	**12.6**	**124.4**	**62.2**

Notes:
(1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of total Mineral Resources.
(3) Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.
(4) Phase 2* Mineral Resources are the extension of the Phase 1 Mineral Resources onto the Phase 2 area of the Cigar Lake project.
(5) Phase 1/Phase 2* Mineral Resources have been estimated with a minimum mineralization thickness of 1.0 m and by applying a cut-off grade of 1.0% U_3O_8. Phase 2 Mineral Resources have been estimated with a minimum mineralization thickness of 2.5 m, including 1.0 m of dilution, and by applying a cut-off grade of 5.9% U_3O_8 to the Mineral Resource block model.
(6) The geological model employed for Cigar Lake involves geological interpretations on section and plan derived from drillhole information.
(7) No allowance has been included for mining dilution or mining recovery for Phase 1/Phase 2* Mineral Resources. No mining recovery was applied to Phase 2 Mineral Resources.
(8) Mineral Resources were estimated based on the use of the jet boring mining method (JBS) combined with bulk freezing of the orebody.
(9) Mineral Resources were estimated using a 3-dimensional block model for Phase 1/Phase 2* and a 2-dimensional block model for Phase 2.
(10) No known metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues are expected to materially affect the above estimate of Mineral Resources.
(11) Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

A summary of the Mineral Reserves in the Cigar Lake deposit with an effective date of December 31, 2011 is shown in *Table 1-2*. Alain G. Mainville, P. Geo., C. Scott Bishop, P.Eng. and Eric Paulsen, P.Eng., Pr.Eng., each of Cameco are the qualified persons within the meaning of NI 43-101 for the purpose of the Mineral Reserve estimates.

Table 1-2: Summary of Mineral Reserves – December 31, 2011

Category	Area	Total tonnes (x 1000)	Grade % U_3O_8	Total lbs U_3O_8 (millions)	Cameco's Share lbs U_3O_8 (millions)
Proven	Phase 1	233.6	22.3	114.9	57.5
Probable	Phase 1	293.5	14.7	95.1	47.5
Probable	Phase 2*	10.1	30.7	6.8	3.4
Total Probable		**303.5**	**15.2**	**101.8**	**50.9**
Total Reserves		**537.1**	**18.3**	**216.7**	**108.4**

Notes:
(1) Total lbs U_3O_8 are those contained in Mineral Reserves and are before mill recovery of 98.5% has been applied. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of total Mineral Reserves.
(3) Phase 2* Mineral Reserves are the extension of the Phase 1 Mineral Reserves onto the Phase 2 area of the Cigar Lake project.
(4) Mineral Reserves have been estimated at a cut-off grade of 2.0% U_3O_8 and a minimum mineralization thickness of 1.5 m applied to the Mineral Resource block model, after estimating the diluted grade of the JBS cavity.
(5) The geological model employed for Cigar Lake involves geological interpretations on section and plan derived from drillhole information.
(6) Mineral Reserves have been estimated with an allowance of 0.5 m of dilution material above and below the planned cavity, plus approximately 11% external dilution at 0% U_3O_8.
(7) Mineral Reserves have been estimated based on 90% mining recovery.
(8) Mineral Reserves were estimated based on the use of the jet boring mining method combined with bulk freezing of the orebody. Jet boring produces an ore slurry with initial processing consisting of crushing and grinding underground, leaching and yellowcake production at the McClean Lake JEB mill. Mining rate assumed to vary between 100 and 140 t/d and a full mill production rate of approximately 18 million pounds U_3O_8 per year.
(9) Mineral Reserves were estimated using a 3-dimensional block model.
(10) An average uranium price of US$ 61/lb U_3O_8 with a US$1.00 = Cdn$1.10 fixed exchange rate was used to estimate the Mineral Reserves.
(11) No known metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues are expected to materially affect the above estimate of Mineral Reserves.

The updated Mineral Resource and Mineral Reserve estimates (December 31, 2011) reflect changes mainly due to:

- Re-interpretation of the mineralized envelopes of the Phase 1 area based on the results available at the time of the estimate from the 2010-2011 surface delineation drillhole program (49 new surface drillholes) including 3 drillholes that extended the Phase 1 mineralization into the Phase 2 area described as Phase 2* Mineral Resources and Mineral Reserves;
- Incorporation of data for 182 historic underground freezeholes proximal to the rampup area that were recently updated with converted radiometric data;

- Revised mine layout and dilution assumptions;
- Removal of sump underflow material from the Mineral Reserves;
- Reclassification of the Mineral Resources and Mineral Reserves;
- Updated operating cost estimates; and
- Metal price and exchange rate assumptions.

Phase 2 Mineral Resources have not been re-evaluated and show no change compared to the 2010 Technical Report. They are in the Inferred category. A surface drill program is in-progress to delineate the western portion of Phase 2 and the Mineral Resource model will be updated in 2012 upon completion of the program.

Following up on the recommendation from the 2010 Technical Report, the opportunity to eliminate the sump underflow material from the Mineral Reserves was assessed and changes were made to the mine design to remove this material from the mine without having to blend it with ore. The operating costs and capital expenditures have been adjusted to accommodate this change in process. In total, nearly 42,000 tonnes of material at 0% grade has been removed and has contributed to the overall grade increase of the Mineral Reserves estimate.

1.8 Mining

The jet boring mining system (JBS), a non-entry mining method, has been selected to mine the Cigar Lake deposit because of the challenges associated with mining the deposit including control of groundwater, weak rock formations, radiation protection, water inflow and relatively thin flat lying mineralization. This was selected after many years of exploration and test mining activities following the discovery of the deposit in 1981.

The JBS mining method consists of cutting cavities out of frozen ore, approximately 4.5 m in diameter, with a high pressure water jet producing approximately 230 t of ore for a typical 6.0 m ore thickness.

This method is new to the uranium mining industry and was developed and adapted specifically for the Cigar Lake deposit. One of the primary features of JBS mining is its non-entry approach, whereby personnel are not directly exposed to the orebody since all mining will be conducted from headings located in basement rock below it. The levels of radiation exposure to workers is kept low and below regulatory limits through the application of non-entry mining methods, the containment of the ore cuttings within cuttings collection systems, and via the application of ground freezing. Experience with non-entry mining of high grade uranium ore at Cameco’s McArthur River mine has demonstrated the effectiveness of a non-entry mining approach to manage radiation exposures.

Underground in-situ mining tests in 1992, comparing the JBS mining method to other methods, proved the potential of the method and provided the basis for the design and construction of a prototype jet boring system. A further series of in-situ mining field tests were then conducted in 1999 and 2000 and demonstrated the ability of the JBS to perform all production procedures in a timely and effective manner. Overall, the test mining programs were considered successful with the initial objectives achieved. An estimated total of 767 t of mineralized material grading on average 17.4% U_3O_8 was mined during the various mining tests. Although Cameco has successfully demonstrated the JBS mining method in trials, this method has not been proven at full production. As Cameco ramps up production, there may be some technical challenges, which could affect Cameco's production plans.

Mine development for construction and operation uses two basic approaches: drill and blast with conventional ground support and the mine development system (MDS). Use of a roadheader excavator is under evaluation for those areas of weak ground away from the orebody.

The MDS consists of a 5.1 m diameter full-face tunnel boring machine and the installation of a pre-cast concrete tunnel lining for ground support. One of the key features of the MDS is that it provides continuous temporary ground support during excavation and almost immediate installation of permanent ground support after excavation. This feature is critical for development in areas of poor ground conditions where there is minimal stand-up time.

With the exception of the MDS headings, the infrastructure excavations and the access drifts are being developed using conventional drill and blast mining methods. Geotechnical drilling and analysis of ground conditions is completed prior to confirming permanent infrastructure locations.

Cameco plans its mine development to take place away from known groundwater sources whenever possible. In addition, Cameco assesses all planned mine development for relative risk and applies extensive additional technical and operating controls for all higher risk development.

In 2011, Cameco identified some spalling and cracking of the tunnel segments in a short section of one of the crosscuts that was excavated in 1999. Cameco has taken steps to halt the deterioration and has reinforced the affected area. Cameco has retained two geotechnical consultants to provide advice on the need for any possible further tunnel reinforcement. Based on the recommendations of these consultants, some minor revisions may be required to modify the life-of-mine plan or segment design to ensure that the portion of the Mineral Reserves to be mined from this tunnel section are not negatively impacted, and that similar conditions will not arise elsewhere.

The main access to the mine is via Shaft No. 1, a 4.9 m diameter circular, concrete lined shaft which extends to a depth of 500 m and provides direct access to the working level on the 480 m level. The level number is the approximate depth of that level below surface in metres. Shaft No. 2 is a 6.1 m diameter circular, lined shaft which, as of early January 2012, had been sunk to a depth of 480 m with an ultimate planned depth of 500 m. This shaft is located 90 m south of Shaft No. 1 and provides access to the 480 m level. Shaft No. 1 will be used as the main access and services shaft, and as a route for delivery of fresh ventilation underground. Shaft No. 2 will be divided into two compartments by a central airtight partition: one compartment will serve as the main path for exhaust air from the mine; the second compartment will be used to downcast additional fresh ventilation air as well as provide secondary egress and a number of additional services. The primary ventilation system has been designed to supply a volume of up to 240 m^3/s of fresh air to the mine.

There are two main levels in the mine: the 480 and 500 m levels. Both levels are located in the basement rocks below the unconformity. Mining will be conducted from the 480 m level, which is located about 25 m below the ore zone. The main underground processing and infrastructure facilities are also located on this level. The 500 m level is accessed via a ramp from the 480 m level. The 500 m level provides for the main ventilation exhaust drift for the mine, the mine dewatering sump and additional processing facilities. Construction of these facilities is in progress.

Cameco plans to bulk freeze the ore zone and the surrounding ground prior to the commencement of mining in a given area. To accomplish this, Cameco plans to use a hybrid freezing strategy. Cameco will use surface freezing to support the rampup period and underground freezing for the longer-term development of the mine. This system freezes the deposit and underlying basement rock to between minus 10 ^{o}C and 20 ^{o}C in one to three years.

Freezing the ore zone and the surrounding ground in the area to be mined is key to the success of mining the deposit. This will result in several enhancements to the mining conditions. These enhancements include: (1) increasing the stability of the area being mined; (2) minimizing the risk of water inflows into the mine from the water bearing rock above the unconformity; and (3) reducing the radiation resulting from radon dissolved in the water.

Based on the results of the surface freeze test program completed in 2010, Cameco began to implement an innovative surface freeze strategy which involves freezing the orebody from the surface. The expected benefits to the project by implementing this strategy include:

- reducing the risk to the construction schedule in two ways:
    (1) the surface freeze process can start before developing the underground tunnels; and

(2) the construction activities underground are simplified by moving some of the related freezing activities and infrastructure to surface; and

- contributing positively to the overall project economics.

To the end of 2011, 41 surface freezeholes had been completed for this purpose. A packer will be installed at a depth of approximately 400 m in each surface hole designated for freezing to isolate the bottom portion of each hole. Freezeholes are then hooked up to the existing freeze plant and calcium chloride brine, at a temperature of minus 40 °C, is circulated in the bottom portion of each freezehole. Selected surface holes will be outfitted with a string of thermistors to monitor the progress of freezing.

For underground freezing, the first step in freezing is to drill near-vertical freezeholes from the 480 m freeze level up through the orebody. Calcium chloride brine at minus 40 °C is delivered underground through pipes installed in Shaft No. 1 from a surface refrigeration plant. This brine is received by heat exchangers underground which in turn cools the brine fed to the freeze pipes installed in the freezeholes.

The required mine production of 100 to 140 t/d of ore can be produced by jetting with two JBS mining units. The mine equipment fleet will be comprised of four JBS units and other equipment for mine development, drilling and other services. Ore mined by the JBS will mix with the cuttings water to form a slurry, which will be pumped through pipes directly from the JBS to the run-of-mine (ROM) ore receiving facility. From the ore receiving facility, the ore will be recovered and fed to an underground crushing and grinding circuit. The ground ore slurry is stored to be pumped to surface by a slurry pump through a pipeline to be installed in Shaft No. 2. At surface, the ore is stored, blended and partially dewatered for shipment in slurry form to the McClean Lake JEB mill for processing.

All mining with the JBS will be done from the 480 m production level, located in the basement rock below the ore zone. Following mining, each cavity will be backfilled with concrete. Cameco has agreed to purchase three additional JBS units and is procuring additional equipment for the jet boring mining system in 2012.

A mine water handling strategy has been developed that includes increasing the mine's water-handling capabilities for future routine and potential non-routine inflows above the existing capability previously assessed by Cameco in its 2004 environmental assessment. In addition to treating all routine water inflows (seepage and process water) prior to releasing to the environment, water from any non-routine inflow will also be treated prior to releasing to the environment until such time as the inflow can be mitigated at the source.

As of early 2012, Cameco has increased its installed mine dewatering capacity to 2,500 m^3/h. Mine water treatment capacity has been increased to 2,550 m^3/h and an environmental permit to discharge routine and non-routine treated water to Seru Bay is in process. As a result, Cameco believes it has pumping capacity of at least one and a half times the estimated maximum inflow. See Sections 1.10, 16.2.9 and 20.4 for more details.

The mine water treatment plant (WTP) has a capacity to treat and release mine effluent at a rate of 550 m^3/h. In the case of a mine water inflow exceeding this amount, a contingency water treatment system will be activated. This system is comprised of a 90,000 m^3 holding pond for water clarification and a 10,000 m^3 pond for surge capacity and two reagent addition buildings with capacities of 1,000 m^3/h each. The WTP currently releases treated mine effluent into the Aline Creek system, and will change over to discharging into Seru Bay once the facilities are constructed and a licence to operate the facility has been obtained.

As a result, Cameco believes it has sufficient pumping, water treatment and surface storage capacity to handle the estimated maximum inflow.

In 2011, in connection with a regulatory requirement, Cameco retained an independent engineering consultant to perform a technical review of the Cigar Lake mine design. The consultant found no significant exclusions or deficiencies in the material reviewed that would have negative impacts on the ground stability of the excavations or lead to an uncontrolled water inflow into the Cigar Lake mine.

A number of recommendations and suggestions for follow-up were included in the report provided by the consultant in the areas of geological interpretation, hydrogeological modelling, ground freezing, geotechnical data interpretation and ground stability assessment. Cameco has accepted the consultant's recommendations and has an action plan in place to address them in a timely manner.

1.9 Processing

Cigar Lake ore will be processed at two locations. Size reduction will be conducted underground at Cigar Lake, and leaching, purification and final yellowcake production and packaging will occur at McClean Lake JEB mill. The ore will be trucked in slurry form from Cigar Lake to the McClean Lake JEB mill in purpose-built containers identical to those used successfully to transport McArthur River ore slurry to the Key Lake mill.

The McClean Lake JEB mill is owned by the McClean Lake joint venture (MLJV) and operated by AREVA. The MLJV partners are:

- AREVA (70%);
- Denison Mines Inc. (22.5%); and

- Ourd (Canada) Co., Ltd. (7.5%).

The milling arrangements are subject to the terms and conditions of a toll milling agreement made effective January 1, 2002 between the CLJV and the MLJV (JEB Toll Milling Agreement). The CLJV partners, including Cameco, signed a binding memorandum of agreement effective November 30, 2011 (Memorandum of Agreement) with the MLJV to amend the milling arrangements, which will provide for all of the Cigar Lake ore to be milled at the McClean Lake JEB mill. The JEB Toll Milling Agreement will be amended to give effect to the new milling arrangement. The new toll milling arrangement is expected to result in a significant reduction in the operating costs of the Cigar Lake project.

With the signing of the Memorandum of Agreement, the McClean Lake JEB mill is being expanded to process and package all of Cigar Lake's current Mineral Reserves. Currently, the McClean Lake JEB mill has a production capacity of 12 Mlbs U_3O_8 per year. In order to process all of Cigar Lake's current Mineral Reserves and other ores at McClean Lake, the total production capacity at the McClean Lake JEB mill will be increased to 22 Mlbs U_3O_8 per year. Construction of the expanded facility is scheduled to begin in 2012 and be completed in 2015. Mill operation will continue during the construction stages in order to meet the Cigar Lake production schedule.

The total estimated annual production will be approximately 18 million pounds of U_3O_8 per year when the mine is in full production and the MLJV has agreed to dedicate the necessary mill capacity at the McClean Lake JEB mill for this production.

During processing at McClean Lake JEB mill, ore tailings will be generated. The residue will be treated in the upgraded McClean Lake mill tailings neutralisation area. Neutralised tailings will be pumped to the existing JEB tailings management facility (TMF). Subject to a capped contribution from the CLJV of $4.6 million, the MLJV will be responsible for all capital costs required to optimize the TMF to ensure that the TMF can receive and accommodate tailings from processing all of the current Cigar Lake Mineral Reserves. This optimization work is expected to be completed in 2013. The MLJV is responsible for all costs of decommissioning the McClean Lake JEB mill. See Sections 20.3 and 20.5 for a discussion of the TMF and licensing of the TMF and Section 19.2.1 for a discussion of the JEB Toll Milling Agreement and the Memorandum of Agreement.

1.10 Environmental Assessment and Licensing

The Cigar Lake project has regulatory obligations to both the federal and provincial governments. Classified as a nuclear facility, primary regulatory authority resides with the federal government and its agency, the CNSC. The main regulatory agencies that issue permits / approvals and inspect the Cigar Lake project are: the CNSC (federal), Fisheries and Oceans Canada (federal), Environment Canada (federal), Transport Canada (federal), Saskatchewan Ministry of Labour Relations and Workplace Safety (provincial), and Saskatchewan Ministry of Environment (provincial).

One of the initial steps in the regulatory process was to assess the project under the federal and provincial environmental assessment (EA) processes.

In 1995, the Cigar Lake project, Environmental Impact Statement (the “1995 EIS”) was submitted to the Joint Federal-Provincial review panel on Uranium Mining Developments in Northern Saskatchewan (the “Panel”). In 1997, the Panel recommended that pending identification of a suitable waste rock disposal location, the project should proceed. The Canadian and Saskatchewan governments both accepted the Panel’s recommendation and in 1998 both government bodies approved the project in principle.

In January 2003, the CNSC informed Cameco that due to a perceived uncertainty regarding the use of the transitional provisions of *Canadian Environmental Assessment Act* (CEAA), the CNSC would require a new environmental assessment of the Cigar Lake mine portion of the project to support construction and operating licence decisions.

In February 2004, Cameco submitted an environmental assessment study report (2004 EASR) for the Cigar Lake mine portion of the project under CEAA to meet the above requirement. The 2004 EASR assessed the potential effects from the construction, operation and decommissioning of the Cigar Lake mine. The 2004 EASR did not reassess the transportation of the ore to the McClean Lake JEB mill; milling of the ore; or the management of tailings. The 2004 EASR was accepted by the CNSC as meeting the requirements of CEAA and therefore the licensing/permitting processes for the Cigar Lake project could proceed.

In 2004, Cameco applied for a licence to construct the Cigar Lake mine site in two parts:

(1) construction of the Shaft No. 2 surface complex and the freeze plant; and

(2) construction of all other mining and support facilities at the Cigar Lake mine site.

In July 2004, the CNSC approved the construction of the Shaft No. 2 surface complex and the freeze plant and issued the construction licence in December 2004. In December 2007, the CNSC amended the construction licence to extend its term for two years from January 1, 2008 until December 31, 2009, so that actions resulting from the 2006 inflow event could be addressed, and mine remediation could proceed. The licence was subsequently amended again in June 2008 to enable Cameco to proceed with certain activities associated with mine dewatering, mine entry, and securing/assessing the underground workings. In August 2008, during dewatering, a new water inflow source developed, leading to the decision to suspend dewatering to ensure the cause of the inflow was understood and that appropriate measures to mitigate the inflow could be taken.

In 2009, after sealing the new inflow source, Cameco re-initiated dewatering of the main shaft. In addition, the CNSC licence was extended to December 31, 2013 allowing for completion of the mine construction project. Additional regulatory approvals for certain licence activities, such as the mine plan and establishment of Shaft No. 2 as a second means of egress, were obtained in 2011 and early January 2012, respectively, allowing for remediation and resumption of pre-flood underground construction and development.

As a result of the October 2006 and August 2008 water inflow incidents, Cameco reviewed the emergency mine dewatering strategy. It was determined that one of the safest ways to mitigate the impact of potential future mine inflows is to increase the mine's dewatering capacity. Doing so requires an enhancement to the mine's ability to treat and release treated effluent to the environment. Cameco therefore re-evaluated options to address potential mine effluent discharge restrictions in the event of any future inflow scenarios. Specifically the risk of erosion in the Aline Creek system was evaluated. Consequently, Cameco applied to federal and provincial regulatory authorities to move the discharge point directly into Seru Bay of Waterbury Lake. This is where the Aline Creek system currently enters Waterbury Lake. This application triggered under CEAA a screening level environmental assessment, which was accepted in 2011 after which approval to proceed with construction was received. Interim approvals and measures are in place to support increased environmental discharges of up to 1,100 m^3/h to the Aline Creek system if the need were to arise prior to receiving approval for the Seru Bay discharge point being operational. As well, under the provincial operating approval, specific approvals to construct and/or operate relevant components of the surface infrastructure will be required.

An amendment to the McClean Lake JEB mill's Licence to Operate is still required in order to process the ore from the Cigar Lake mine at the McClean Lake JEB mill. No issues surrounding this licence amendment approval are anticipated. AREVA has received regulatory approval to proceed with the work for optimization of the TMF necessary to receive all of the tailings from processing all of Cigar Lake's current Mineral Reserves. This work is anticipated to be completed in 2013.

Concurrent with the mine construction, which is being completed under a construction licence that expires at the end of 2013, an operating licence application will be prepared for submission to the CNSC. Any construction activities that might remain would be covered by the new operating licence.

1.11 Cigar Lake Water Inflow Incidents and Remediation

Over the period, 2006 through 2008, the project suffered several setbacks as a result of three water inflow incidents.

The first occurred in April of 2006 resulting in the flooding of the then partially completed Shaft No. 2. The two subsequent incidents involved inflows in the mine workings connected to Shaft No. 1 and resulted in flooding of the mine workings completed to that point in time.

Cameco developed and successfully executed recovery and remediation plans for both the Shaft No. 2 inflow and the 2 inflows experienced in Shaft No. 1 workings. This culminated in the resumption of sinking of Shaft No. 2 in the first half of 2011, the successful break through to the 480 m level of the main mine workings in early 2012 and the commencement and completion of underground remediation and restoration of the Shaft No. 1 workings in 2010 and 2011.

The detailed phased remediation plan and its associated activities were described in the 2007 Technical Report and updated in the 2010 Technical Report.

Through 2010 and 2011, Cameco developed a comprehensive plan and successfully proceeded with remediation to restore the underground workings at Cigar Lake. This involved inspecting the mine and completing any additional remedial work to protect it from an inflow or significant ground failure (for example, determining if additional reinforcement was required in higher risk areas). The work to secure the mine was completed in 2011.

With successful re-entry to main mine working achieved in early 2010 a comprehensive underground rehabilitation program was implemented through the period since the 2010 Technical Report. The program involved rehabilitating the remaining lower risk areas of the mine (including the 480 and 500 m levels) and re-establishing the full mine ventilation circuit. Some of the specific tasks included:

- re-establishing the permanent refuge stations and communications;
- installation of the emergency backup pumping capacity;
- re-establishing the orebody freezing program;
- commencing the Shaft No. 2 freezing program;
- preparing areas to resume construction/development activities; and
- replacing electrical components and equipment damaged due to flooding.

As part of securing the mine and underground rehabilitation program, detailed assessments of the underground conditions were completed which provided further input to the overall Cigar Lake design and strategy, allowing the mine plan to be further optimized.

With the mine fully secured, the underground rehabilitation program complete and regulatory requirements met, Cameco resumed underground construction activities in 2011 that had been interrupted by the October 2006 water inflow.

Cameco completed the dewatering of Shaft No. 2 in April 2009 and remediation was completed in May 2009. The freezing infrastructure to support the completion of shaft sinking was completed in early 2011 and the freeze system activated. Shaft sinking resumed in the first half of 2011 and by early 2012, Cameco had achieved breakthrough to the 480 m level and sinking to completion (the 500 m level) continues. The breakthrough to the 480 m level provided for a second means of egress for the mine and for future increases in ventilation.

In 2011, a hydrostatic liner was installed in the shaft from the 368 m depth to the 480 m level, where it will transition back to a non-hydrostatic liner.

Cameco plans to complete Shaft No. 2 by the second quarter of 2013, taking the following steps:

- sinking the shaft from the current shaft bottom depth of 480 m to its final depth of 500 m – to be completed in 2012;
- establishing a shaft station at the 480 m level;
- installing shaft furnishings including construction of a concrete ventilation partition, installation of electrical cable, water services, ore slurry pipes and permanent service cage facilities; and
- commissioning of the shaft systems.

1.12 Current Status of Development

Underground development required for the start of production is estimated to be 70% complete, based on required infrastructure changes identified in the updated mine plan. Partially completed facilities include Shaft No. 2, underground development and freezehole drilling. Remaining underground work to be completed includes Shaft No. 2, brine system freezing infrastructure and ore freezing program, underground ore extraction system, ore processing circuit including changes due to the new mine plan, and mine development.

A substantial number of surface facilities have been completed. Surface construction is 56% complete at Cigar Lake. The remaining important surface construction includes:

- new administration/services building;
- Seru Bay pipeline;
- completion of the surface ore process facilities and the new propane tank farm; and

- expansion of the 138 kV electrical substation and permanent employee residence.

The McClean Lake JEB mill is being expanded to process and package all of Cigar Lake ore. Construction of the expanded facility is scheduled to begin in 2012 and be completed in 2015. Mill operation will continue during the construction stages in order to meet the Cigar Lake production schedule.

1.13 Production Plan

The mine life based on current Mineral Reserves will be approximately 15 years with an estimated full annual production of 18 million pounds of U_3O_8 recovered from the mill. Cigar Lake will produce less than the full annual production in the early and late years of the planned mine life.

The following is a general summary of the Cigar Lake production schedule based on current Mineral Reserves:

- Total mill production of 213.5 million pounds U_3O_8, based on an overall milling recovery of 98.5%.
- Total mine production of 537 thousand t of ore.
- Average mill feed grade of 18.3% U_3O_8.
- Mine operating life of approximately 15 years.
- Commissioning in ore is planned to begin in mid-2013, with the first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013.
- Mining rate is variable to achieve a constant production level of U_3O_8. The average mine production varies annually from 100 to 140 t/d during peak production depending on the grade of ore being mined.
- Cameco expects to ramp up to the full production rate by the end of 2017. Full annual production of 18 million pounds of U_3O_8 is expected to be achieved in 2018.

The mine and mill production schedules for the Cigar Lake project are shown in *Figures 1-1* and *1-2*, respectively.

The Cigar Lake production schedule relies upon the ground being sufficiently frozen prior to the start of JBS mining. As part of the mining plan, the orebody has been divided into production panels, with one JBS unit operating in any panel. At least four production panels need to be frozen at any point in time to achieve the full annual production of 18 million pounds of U_3O_8.

Figure 1-1: Mine Production

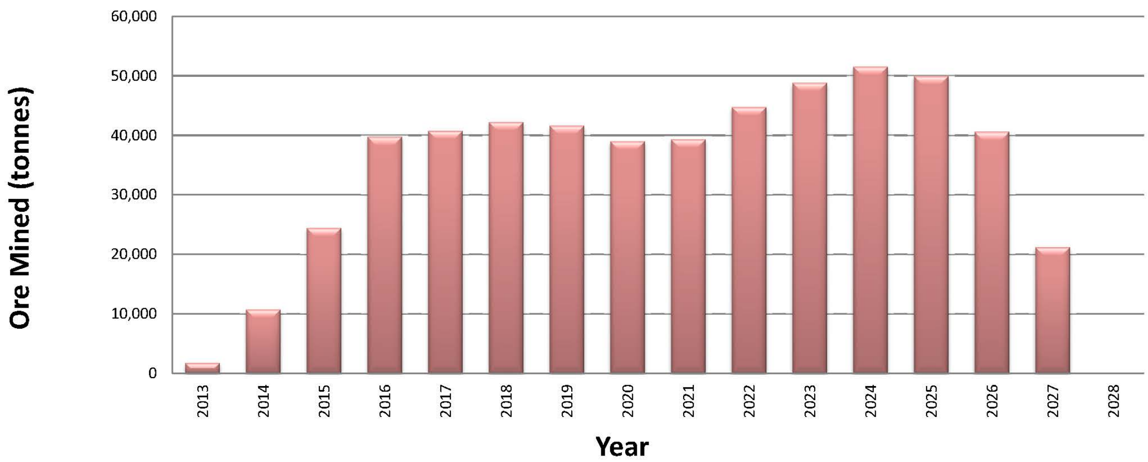
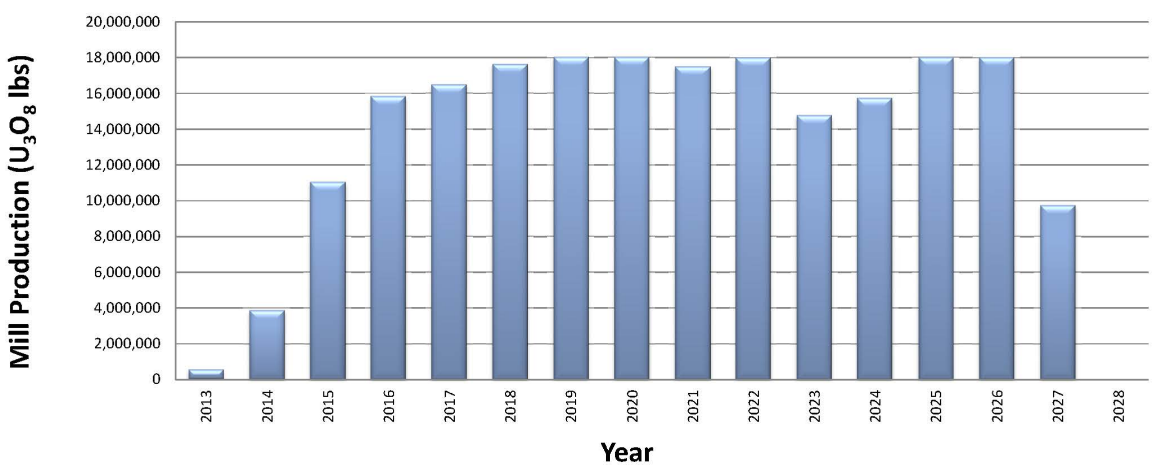


Figure 1-2: Mill Production



1.14 Economic Analysis

The economic analysis is based on Cameco's share (50.025%) of the Mineral Reserves for the Cigar Lake project. The financial projections do not contain any estimates relating to the potential mining and milling of Mineral Resources. Only Mineral Reserves have demonstrated economic viability. Accordingly, expenditures required to bring any of the Mineral Resources into production or to identify additional Mineral Reserves and Mineral Resources, have not been included.

The remaining capital costs, as of December 31, 2011, for the Cigar Lake project are estimated to be $857.3 million, including $701.4 million to complete underground development, underground construction and surface construction at Cigar Lake and $155.9 million to complete the mill modifications at McClean Lake. Standby costs at the McClean Lake JEB mill are expected to be $106.6 million, for a total remaining cost of $963.9 million for the Cigar Lake project. The sustaining capital expenditures are projected to be $377.0 million that the CLJV will be required to fund throughout the operating life of the Cigar Lake mine. The cost estimates in this paragraph are on a 100% basis.

Cameco's share of the remaining capital and other costs to complete the Cigar Lake project are $483.6 million, including $428.9 million of capital cost and $54.7 million of standby costs. Including the $675.3 million spent by Cameco on construction costs and mill modification costs prior to December 31, 2011, Cameco's share of the aggregate capital cost is now estimated to be $1.1 billion ($192 million over the 2010 Technical Report). In addition, Cameco's share of the projected sustaining capital expenditures is $188.6 million.

Under the terms of the JEB Toll Milling Agreement, the CLJV partners are responsible for the payment of standby costs to the MLJV under certain conditions. AREVA shut down the McClean Lake JEB mill in July 2010, at which time, the CLJV began paying the standby costs. These costs are expected to continue until production startup in 2013. The total expected cost of standby costs to be paid by the CLJV partners is $174.6 million. Cameco's share is $89.6 million, which will be expensed as incurred.

Cameco's share of the aggregate remediation cost at Cigar Lake which was spent and expensed beginning in 2006 is estimated to be $86.4 million. Cameco has expensed its share of the remediation costs as they were incurred. More specifically, the costs that were expensed related to contractor costs that were directly engaged in, or provided support to, the remediation efforts, and any cancellation or retention costs that were required as a result of the water inflow. As of December 31, 2011, remediation activities are complete.

The CLJV's aggregate capital cost for Cigar Lake construction, including construction costs prior to December 31, 2011 of $1.3 billion, is estimated to be approximately $2.2 billion. Total remediation costs for the CLJV are in addition to the capital cost and are estimated at $182.2 million. Standby costs will add an additional $174.6 million to the total costs. The combined capital and other costs for the Cigar Lake project are now estimated to be approximately $2.6 billion for the CLJV. The cost estimates in this paragraph are on a 100% basis.

Average operating costs over the mine life, excluding royalties, are estimated to average $18.57/lb U_3O_8 over the life of the Cigar Lake project. The 2010 Technical Report showed expected average operating costs of $23.14/lb U_3O_8 over the life of the Cigar Lake project. The decrease in operating costs is primarily due to the agreement to mill all of the Cigar Lake Mineral Reserves at the McClean Lake JEB mill.

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, for net cash flows as at January 1, 2012 forward, of $1.4 billion for its share of the Cigar Lake Mineral Reserves. The pre-tax IRR, also calculated from January 1, 2012, is estimated to be 32.8%.

Payback for the Cigar Lake project can be considered on many different factors:

- Payback for Cameco, excluding all 2011 and prior costs as sunk costs, would be achieved during 2017 on an undiscounted, pre-tax basis.
- If the $1.6 billion, including remediation costs, spent on Cigar Lake construction prior to 2012, (Cameco share equal to $796 million) were included in the calculation, Cameco would achieve payback during 2019 on an undiscounted, pre-tax basis.

1.15 Project Risks

Cigar Lake is a challenging deposit to develop and mine. These challenges include control of ground water, weak rock formations, radiation protection, water inflow, mining method uncertainty, relatively thin flat lying mineralization and other mining-related challenges. The sandstone overlying the basement rock contains large volumes of water at significant pressure. Cameco is undertaking a number of initiatives to mitigate the project risks associated with mining the Cigar Lake deposit and to mine the deposit in a safe and economic manner including, but not limited to, using the jet boring mining method, freezing of the orebody and the surrounding ground, lowering the production horizon and increasing mine dewatering capacity. Cameco applies its operational experiences and the lessons it has learned about water inflows at McArthur River and Cigar Lake to reduce risk.

Specific project risks are described in more detail in Section 24.6. The construction schedule, the plan to begin commissioning of ore in mid-2013, with first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013 and cost estimates assume that project risks will be able to be successfully mitigated. Cameco believes that this will occur.

1.16 Conclusions and Recommendations

The Cigar Lake project outlined in this report represents significant economic sources of feed material for the McClean Lake JEB mill. With an estimated operating mine life of 15 years, Cigar Lake is expected to produce an estimated 213 million pounds of U_3O_8. At the forecast average realized uranium price over this 15 year period, it is estimated that Cameco will receive substantial positive net cash flows from its share of Cigar Lake production.

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, for net cash flows January 1, 2012 forward, of $1.4 billion for its share of the Cigar Lake Mineral Reserves. The pre-tax IRR, also calculated from January 1, 2012, is estimated to be 32.8%. A sensitivity analysis of the Cigar Lake project economics demonstrates that the project generates positive cash flows in various scenarios, including assumptions of higher costs, lower revenues, or lower ore grades.

The aggregate capital and other cost for construction spent by the CLJV, including costs prior to December 31, 2011 of $1.6 billion, is estimated to be approximately $2.6 billion, an increase of $523.9 million over the cost estimate disclosed in the 2010 Technical Report. The cost increase is primarily the result of the implementation of the surface freeze strategy, general cost escalation, cost to upgrade and expand the McClean Lake mill and improvements to the mine plan. Despite these increases to the project cost, the economics for the project remain positive.

Cameco's share of the remaining capital and other costs to complete the Cigar Lake project is $483.6 million, including $428.9 million of capital costs and $54.7 million of standby costs. Including the $675.3 million spent by Cameco on construction costs and mill modification costs prior to December 31, 2011, Cameco's share of the aggregate capital cost is now estimated to be $1.1 billion ($192 million over the 2010 Technical Report). In addition, Cameco's share of the projected sustaining capital expenditures is $188.6 million.

The Cigar Lake project shows relatively low sensitivity to changes in its operating or capital cost projections. The relative sensitivity to changes in uranium price and ore grade realized is significantly higher due in part to the relatively high-grade nature of the deposit and the price estimates being used, which are a reflection of the current U_3O_8 market environment.

Based on its confidence in the updated mine design and mining plan, successful mine remediation and construction performance (both underground and surface) to date and a positive economic analysis, Cameco plans to continue to proceed through construction to production, as described in this technical report.

The development and construction of the project has been interrupted by two major water inflow incidents in 2006 and one major water inflow in 2008 that resulted in the flooding of the partially completed Shaft No. 2 and the underground workings. These incidents stopped all underground excavation and construction activities. Despite these setbacks, Cameco moved forward and developed and successfully implemented a remediation plan to allow the resumption of pre-inflow activities at the mine. Work is proceeding across all fronts to begin commissioning in ore in mid-2013.

Cameco revised its mine plan building on the lessons learned through the successful inflow remediation, geotechnical, geological, hydrogeological assessments, experience gained from the inspection of the underground workings after successful mine re-entry and learnings from other Cameco operations. These changes to the mine plan include expanded ground freezing, the introduction of both surface and underground freezing in a hybrid approach and the backfilling of the 420 m level and the 465 m level, amongst many improvements in design and strategy. The installed pumping capacity has been expanded, and expansions in water treatment and surface storage capacity provide for an enhanced water management system. In addition, Cameco has implemented enhanced procedural controls and technical risk assessments for mine development and demonstrated their successful application in the underground development completed to date. These and other actions are expected to reduce the risk of any future inflows. Cameco is also employing a strategy of bulk freezing the ore zone prior to the commencement of production mining in a given area.

The revised mine plan, the successfully implemented remediation program and the comprehensive construction and operational startup plans are anticipated to maintain the original objectives of the Cigar Lake project, to achieve:

- a positive economic outcome;
- a planned annual production rate of approximately 18 million pounds of U_3O_8; and
- over 200 million pounds of production.

Many aspects of the Cigar Lake project are based on the designs that have been proven and are being successfully used at the McArthur River mine. One of the challenges of mining the Cigar Lake deposit is radiation control due to its high grade. Cameco has been producing ore with similar high grades from the McArthur River mine since 1999. The experience from McArthur River has been used extensively in the design of the Cigar Lake project. These designs include remote mining for radiation protection, freezing for control of radon gas and water inflows, underground grinding of the ore and hydraulic hoisting to surface. The incorporation at Cigar Lake of these designs and practices proven to be successful at the McArthur River mine significantly reduces the risk in numerous aspects of the Cigar Lake project.

Cameco successfully tested and has implemented an innovative surface freeze strategy to further assure successful startup and production. Cameco intends on using this approach to the freezing of initial ore mining panels.

In connection with a regulatory requirement, Cameco retained an independent engineering consultant to perform a technical review of the Cigar Lake mine design. A number of recommendations and suggestions for follow-up were included in the report provided by the consultants in the areas of geological interpretation, hydrogeological modelling, ground freezing, geotechnical data interpretation and ground stability assessment. Cameco has implemented an action plan to address such recommendations and suggestions in a timely manner.

The JBS mining method is new to the uranium mining industry and was developed and adapted specifically for the Cigar Lake deposit. The jet boring mining method planned for Cigar Lake has been successfully tested with prototype equipment and the mining plan has been engineered to suit this method. Although Cameco has successfully demonstrated the JBS mining method in trials, this method has not been proven at full production. Test mining trials have been completed on a limited number of cavities that may not be representative of the deposit as a whole. As Cameco ramps up production, there may be some technical challenges, which could affect Cameco's production plans, including, but not limited to variable or unanticipated ground conditions, ground movement and cave ins, water inflows and variable dilution, recovery values and mining productivity. Even though enhancements have been made to the design of the JBS unit, there is a risk that the rampup to full production rate may not be achieved on a sustained and consistent basis.

Despite the risks associated with this new mining method, Cameco continues to believe that the choice of the JBS mining method is prudent and practical. Cameco is confident that it will be able to solve challenges that may arise, but a failure to do so would have a significant impact on Cameco's business. Cameco has in place a comprehensive operational implementation program including an intensive focus on the implementation of the JBS mining system. This includes the training of personnel prior to startup of operations, surface and underground testing, and reliability planning and implementation to assure as effective and efficient a startup as possible.

Cameco is ensuring that systems, tools and personnel resources are enhanced and assessed for sufficiency, on a periodic basis, to assure the successful delivery of the project from engineering through field execution. Cameco continues to seek opportunities to integrate learnings from the project and its other operating divisions to assure a successful project.

Cameco plans to continue to systematically collect density samples from current and future core drilling programs to add samples to the current density database. The additional samples will be used to further improve the density estimation formulas for Mineral Resource estimation.

Metallurgical test work has been used to design the McClean Lake JEB mill circuits relevant to Cigar Lake ore and associated modifications. Samples used for metallurgical test work may not be representative of the deposit as a whole. It is recommended that an ongoing sampling and metallurgical test work campaign be implemented to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation.

A drill program was proposed and initiated in 2011 for the western portion of the Phase 2 area with the goal of confirming the quantity of Mineral Resources as well as the potential to upgrade the category of such Mineral Resources. Following the completion of the current surface drill program (early-2012), Cameco plans to create a 3-dimensional block model for the Phase 2 area that will incorporate the latest geological interpretation and up-to-date structural information. This model will be used to update the Mineral Resource estimate and provide a basis for a scoping study to assess possible development options.

Additional drilling from surface or underground will be required to upgrade the Phase 1 Inferred Resources. No surface delineation drilling over Phase 1 is planned at this time. Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources at Cigar Lake will ever be upgraded to a higher category.

In order to execute the Cigar Lake project plans while mitigating risks, the proposed expenditures set out in Tables 21-1, 21-2 and 21-3 of this report are necessary and endorsed by the authors of this technical report.

The authors of this technical report concur with, and recommend that Cameco proceed with, the foregoing plans.

2 INTRODUCTION

2.1 Introduction and Purpose

This technical report has been prepared for Cameco, by, or under the supervision of, internal qualified persons in support of disclosure of new scientific and technical information in respect of the Cigar Lake project as contained in Cameco's annual Management's Discussion and Analysis for the year ended December 31, 2011, Cameco's Annual Information Form and 40-F for the year ended December 31, 2011 and Cameco's press release dated February 9, 2012. This new information is the result of progress on the project combined with experience gained since the 2010 Technical Report for the project, the decision to proceed with the surface freeze strategy, additional surface drilling to delineate the Cigar Lake deposit and the agreement to mill all Cigar Lake Mineral Reserves at the McLean Lake JEB mill.

This report has been prepared in accordance with NI 43-101 by, or under the supervision of the following qualified persons:

- C. Scott Bishop, P. Eng., Principal Mine Engineer, Cameco Technology and Innovation, Cameco Corporation;
- Grant J. H. Goddard, P. Eng, Vice-President, Saskatchewan Mining North, Cameco Corporation;
- Alain G. Mainville, P. Geo, Director, Mineral Resources Management, Cameco Corporation; and
- Eric Paulsen, P. Eng., Pr. Eng., Interim Chief Metallurgist, Cameco Technology and Innovation, Cameco Corporation.

These individuals are the qualified persons responsible for the content of this report. All four qualified persons have visited the Cigar Lake site.

Mr. Bishop from October 2004 to September 2010 was the Chief Mine Engineer of the Cigar Lake project and was present at the site generally at least several times a month for periods extending up to seven days. Mr. Bishop's last personal inspection of the Cigar Lake project occurred on November 24, 2011, for a period of one day.

Mr. Goddard from October 2007 to November 2010 was the General Manager of the Cigar Lake project and was present at the site generally weekly for periods extending up to four days. Mr. Goddard's last personal inspection of the Cigar Lake project occurred on January 31, 2012, for a period of one day.

Mr. Mainville has been involved with the Cigar Lake project since 2000 and has visited the site on four occasions. Mr. Mainville's last personal inspections of the project geological data management, core logging, sampling procedures and surface drilling activities occurred in March and August, 2011 for a period of three days.

Mr. Paulsen has been involved with the Cigar Lake project since 2010 and has visited the site on two occasions. Mr. Paulsen's last personal inspection of the Cigar Lake surface processing facilities occurred in October 2011, for a period of one day. From September 2007 to May 2009, Mr. Paulsen was employed as a Mill Metallurgist at the McClean Lake JEB mill and from May 2009 to May 2010, was employed as a Process Engineer for the McClean Lake JEB mill.

2.2 Report Basis

This report has been prepared with available internal Cameco data and information and data and information prepared for the CLJV. Technical and certain financial information for processing Cigar Lake ore at the McClean Lake JEB mill was provided to Cameco by AREVA.

The principal technical documents and files relating to the Cigar Lake deposit that were used in preparation of this report are listed in Section 27.

All monetary references in this technical report are expressed in Canadian dollars, unless otherwise indicated. Cost estimates in this technical report reflect costs since 2004.

Figures within this technical report use three different coordinate systems: latitudes/longitudes, Universal Transverse Mercator (UTM) coordinates and mine grid. The UTM coordinates are calculated using the latest World Geodetic System (WGS) standard WGS 84. The conversion from mine grid to UTM coordinates is provided below.

UTM Northing = Mine Northing + 6426473.5

UTM Easting = Mine Easting + 516549.1

3 RELIANCE ON OTHER EXPERTS

The authors have relied, and believe they have a reasonable basis to rely, upon the following individuals who have contributed the environmental, legal, marketing and taxation information stated in this report, as noted below:

Jean Alonso, P. Eng, Director, Safety Health Environment and Quality (SHEQ) – Compliance and Licensing, Cameco Corporation, Sections 1.10 (a description of environmental assessment and licensing), 4.5 (a description of known environmental liabilities), 4.6 (a description of permitting) and 20 (a description of environmental studies, permitting and social or community impact).

Larry Korchinski, LLB, Director, Legal Services and Assistant General Counsel, Cameco Corporation, Sections 4.2 (a description of mineral tenure), 6.1 (a description of joint venture agreements and interests), 19.2 (an overview of material contracts for property development), 19.2.1 (a description of the JEB Toll Milling Agreement and Memorandum of Agreement) and 19.2.2 (a description of the agreement to manufacture and supply JBS units).

Penny Buye, Director, Market Planning and Analysis, Cameco Corporation, Section 19.1 (a description of uranium markets) and 19.2.3 (a description of uranium sales contracts).

Randy Belosowsky, CA., Director, Special Projects - Tax, Cameco Corporation, Sections 22.5 and 22.6 (a description of taxes and royalties).

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Cigar Lake mine site is located near Waterbury Lake, approximately 660 km north of Saskatoon, at latitude 58^0 04' 14" north and longitude 104^0 32' 18" west, and about 40 km inside the eastern margin of the Athabasca Basin Region in northern Saskatchewan. See *Figure 4-1*.

The mine site is in close proximity to two uranium milling operations. McClean Lake is 69 km northeast by road and Rabbit Lake is 87 km east by road. The McArthur River mine is 46 km southwest by air from the mine site.

Figure 4-1: Cigar Lake Mineral Property, Project Location

Source: Cameco

4.2 Mineral Tenure

The mineral property consists of one mineral lease ML-5521 (Mineral Lease or ML-5521) and 25 mineral claims Nos. S-106540 to 106564 inclusive (Mineral Claims), totalling 93,048 ha. The Mineral Lease and Mineral Claims are contiguous.

The Cigar Lake deposit is located in the area subject to the Mineral Lease, totalling 308 ha. The right to mine this uranium deposit was acquired by Cameco under this Mineral Lease, as renewed, effective December 1, 2001 from the Province of Saskatchewan. This Mineral Lease is granted by the Province of Saskatchewan under The Crown Minerals Act (Saskatchewan). Under the Mineral Disposition Regulations, 1986 (Saskatchewan), issued under this act, the term of ML-5521 is for 10 years and expires on December 1, 2021, subject to a right to renew for successive ten-year terms absent a default by Cameco. The Province of Saskatchewan may only terminate ML-5521 if Cameco breaches a provision of the lease or fails to satisfy any of its obligations under The Crown Minerals Act (Saskatchewan) or associated regulations, or in the event that any prescribed environmental concerns arise.

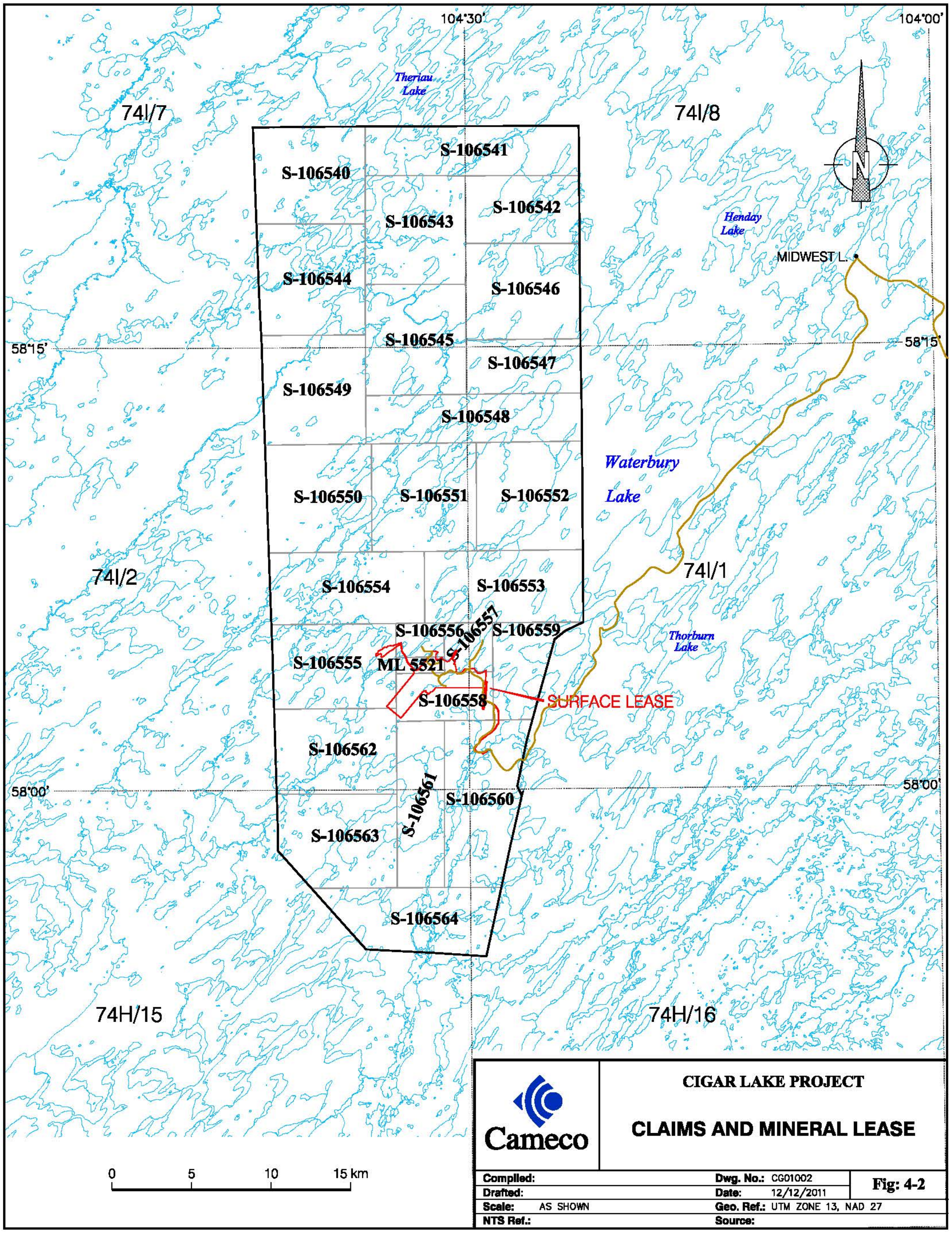
Surrounding the Cigar Lake deposit, there are 25 Mineral Claims which were also granted by the Province of Saskatchewan under The Crown Minerals Act (Saskatchewan) totalling 92,740 ha. These Mineral Claims grant the holder the right to explore for minerals within the claim lands. A holder of a mineral claim in good standing has the right to convert the mineral claim into a mineral lease. Surface exploration work of a mineral claim requires additional government approval.

There is an annual requirement of $2.3M either in work or cash to retain title to ML-5521 and the 25 Mineral Claims. Based on previous work submitted and approved by the Province of Saskatchewan, title is secured until 2023.

Under the Cigar Lake Joint Venture Agreement and related agreements, made effective January 1, 2002, the Mineral Lease and the 25 Mineral Claims noted above were divided into the Cigar Lake lands, consisting of ML-5521 and claim S-106558, and the Waterbury Lake lands, consisting of the remaining 24 claims. AREVA is the operator of the Waterbury Lake lands and is also contract exploration operator of the Cigar Lake lands other than the area on ML-5521 from which the Mineral Reserves are to be mined. Cameco has proven expertise in operating uranium mines and mills in Saskatchewan and has been the mine operator for the Cigar Lake lands with respect to ML-5521 since 2002.

Figure 4-2 shows the Cigar Lake Mineral Lease and Mineral Claims as currently registered with the Province of Saskatchewan.

Figure 4-2: Mineral Lease and Claims Map



4.3 Surface Tenure

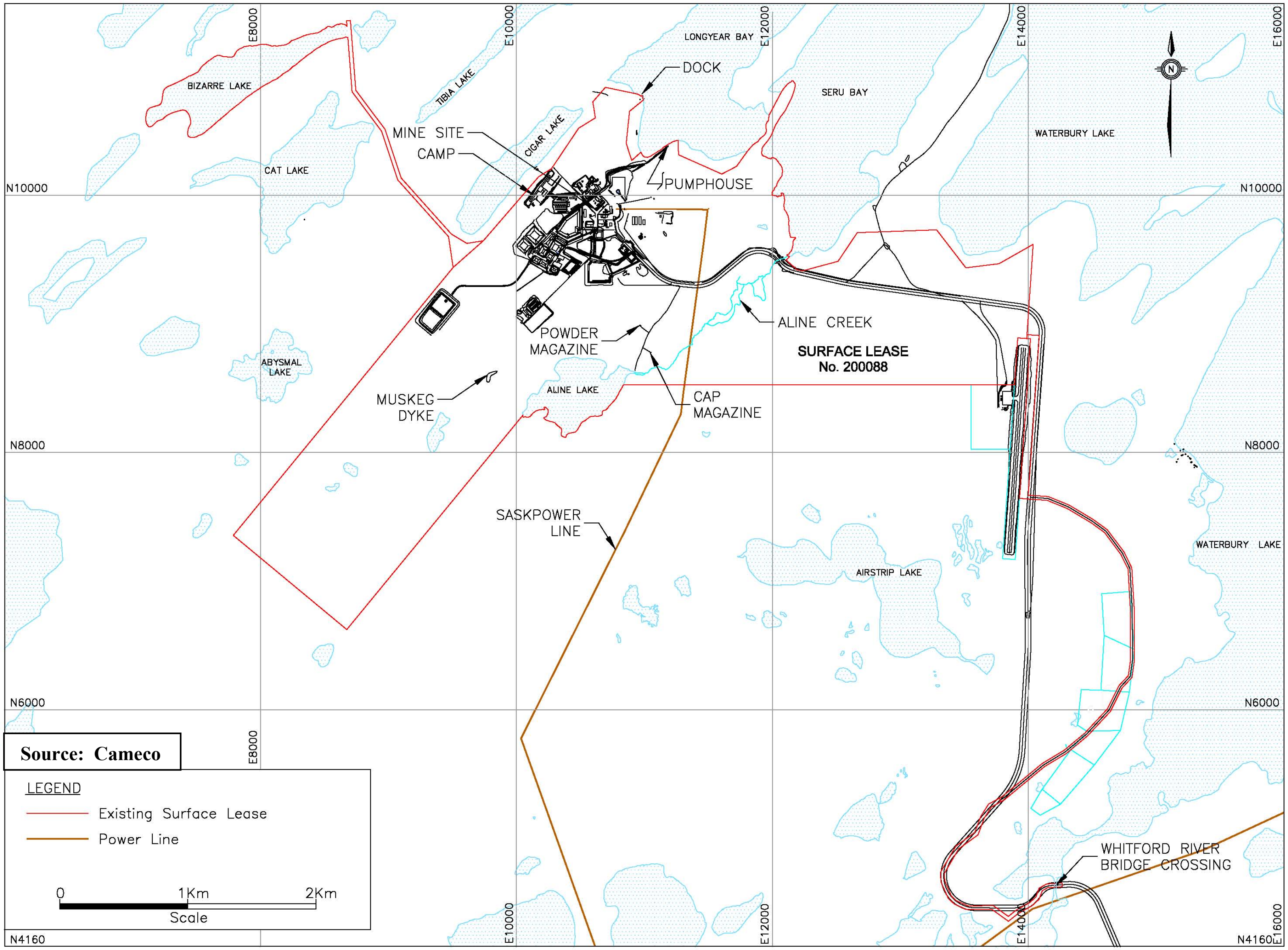
The surface facilities and mine shafts for the Cigar Lake project are located on lands owned by the Province of Saskatchewan. Cameco acquired the right to use and occupy these lands for the purpose of developing the Cigar Lake deposit under a surface lease agreement with the Province of Saskatchewan. The most recent surface lease was signed to be effective in July 2011. The term of this surface lease expires May 31, 2044. The surface lease area has been increased for Cameco to implement its plans to discharge treated effluent directly to Seru Bay of Waterbury Lake. In addition, the area covering the Cigar Lake airstrip was amalgamated into this surface lease. The Cigar Lake surface lease covers a total area of 1,042 ha of Crown land. It covers a portion of ML-5521 along with claims S-106555 to 106560, inclusive, and S-106562.

The Province of Saskatchewan uses surface leases as a mechanism to achieve certain environmental protection and socio-economic objectives. As a result, the Cigar Lake surface lease contains certain undertakings from the CLJV in that regard, including annual reporting on the status of the environment, land development and progress made on northern Saskatchewan employment and business development.

Figure 4-3 shows the Cigar Lake general site arrangement with the outline of the surface lease.

In 2011, annual rent was $164,366 for the Cigar Lake surface lease.

Figure 4-3: Map of Mine Facilities and Surface Lease



February 24, 2012

4.4 Royalties

For a discussion of royalties, see Section 22.6.

4.5 Known Environmental Liabilities

For a discussion of known environmental liabilities, see Section 20.7.

4.6 Permitting

For a discussion of permitting, see Section 20.3.

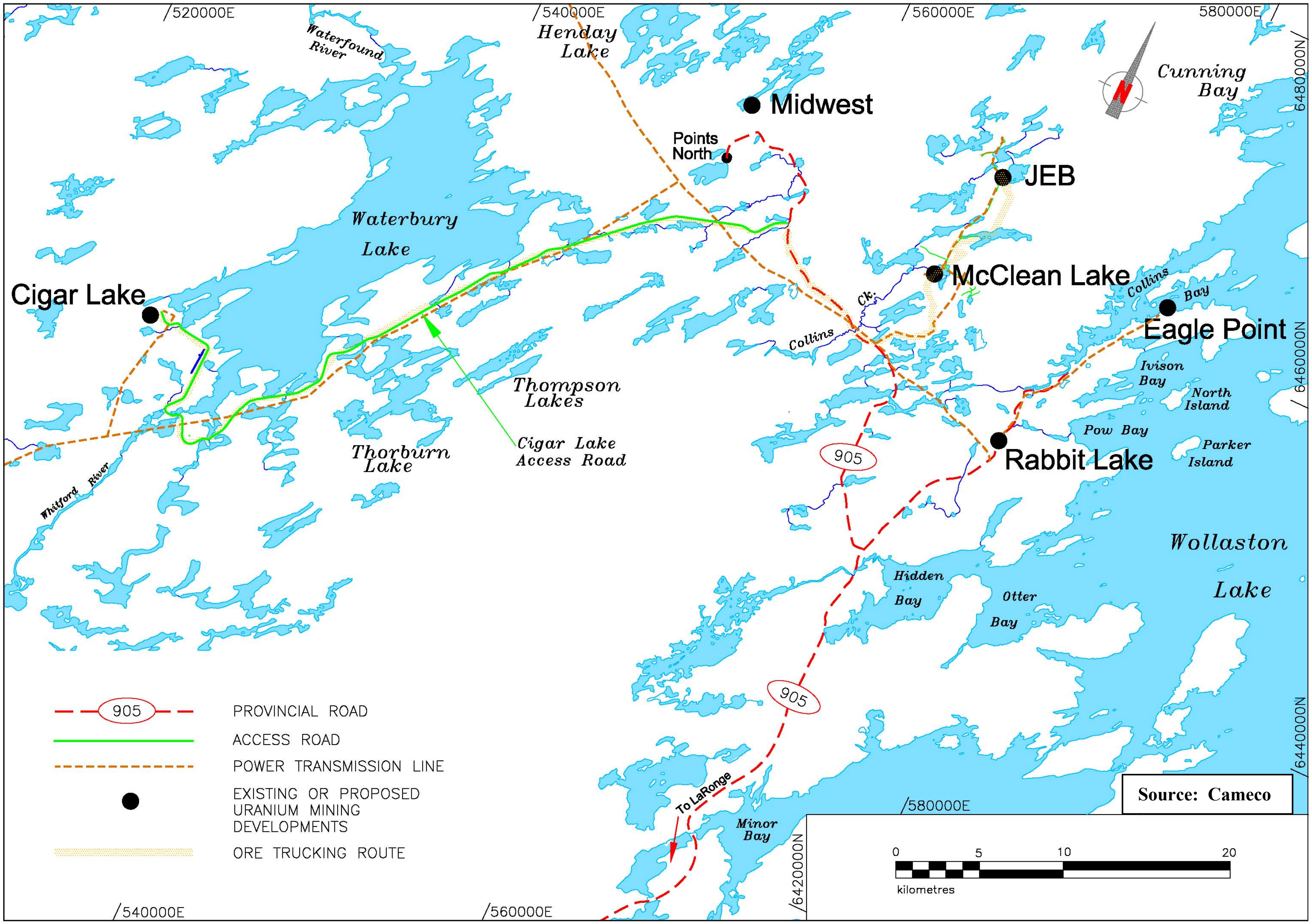
5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

The property is accessible by an all-weather road and by air. Supplies are transported by truck and can be shipped from anywhere in North America through Cameco's transit warehouse in Saskatoon. Trucks travel north from Saskatoon, on a paved provincial road through Prince Albert and La Ronge and further north along the gravel surfaced Provincial Road 905, and finally to the mine site via a 52 km long, two lane gravel road. The latter section was upgraded by Cameco, during the summer of 2006 and is accessible to the public from the intersection with Provincial Road 905 to the access gate near the Cigar Lake airstrip situated approximately six km from the mine site. *Figure 5-1* shows the regional location of the Cigar Lake site and local roads.

An unpaved airstrip is located east of the mine site, allowing flights to the Cigar Lake property.

Figure 5-1: Cigar Lake Site – Regional Location and Roads



5.2 Climate

The climate is typical of the continental sub-arctic region of northern Saskatchewan. Summers are short and rather cool, even though daily temperatures can reach above 30 °C on occasion. Mean daily maximum temperatures of the warmest months are around 20 °C and only three months on average have mean daily temperature of 10 °C or more. The winters are cold and dry with mean daily temperature for the coldest month below minus 20 °C. Winter daily temperatures can reach below minus 40 °C on occasion.

Freezing of surrounding lakes, in most years, begins in November and breakup occurs around the middle of May. The average frost-free period is approximately 90 days.

Average annual total precipitation for the region is approximately 450 mm, of which 70% falls as rain, more than half occurring from June to September. Snow may occur in all months but rarely falls in July or August. The prevailing annual wind direction is from the west with a mean speed of 12 km/h.

Site operations are carried out year round despite cold winter conditions. The fresh air necessary to ventilate the underground working areas is heated during winter months using propane-fired burners.

5.3 Physiography

The topography and vegetation at the Cigar Lake property are typical of the taiga forested land common to the Athabasca Basin area of northern Saskatchewan. The area is covered with between 30 to 50 m of overburden. The terrain is gently rolling and characterized by forested sand and dunes. Vegetation is dominated by black spruce and jack pine. Occasional small stands of white birches may occur in more productive and well-drained areas. Lowlands are generally well drained, but also can contain some muskeg and poorly drained bog areas with vegetation varying from wet open non-treed vistas to variable density stands of primarily black spruces as well as tamaracks depending on moisture and soil conditions. Productive lichen growth is common to this boreal landscape mostly associated with mature coniferous stands and treed bogs.

The mine site elevation is approximately 490 masl and Waterbury Lake is approximately 455 masl. The body of water known as Cigar Lake which, in part, overlays the deposit, is approximately 464 masl.

5.4 Local Resources

The closest inhabited site is Points North Landing, 56 km northeast by road from the Cigar Lake mine site, close to where the site access road connects to Provincial Road 905. The community of Wollaston Lake is approximately 80 km by air east of the Cigar Lake site. The Cigar Lake site is in close proximity to two other uranium/milling operations: AREVA's McClean Lake operation is approximately 69 km northeast by road and Cameco's Rabbit Lake operation is approximately 87 km east by road.

Athabasca Basin community resident employees and contractors fly from various pick-up points in smaller airplanes to the mine site. Southern resident employees and contractors fly to site from Saskatoon with stop-over pick-up points in Prince Albert and La Ronge. The number of weekly flights varies with the size of the workforce. Most company employees are on a week-in and week-off schedule. Contractor employees are generally on a longer work schedule.

Personnel are recruited on a preferential basis: initially from the communities of northern Saskatchewan, followed by the province of Saskatchewan, and then outside the province.

Site activities, such as development and construction work, are tendered to a number of contractors which have the ability to hire qualified personnel from the major mining regions across Saskatchewan and Canada.

The Cigar Lake site is linked by road and by air to the rest of the province of Saskatchewan facilitating easy access to any population centre for purchasing of goods at competitive prices. Saskatoon is a major population centre some 660 km south of the Cigar Lake deposit with highway and air links to the rest of North America.

5.5 Mine and Infrastructure

The Cigar Lake site has sufficient surface rights to meet its future mining operation needs based on the current Mineral Reserves and to accommodate the necessary site facilities and infrastructure including personnel accommodation, access to water, airport, site roads and other necessary buildings and infrastructure.

Site facilities at the end of construction will include:

- 1,600 m long gravel airstrip and terminal;
- permanent residence and recreation complex;
- construction camp;
- administration building (including maintenance and warehouse facilities);
- water supply, treatment and distribution facilities;
- water treatment plant, freeze plant and concrete batch plant;
- Shaft No. 1 and Shaft No. 2 headframes and hoisthouses;
- site roads;
- electrical substations and powerhouse (including backup generators);

- ore load-out facility;
- fuel and propane supply, storage and distribution facilities;
- miscellaneous infrastructure.

All current Mineral Reserves and Mineral Resources are contained within Mineral Lease ML-5521. Underground workings are confined to a small portion of the area of the Mineral Lease.

The known mineralization at Cigar Lake has been divided into two areas: the eastern area denoted Phase 1; and the western area denoted Phase 2. The body of water known as Cigar Lake overlies part of the Phase 2 mineralization. The Cigar Lake mine site has access to sufficient water from nearby Waterbury Lake for all planned industrial and residential activities. The site is connected to the provincial electricity grid with a 138-kV overhead power line. There are standby generators in case of power outages.

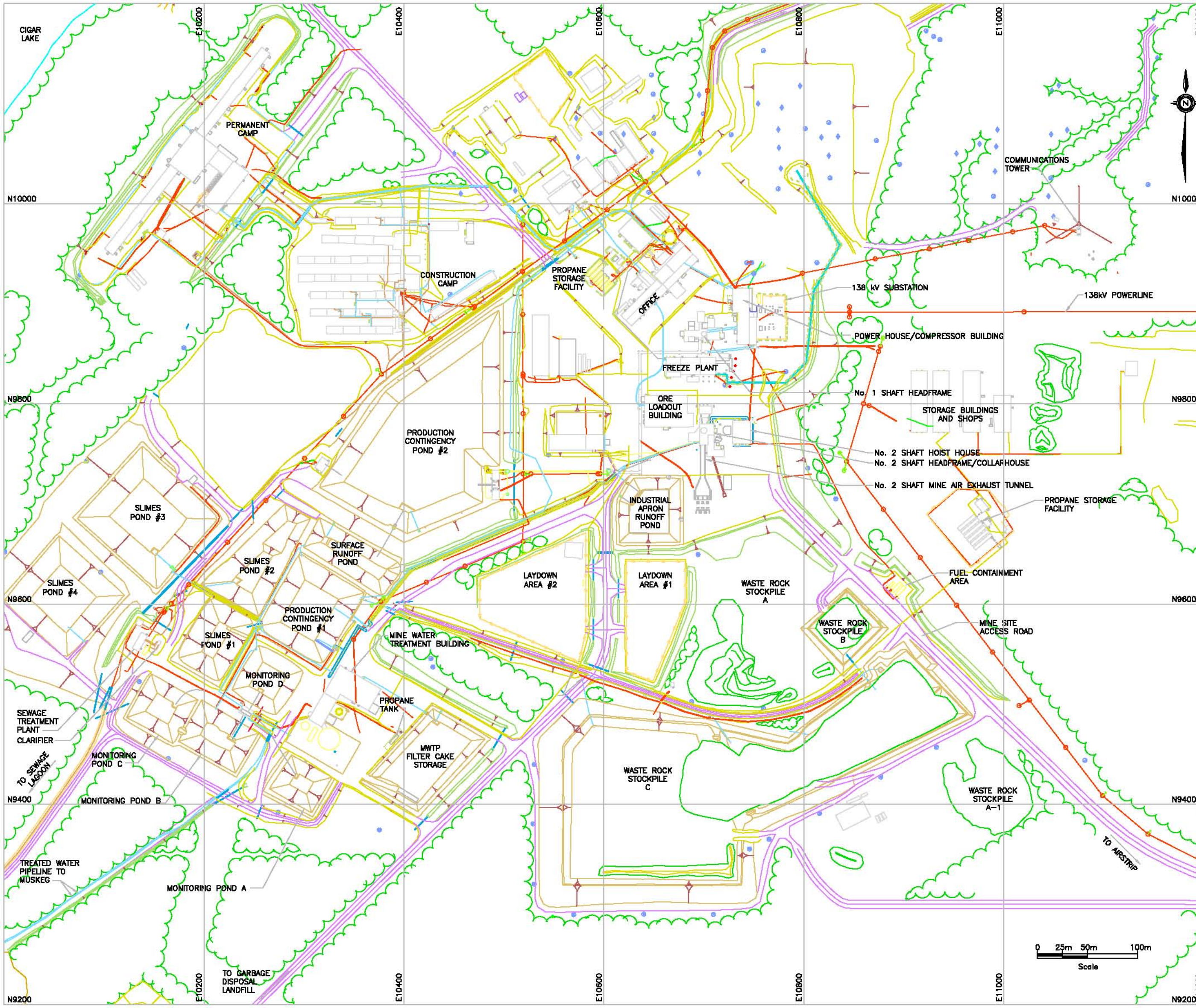
No tailings will be stored at the Cigar Lake site since all ore mined will be transported to AREVA's McClean Lake JEB mill for processing. All ore mined will be transported to the McClean Lake JEB mill for processing into yellowcake. The processing facility at the McClean Lake site is discussed in Section 17. The tailings management facility at the McClean Lake site is discussed in Sections 19.21 and 20.5.

A total of 53 t of high grade mineralization from the test mining is stored on the surface storage pad.

Waste rock piles from the excavation of the two shafts and all underground development are confined to a small footprint within the surface lease. The waste piles have been segregated into four separate areas: two clean waste piles, one mineralized waste pile (>0.03% U_3O_8); and one potentially acid generating waste pile. The latter two stockpiles are contained on lined pads; however, no mineralized waste has been identified in development to date. Waste rock management is further discussed in Section 20.6.

A site plan of the existing and planned surface facilities is shown in *Figure 5-2*.

Figure 5-2: Site Plan Showing Existing and Planned Surface Facilities



Source: Cameco

February 24, 2012

6 HISTORY

6.1 Ownership

There have been numerous changes in ownership of participating interests in the joint venture that governs Cigar Lake.

The original joint venture was established in 1976 between Canadian Kelvin Resources Ltd. and Asamera to explore the Keefe Lake area. Asamera was the operator of the joint venture. In 1977, Saskatchewan Mining Development Corporation (SMDC) acquired a 50% interest in the joint venture.

Around 1979, the Keefe Lake joint venture proceeded to divide the Keefe Lake area into three separate project areas of Dawn Lake, McArthur River and Waterbury Lake (which includes a portion of the lands now known as Cigar Lake).

In 1980, a joint venture agreement was entered into to govern exploration of the Waterbury Lake area and at that time SERU, the predecessor company to Cogema Canada Ltd. (Cogema), became the operator of the joint venture.

Effective January 1, 1985, the Waterbury Lake Joint Venture Agreement was terminated and replaced by a new joint venture agreement. Under the new joint venture agreement, the joint venture divided the Waterbury Lake area into the Waterbury Lake lands and the Cigar Lake lands. Cogema was appointed operator of the Waterbury Lake lands and Cigar Lake Mining Corporation (CLMC) was appointed the operator of the Cigar Lake lands. The participating interests in the joint venture at the time were SMDC (50.75%), Cogema (32.625%), Idemitsu (12.875%) and Corona Grande Exploration Corporation (3.75%).

In 1988, Eldorado Resources Limited and SMDC merged to form Cameco.

Effective January 1, 2002, the Cigar Lake reorganization took place and the joint venture owners, Cameco (50.025%), AREVA (37.1%), Idemitsu (7.875%), and TEPCO (5%) entered into a new joint venture agreement to give effect to the reorganization and to govern further exploration, development and production from the Waterbury Lake lands and the Cigar Lake lands. This new joint venture was called the Cigar Lake Joint Venture (CLJV). AREVA was appointed the Waterbury Lake lands operator (which includes claims No. S-106540 to 106557 and 106559 to 106564).

As part of the 2002 Cigar Lake reorganization, the CLJV entered into the Mine Operating Agreement with Cameco to engage Cameco as mine operator to operate the Cigar Lake mine property (which property includes ML–5521, the Cigar Lake surface lease and the mine).

As a part of the 2002 Cigar Lake reorganization, the CLJV entered into the 2001 Contract Exploration Agreement to engage AREVA as contract exploration operator to operate the Cigar Lake Exploration property (Claim No. 106558 as well as the area of ML-5521 from which Mineral Reserves are not mined).

6.2 Exploration and Development History

Between 1976 and 1979, Asamera, as operator of the Keefe Lake Joint venture, conducted exploration work on the mineral property. This activity included lake sediment and water geochemistry, airborne magnetic and Input (Questor) surveys, airborne radiometric and VLF (Geoterrex) surveys, gravimetric (Kenting) and seismic surveys.

After the division of the Keefe Lake area into three separate projects, Cogema, as operator of the Waterbury joint venture project, revisited all field survey results and conducted a series of complementary exploration work on lake bottom sediment geochemistry and airborne high resolution magnetic (Geoterrex) surveys. Regional geology photo-interpretation as well as outcrop and overburden mapping and sampling activities were systematically conducted across the mineral property. Ground geophysical surveys allowed depth and conductivity evaluation of geological formations using electromagnetic frequency (Geoprobe EMR-16) and time (Crone DEEPEM) methods. During 1980, this detailed DEEPEM work activity was intensified, targeting several Waterbury Lake zones with conductor structures previously identified. These electromagnetic conductors were systematically drilled during the winter months of 1980-81. On May 9, 1981, the drilling crew brought to surface high-grade mineralized core from hole WQS2-015, which was the last hole planned to be drilled for the winter program.

Definition drilling programs were conducted throughout the 1980's. To date, the deposit and its surroundings have been defined by 406 drillholes and more than 178,000 m of core drilling from surface.

A test mine proposal to assess conditions and to field test new mining methods was approved on October 21, 1987. Test mining, including the sinking of Shaft No. 1 to a depth of 500 m and lateral development on 420, 465 and 480 m levels, was performed between that approval time and December 1992.

In September 1992, Government Environmental Review Panel guidelines were issued for the Cigar Lake project by the Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan. Later the same year, consulting firms were hired to perform engineering studies and, at the same time, metallurgical and environmental testing programs were launched.

In 1993, mine site activities were placed on a care and maintenance basis and initial engineering studies for development and operation of the property based on the jet boring mining method were started. These and other engineering studies were completed between 1993 and 1996. Several additions and improvements to site infrastructure were also performed.

In 1997, detailed engineering studies were undertaken for the purpose of developing a feasibility study of the mining project. In addition, testing of a specially designed tunnel boring machine with capability to install a high strength concrete liner (or mine development system) was conducted. In conjunction with this work, significant mine development was also carried out.

Environmental review commenced in January 1996 and was completed at the end of 1997. Early in 1998, the federal/provincial Joint Environment Review Panel issued recommendations to the federal and provincial governments and the CLJV that the project proceed to the next stage of licensing. In April 1998, both governments responded favourably to the Joint Environment Review Panel recommendations.

During 1999, the specially designed jetting tools for the jet boring machine were successfully tested within a three-metre diameter culvert lined raise filled with simulated ore.

In 2000, activities at the mine site were focused on the testing of several tools and systems forming the basis of the future mining method. The jet boring system was successfully tested in waste and frozen ore. In addition, the following tests were conducted successfully:

- Ore recovery from an underground slurry storage sump using a dredging clam bucket system; and
- Mining cavity and casing hole surveying system.

Further discussion of the test mining activities is provided in Section 16.1.3.

Early in December of 2000, the mine site was again placed on a care and maintenance basis.

A feasibility study was completed in May 2001, targeting peak annual production of 18 million pounds U_3O_8 during Phase 1 of the Cigar Lake project.

In December 2004, the CLJV approved development of Cigar Lake and construction of the project began in January 2005. The Cigar Lake project has been in the construction phase since that time. The current status of the development and construction of the Cigar Lake project is discussed in Section 21.1.

6.3 Historical Mineral Resource and Mineral Reserve Estimates

There are no historical estimates within the meaning of NI 43-101, as amended, to report.

6.4 Historical Production - Test Mining

Historical mine production from the Cigar Lake deposit results from test mining in ore conducted during three separate test mining programs and comprising five separate mining tests as follows:

- Boxhole boring of two cavities in 1991
- Jet boring tests No. 1, 2 and 3 in 1992
- Jet boring industrial tests in 2000 - 4 cavities in waste and 4 cavities in ore

Production from the tests is estimated to be approximately 767 tonnes of mineralized material at an average grade of 17.4% U_3O_8 and containing approximately 295,000 lbs U_3O_8 as shown in *Table 6-1*.

Table 6-1: Historical Production – Test Mining

Test Name and Number	Date of Test	Mineralized Material (t)	Production U_3O_8 (lbs)	Grade % U_3O_8
Boxhole boring	October, 1991	53	20,100	17.3
Jet boring: JB-1 and JB-2	June, September 1992	13	4,500	15.6
Jet boring: JB-3	November - December, 1992	100	34,500	15.6
Jet boring: JBST-2000	September - November, 2000	601	235,500	17.8
Totals		**767**	**294,600**	**17.4**

The mineralized material from the historical production tests is still accessible except for the November-December, 1992 material, and is accounted as part of the Mineral Reserves.

Further discussion on the test mining activities is provided in Section 16.1.3.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Cigar Lake uranium deposit is located approximately 40 km within the eastern part of the Athabasca Basin of northern Saskatchewan, Canada. Like other major uranium deposits of the basin, it is located at the unconformity contact separating Helikian sandstones of the Athabasca Group from Aphebian metasedimentary gneisses and plutonic rocks of the Wollaston Domain. The Manitou Falls Formation, within the Athabasca Group, was deposited in an intra-continental sedimentary basin that was filled by fluviatile terrestrial quartz sandstones and conglomerates. The Athabasca Group appears undeformed and its actual maximum preserved thickness is about 1,500 m. On the eastern side of the basin, the sandstone units of the Manitou Falls Formation, and the metasedimentary gneisses that unconformably lie immediately beneath them, host most of the uranium mineralization. Overburden in the project area ranges from none, expressed by occasional outcrops, up to a thickness of 50 m.

The Lower Pelitic unit of the Wollaston Group, which lies directly on the Archean granite basement, is considered to be the most favourable unit for uranium mineralization. During the Hudsonian orogeny (1800-1900 Ma), the group underwent polyphase deformation and upper amphibolite facies metamorphism, with local greenschist facies retrograde metamorphism. The Hudsonian orogeny was followed by a long period of erosion and weathering and the development of a paleoweathering profile that is preserved beneath the unconformity.

7.2 Local Geology

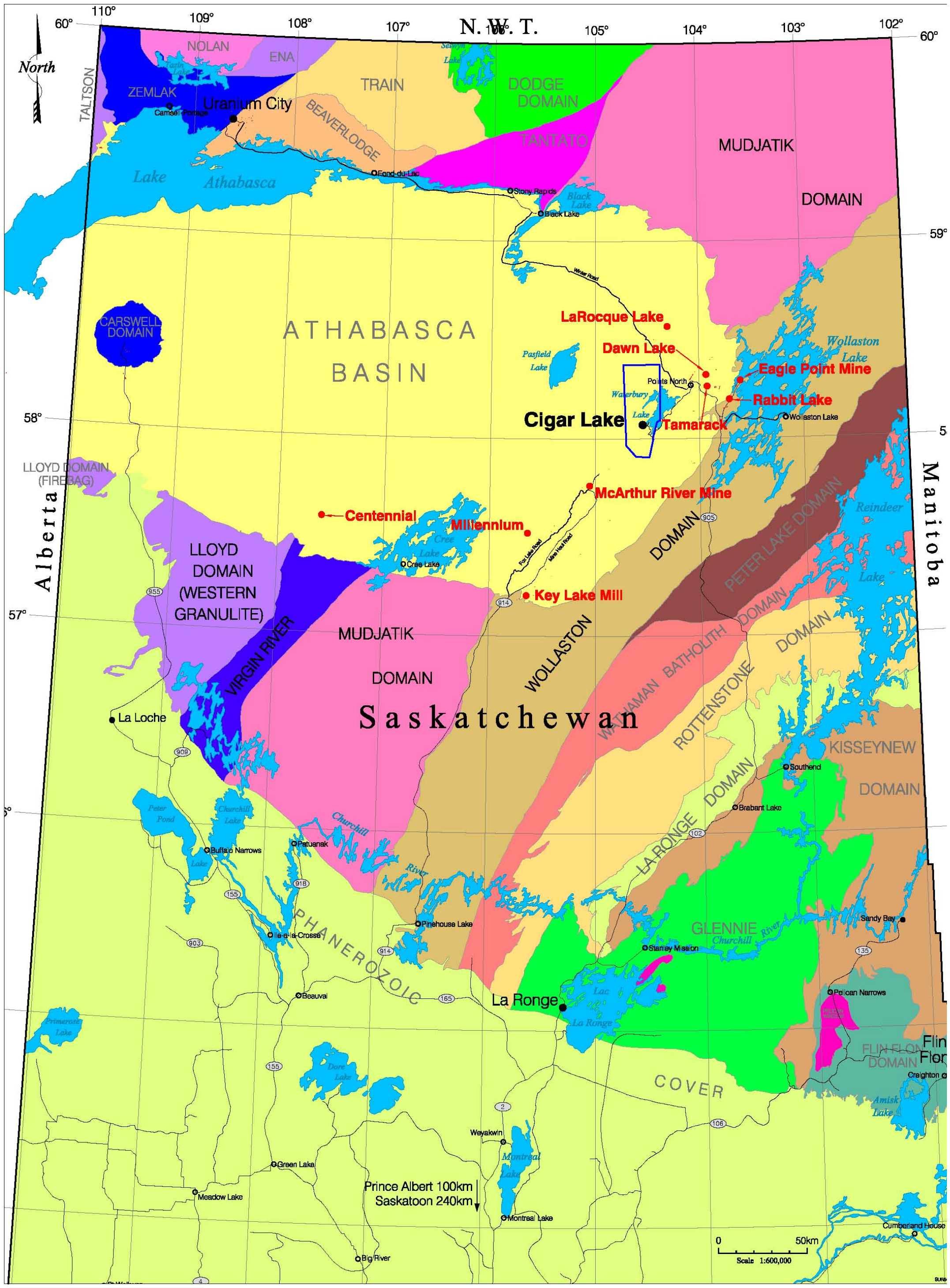
At Cigar Lake, the Manitou Falls Formation is 250-500 m thick and corresponds to units MFd, MFc, MFb and MFa. The conglomerate MFb unit hosts the Cigar Lake deposit as the basal conglomerate MFa is absent at the deposit, wedging out against an east/west, 20 m high, basement ridge, on top of which the deposit is located.

Two major lithostructural domains are present in the metamorphic basement of the property. These are as follows:

- a southern area composed mainly of pelitic metasedimentary gneisses (Wollaston Domain),
- a northern area with large lensoid granitic domes (Mudjatik Domain).

These lithostructural domains are shown in *Figure 7-1*.

Figure 7-1: Geological Map of Northern Saskatchewan



Source: Cameco

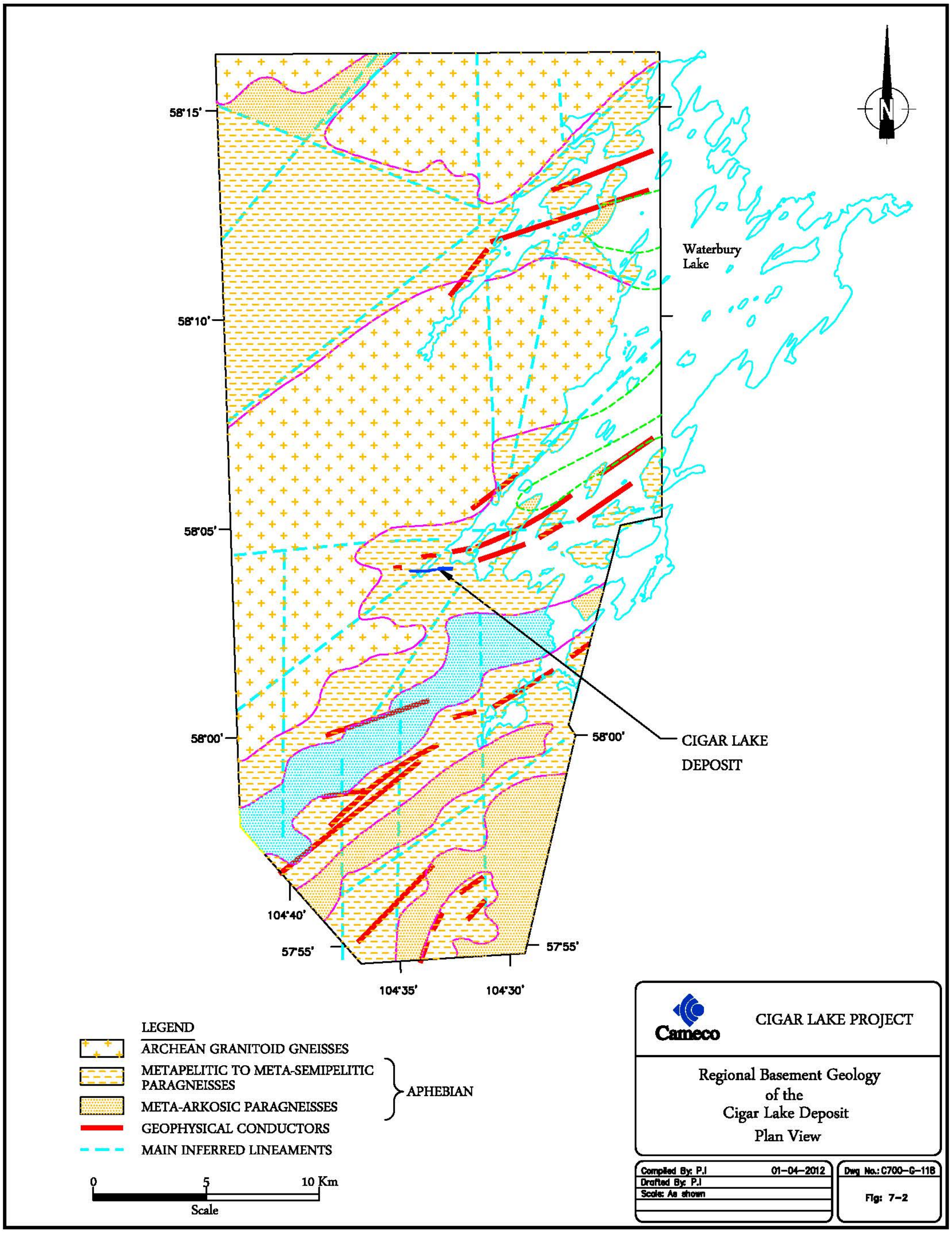
The Cigar Lake east trending pelitic unit, which is immediately beneath the deposit, is located in the transitional zone between the two domains. The metamorphic basement rocks in this unit consist mainly of graphitic metapelitic gneisses and calc-silicate gneisses, which are inferred to be part of the Lower Pelitic unit. Graphite and pyrite-rich "augen gneisses", an unusual facies within the graphitic metapelitic gneisses, occur primarily below the Cigar Lake deposit.

The mineralogy and geochemistry of the graphitic metapelitic gneisses suggest that they were originally carbonaceous shales. The abundance of magnesium in the intercalated carbonate layers indicates an evaporitic origin.

The structural framework in the Cigar Lake mine area is dominated by large northeast trending lineaments and wide east trending mylonitic corridors. The unconformable contact between these mylonites, which contain the augen gneisses, and the overlying Athabasca sandstones, are considered to be the most favourable features for the concentration of uranium mineralization, specifically where graphitic basement fault zones were locally reactivated as brittle faults after sandstone deposition.

The regional basement geology surrounding the Cigar Lake deposit is shown in *Figure 7-2*.

Figure 7-2: Cigar Lake Deposit – Regional Basement Geology



7.3 Property Geology

The Cigar Lake uranium deposit, which has no direct surface expression, is located at the unconformity between the Lower Proterozoic (Aphebian) Wollaston Group metasediments and the Middle Proterozoic (Helikian) Athabasca sandstone, at a depth between 410 and 450 m below surface. It has the shape of a flat-lying lens approximately 1,950 m in length, 20 to 100 m in width and ranges up to 13.5 m thick, with an average thickness of about 5.4 m. It shows remarkable longitudinal and lateral geological continuity. Its crescent shaped cross sectional outline closely reflects the topography of the unconformity.

The deposit and host rocks consist of three principal geological and geotechnical elements:

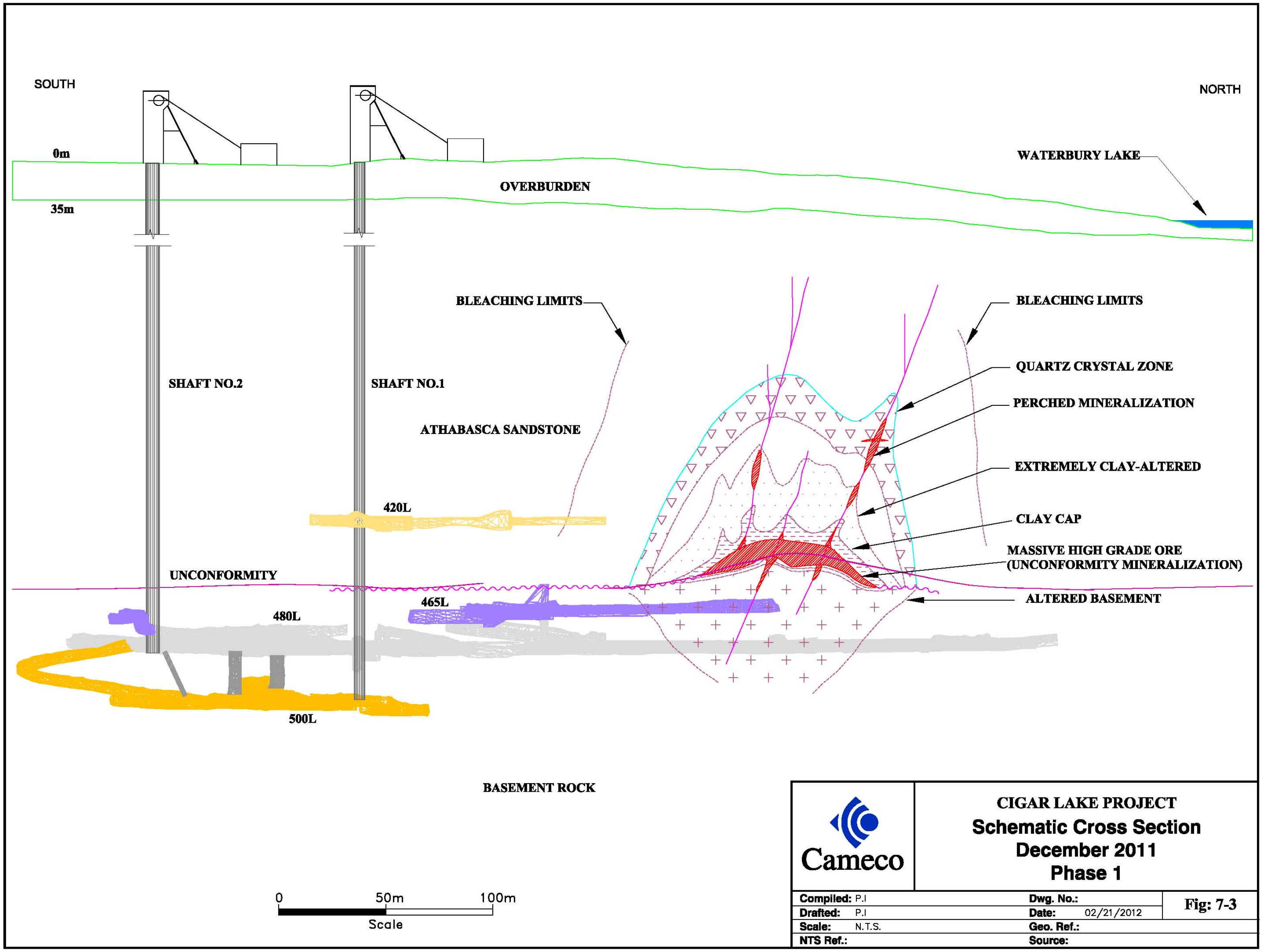
- the deposit itself;
- the overlying sandstone; and
- the underlying metamorphic basement rocks.

Faulting and strong hydrothermal alteration have produced the geotechnical conditions that exist today to challenge the extraction of the deposit.

The Cigar Lake deposit is controlled by an east-west trending structure developed within the graphitic metapelites of the Wollaston Group. It is surrounded by a strong alteration halo affecting both sandstone and basement rocks, characterized by extensive development of Mg-Al rich clay minerals (illite-chlorite). This alteration halo in the sandstone is centred on the deposit and reaches up to 300 m in width and height. In the basement rocks, this zone extends in the range of 200 m in width and as much as 100 m in depth below the deposit. The mineralization is hosted principally by the Athabasca sandstone and consists mainly of pitchblende and nickel and cobalt arsenides.

Figure 7-3 shows a schematic geological cross-section of the Cigar Lake deposit that illustrates the shape of the deposit and the alteration halo in the sandstone and the basement rocks.

Figure 7-3: Cigar Lake Deposit – Schematic Cross Section Looking West



7.4 Mineralization

Three distinct styles of mineralization occur within the Cigar Lake deposit, as shown schematically in *Figure 7-3*. These are as follows:

- high grade mineralization at the unconformity (“unconformity” mineralization), which includes all of the Mineral Resources and Mineral Reserves;
- fracture controlled, vein-like mineralization higher up in the sandstone (“perched” mineralization); and
- fracture controlled, vein-like mineralization in the basement rock mass.

The body of high grade mineralization located at the unconformity contains the bulk of the total uranium metal in the deposit and represents the only economically viable style of mineralization considering the selected mining method and ground conditions. It is characterized by the occurrence of massive clays and very high-grade uranium concentrations.

The unconformity mineralization consists primarily of three dominant rock and mineral facies occurring in varying proportions. These are quartz, clay (primarily chlorite with lesser illite) and metallic minerals (oxides, arsenides, sulphides). In the two higher grade eastern pods (Phase 1), the ore consists of approximately 50% clay matrix, 20% quartz and 30% metallic minerals, visually estimated by volume. In this area, the unconformity mineralization is overlain by a very weakly mineralized contiguous clay cap one to five metres thick. In the lower grade western lens (Phase 2), the proportion changes to approximately 20% clay, 60% quartz and 20% metallic minerals.

While pre-mineralization and post-mineralization faulting played major roles in creating preferential pathways for uranium bearing groundwater and to some extent in re-mobilizing uranium, the internal distribution of uranium within the unconformity mineralization has likely been controlled primarily by geochemical processes. This is reflected in the good continuity and homogeneity of the mineralization and its geometry, particularly in the eastern part of the deposit. A very sharp demarcation exists between well mineralized and weakly mineralized rocks, both at the upper and particularly at the lower surface of the deposit.

Uranium oxide in the form of uraninite and pitchblende occurs in both a sooty form and as botryoidal, metallic masses. It occurs as disseminated grains in aggregates ranging in size from millimetres to decimetres, and as massive metallic lenses up to a few metres thick floating in a matrix of sandstone and clay. Coffinite (uranium silicate) is estimated to form less than 3% of the total uranium mineralization. The mineralized rock is variably green, red and/or black in colour.

Uranium grades of the unconformity mineralization range up to 82% U_3O_8 for a 0.5 m interval from a single drillhole intersection within the mining area.

Geochemically, the deposit contains quantities of the elements Ni, Cu, Co, Pb, Zn, Mo and As, but in non-economic concentrations. Higher concentrations of these elements are associated with massive pitchblende or massive sections of arseno-sulphides.

The U-235 isotope ratio has been determined to be the naturally occurring value of 0.71%. Uranium decay series measurements show that, in general, equilibrium exists within the unconformity mineralization and bulk dissolution of uranium is not occurring. Primary age of the unconformity mineralization has been estimated at 1.3 billion years.

The deposit has been subjected to faulting subsequent to its formation which has contributed to the formation of vein-type mineralization that has been termed "perched" and basement mineralization. These mineralized bodies form volumetrically a very small part of the total mineralized rock and are of no economic significance at this time.

8 DEPOSIT TYPES

Cigar Lake is the world's second largest known high-grade uranium deposit. McArthur River, which is also majority owned and operated by Cameco is the largest known high-grade uranium deposit. The uranium grades of Cigar Lake's Mineral Reserves are over 100 times the world average for uranium deposits.

Cigar Lake is an unconformity related uranium deposit. Deposits of this type are believed to have formed through an oxidation-reduction reaction at a contact where oxygenated fluids meet with reducing fluids. The unconformity provided that contact. The Cigar Lake deposit occurs at the unconformity contact between rock of the Athabasca Group and underlying lower Proterozoic Wollaston Group metasedimentary rocks, an analogous setting to the Key Lake, McClean Lake, Collins Bay and McArthur River deposits. It shares many similarities with these deposits, including general structural setting, mineralogy, geochemistry, host rock association and the age of the mineralization.

Although the Cigar Lake deposit shows many similarities with other deposits of the Athabasca region, it is distinguished from them by its size, the intensity of its alteration process, the high degree of associated hydrothermal clay alteration and the presence of massive, extremely rich, high grade uranium mineralization.

The Cigar Lake deposit is similar to the McArthur River deposit in that the sandstone overlies the basement rocks and contains large volumes of water at significant pressure. However, unlike McArthur River, this deposit is flat lying.

9 EXPLORATION

The Cigar Lake deposit is located within ML-5521, which is surrounded by the 25 Mineral Claims. AREVA is responsible for all exploration activity on these 25 Mineral Claims, as per the CLJV joint venture agreements. The following two Sections (9.1 and 9.2) are a synopsis of exploration activities on the 25 Mineral Claims. For the purpose of the discussion in Sections 9.1 and 9.2, the 25 Mineral Claims are called the Waterbury Lake lands. Section 9.3 is a summary discussion of geophysical programs that have been conducted by Cameco on behalf of the CLJV within ML-5521 since the October 2006 water inflow.

Drilling activity within ML-5521 is described in Section 10.

9.1 Asamera 1976 – 1979

The current Waterbury Lake lands were initially staked by Asamera with the first three claim blocks staked in 1975 and a fourth in 1976 and an exploration permit created in 1977.

As operator of the Keefe Lake joint venture, Asamera conducted various field investigations from 1976 to 1979. The majority of Asamera's field investigations involved airborne and ground geophysical programs, followed by lake sediment and water sampling programs. Three diamond drillholes were completed during the 1978 campaign, but none intersected the unconformity. One drillhole was completed during the 1979 campaign, near the southern border of the property (Jigger Lake area).

A list of Asamera's activities is shown in *Table 9-1*.

Table 9-1: Asamera Summary of Exploration, Waterbury Lake Lands

Year	Drilling			Airborne Geophysics		Ground Geophysics	Other Exploration
	Type	Number	Metres Drilled	Type	Area	Type	Type
1976				Radiometric and Magnetic	Claim blocks only		Compilation geographical map
1977				INPUT and Magnetic	Claim blocks only	Marine seismic	Lake sediment sampling
1978	Diamond	3	Unknown, did not reach unconformity	INPUT and Magnetic	Permit only	Gravity Radon, VLF	Lake sediment sampling
1979	Diamond	1	Unknown	Magnetic			Lake sediment sampling

Source: AREVA

9.2 AREVA 1980 – Present

In March of 1980, SERU took over as operator of the Waterbury Lake project. During the years 1980 to 1986, SERU (which became Cogema Canada Ltd. in 1984, and subsequently AREVA in 2006) completed various airborne and ground geophysical programs, lake sediment and water sampling programs and substantial diamond drilling.

Initial exploration activities by SERU were conducted in the southern region of the Waterbury Lake lands near Jigger Lake. Thirteen exploration drillholes (totalling 5,208 m) were completed prior to the discovery hole during the first drilling campaign in 1981, eight of which were drilled on the Q17 grid (Jigger Lake). The last drillhole (WQS2-015) completed to a depth of 563 m in 1981 was located on the QS-2 grid south of Cigar Lake and was the discovery hole for the Cigar Lake uranium deposit. Exploration activity concentrated on deposit delineation over the next few years, as outlined in Section 10.

All exploration activities ceased after the 1986 field season for a period of 12 years until work on the Waterbury Lands recommenced in 1999. After initially focussing upon data compilation and a review of all work conducted to date, new exploration has focussed upon developing further understanding of the Cigar trend, and developing knowledge of the large, unexplored parts of the project. Concurrent with this new work, a program of reboxing, relogging and sampling of historical exploration drillholes was undertaken to develop a further understanding of the Cigar Lake mineralization, alteration processes and structural setting to aid with near-mine and greenfields exploration on the project.

Since the inception of exploration activities to the end of 2011, a total of 134 exploration diamond drillholes (totalling 66,987 m) and an additional 38 shallow drillholes (totalling 2,140 m) had been completed outside of ML-5521 by AREVA (or their predecessors) on the Waterbury Lake lands. Since the recommencement of exploration in 1999, 78 drillholes for 40,415 m have been completed.

Exploration drilling in 2006 confirmed the existence of unconformity style mineralization outside ML-5521 approximately 650 m east of Phase 1 mineralization. Further exploration has been conducted in this area since 2006 and has delineated a mineralized zone approximately 210 m in strike length and 30 m in across-strike width. Additional follow-up drilling is planned for this area in 2012.

The data from the exploration program on the 25 Mineral Claims is not part of the database used for the estimate of the Mineral Resources and Mineral Reserves at Cigar Lake. A figure displaying the location of all current exploration work areas outside ML-5521 is included as *Figure 9-1*. A list of all work completed outside ML-5521 between 1980 and 2011 is included as *Table 9-2*.

Figure 9-1: Exploration Work Areas – Waterbury Lake Lands

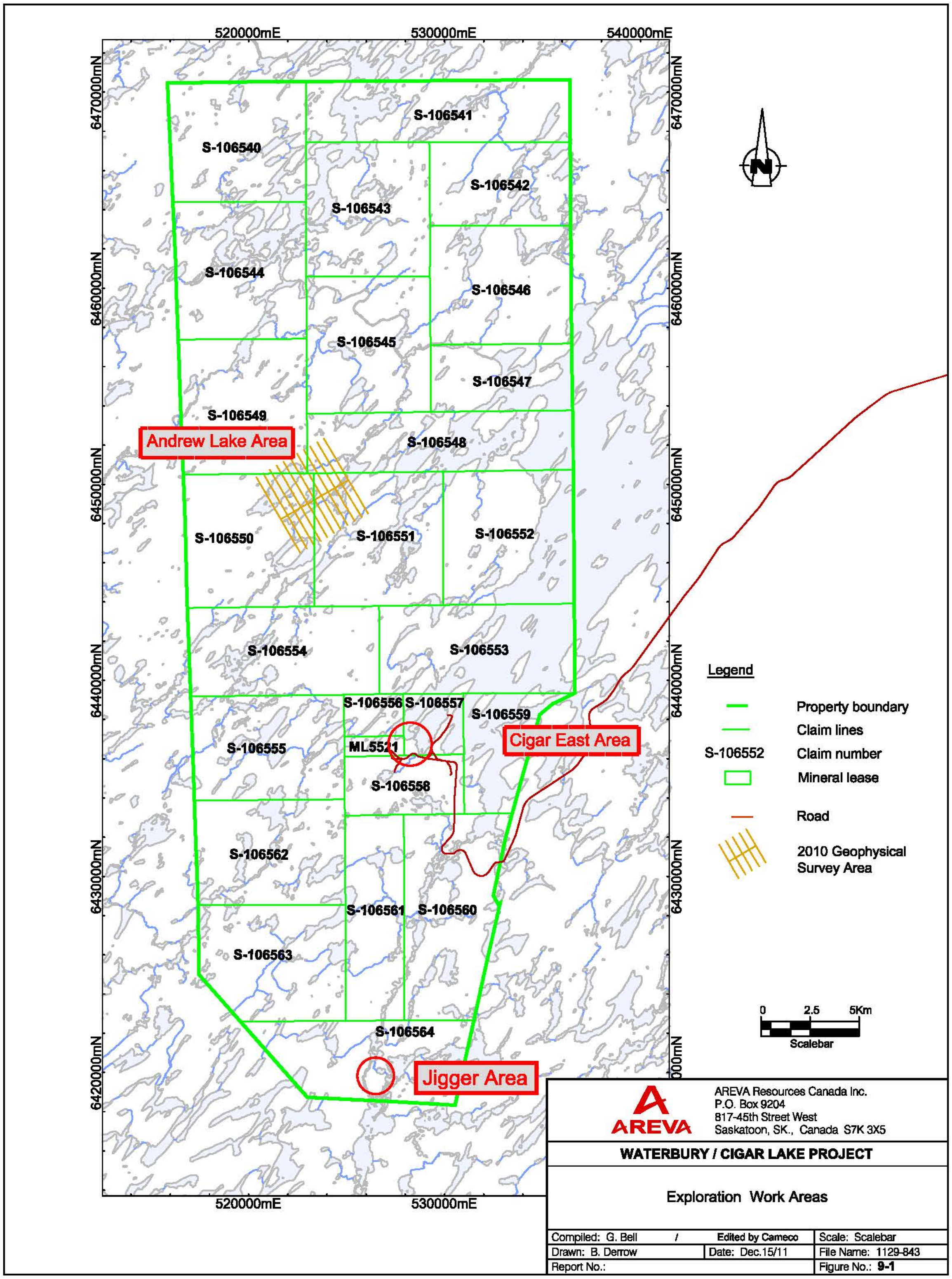


Table 9-2: AREVA, Summary of Exploration - Waterbury Lake Lands

Year	Holes Drilled			Airborne Geophysics		Ground Geophysics		Other Exploration
	Type	Number of Holes	Metres Drilled	Type	Line km	Type	Length	Type
1980				Magnetic VLF and radiometric survey	Project-wide	EM soundings DEEPEM	60 km	
1981	Diamond	13	5,208 m			DEEPEM	134 km	Lake sediment sampling
1982	Diamond	4	1,845 m			DEEPEM EM-37 Gravity	588 km 28 km 59 km	Lake sediment sampling
1983	Diamond	4	2,616 m	INPUT	2,685 km	DEEPEM	545 km	Lake sediment sampling
1984	Diamond	4	1,657 m					
1985	Diamond	14	7,132 m			DEEPEM	120 km	Lake sediment sampling
1986	Diamond Diamond	17 38	8,113 m 2,138 m			 DEEPEM	 135 km	 Shallow geochemistry
1987-1998	No exploration activities							
1999								Data Compilation Structural Study Historical drillcore logging and resampling
2000				GEOTEM	3,587 km			Boulder sampling
2001						Moving Loop EM Fixed Loop EM Pole-pole DC 2D Resistivity	26 57 5 km	
2002	Diamond	2	1,150m			Pole-pole 2D Resistivity Pole-pole DC3D Resistivity	16 km 51 km	
2003	Diamond	4	1,779 m			Moving Loop EM	11 km	Historical drillcore logging and resampling
2004						Moving Loop EM Pole- pole DC 2D Resistivity	29 km 18 km	Historical drillcore logging and resampling
2005	Diamond	4	1,705 m					
2006	Diamond	7	4,075 m			Pole- pole DC 2D Resistivity	84 km	Historical drillcore logging and resampling
2007	Diamond	13	6,515 m	FALCON Gravity survey	Project-wide	Moving Loop EM	11 km	Historical drillcore logging and resampling
2008	Diamond	12	5,492 m	Magnetic survey	Project-wide	Pole- pole DC 2D Resistivity Fixed Loop EM	86 km 51 km	Historical drillcore logging and resampling

Year	Type	Holes Drilled Number of Holes	Holes Drilled Metres Drilled	Airborne Geophysics Type	Airborne Geophysics Line km	Ground Geophysics Type	Ground Geophysics Length	Other Exploration Type
2009	Diamond	14	7,733 m			Fixed Loop EM Small Moving Loop EM Pole- pole DC 2D Resistivity	51 km 44 km 51 km	Historical drillcore logging and resampling
2010	Diamond	12	6,600 m					Historical drillcore logging and resampling
2011	Diamond	11	5,366 m			Moving loop EM	37 km	
Total		**172**	**69,124m**		**6,272 km**		**2,297 km**	

Note: This table includes all activity between 1980-2011 outside the area of ML-5521 (activity on the deposit is excluded).

Source: AREVA

9.3 Cameco 2007 - Present

After the 2006 inflow events, it was recognized that more detailed geophysical information in the immediate deposit area was required. The initial focus was to gain an understanding of the structure associated with the Shaft No. 2 inflow event. Ground surveys including gravity, TITAN (DC/IP resistivity and magnetotelluric survey), and VLF electromagnetic surveys were conducted in the summer of 2007 over a portion of the Phase 1 area of the deposit.

In the fall of 2007, a supplementary geophysical program was conducted over a portion of the Phase 1 area of the deposit to identify major structures within the sandstone column. The survey was conducted in six boreholes to produce three Vertical Seismic Profiles (VSP) and six single-hole side-scan seismic surveys around the mine site to meet these objectives. Both of these survey designs are best for optimally imaging vertical to sub-vertical structures at various scales based on their input frequencies.

The application of the knowledge gained of structures and fault zones, identified through the correlation of all the geophysical datasets – particularly seismic – with geological mapping and engineering parameters has allowed for better mine planning and mitigation of potential risk.

10 DRILLING

10.1 Surface Drilling

The Cigar Lake uranium deposit was discovered in 1981 by a regional program of diamond drill testing of geophysical anomalies (electromagnetic conductors) located by airborne and ground geophysical surveys, when drillhole number WQS2-015 was drilled. The deposit was subsequently delineated by surface drilling during the period 1982 to 1986 and followed by several small campaigns of drilling for geotechnical and infill holes to 2007. An additional 186 holes were drilled from 2007 through 2011 for various geotechnical, geophysical, delineation and freezing programs. The number of holes that have been drilled within ML-5521 are listed in *Table 10-1*.

Table 10-1: Summary of Holes Drilled within ML-5521

Year	No. of Mineralized Holes	No. of Non-Mineralized Holes	Total Drilled (m)
1981	1	-	562
1982	10	15	12,417
1983	39	29	26,971
1984	29	31	26,415
1985	3	20	10,918
1986	6	3	3,898
1987	-	5	2,331
1988	-	-	-
1989	1	1	866
1990	4	-	2,127
1991	-	-	-
1992	11	1	1,977
1993	-	-	-
1994	-	1	502
1995-1997	-	-	-
1998	8	-	1,473
1999	-	1	518
2000-2001	-	-	-
2002	-	1	510
2003-2006	-	-	-
2007	-	21	9,267
2008	-	19	7,031
2009	5	9	7,042
2010	24	21	19,446
2011	74	13	43,984
Total	**215**	**191**	**178,255**

Source: Cameco

A total of 178,255 m of diamond drilling from surface has been drilled in 406 holes to delineate the deposit and to assess the geotechnical properties of the deposit and host rocks. In 2010 and 2011, Cameco completed, as part of a

Phase 1 surface drilling program, 58 delineation and geotechnical drillholes for a total of 24,739 m.

Of the 406 surface drillholes and wedged intersections drilled, 215 have been drilled within the geologically interpreted deposit limits. Note that a total of 66 of the 215 holes drilled within the deposit limits were not included in the current version of the Mineral Resource and Reserve model. These excluded holes are from the Phase 2 delineation and Phase 1 surface freeze programs, where drilling is ongoing. The other 191 holes were drilled for purposes of exploration and geotechnical assessment, including investigation of ground conditions in areas of proposed mining development and sampling for determination of material properties. Seven of the 191 holes were drilled to test ground conditions in areas of proposed shafts.

The locations of the drillholes in the Phase 2 and Phase 1 areas are shown in *Figure 10-1* and *Figure 10-2*, respectively, except for the underground freezeholes.

The higher grade, eastern part of the deposit (Phase 1 area) was discovered in 1983. Drilling in the eastern part of the deposit was initially done at a nominal drillhole grid spacing of 50 m east-west by 20 m north-south. A surface drill program was conducted in 2010-2011 to tighten up the spacing in areas with gaps in coverage. Drillholes in the Phase 1 portion of the mineralization consist of 171 holes that intersected ore grade unconformity style mineralization, 23 holes that intersected only low grade mineralized rock or fracture controlled mineralization, and 121 holes intersected no mineralization. The Phase 1 totals also include 41 mineralized surface freezeholes drilled in 2011. These holes have not yet been incorporated into the Mineral Resource and Mineral Reserve model as the 41 completed holes represent a small portion of the Phase 1 area of the deposit and the majority of surface freezeholes remain to be drilled.

The western part of the deposit (Phase 2 area) has been outlined by 91 holes in total, of which 44 holes intersected unconformity style mineralization, 18 holes intersected low grade or fracture controlled mineralization, and 29 holes intersected only weak mineralization or were barren. The totals include 30 holes drilled in 2011 as part of a surface delineation program for the Phase 2 area.

The 30 holes from the 2011 drilling program have not yet been incorporated into the Mineral Resource model as that drilling is ongoing and assay results are pending. Preliminary results from the program are shown in Table 10-2. The mineralized zones of drillhole 378 were not probed (assay results are pending) as a result of difficulties experienced during drilling.

Table 10-2: Phase 2 - 2011 Drill Results (Probe Equivalent)

Hole No.	From (m)	To (m)	Length (m)	Grade ($e\%U_3O_8$)
371	439.3	442.9	3.6	0.42
372	438.3	442.2	3.9	26.23
373	431.8	433.6	1.8	0.16
374	459.2	468.9	9.7	1.12
375	437.6	447.1	9.5	13.85
376	457.1	463.6	6.5	2.02
377	423.1	432.1	9.0	3.02
378	-	-	no probe results	-
379	458.4	460.6	2.2	3.07
392	423.6	432.3	8.7	1.65
393	432.7	435.0	2.3	0.31
394	424.7	438.8	14.1	0.11
395	433.8	441.7	7.9	1.39
396	438.4	442.8	4.4	13.77
397	428.7	439.3	10.6	23.3
398	433.3	436.3	3.0	8.5
399	438.0	442.5	4.5	0.42
400	439.5	441.2	1.7	0.35
401	430.6	444.4	13.8	16.2
402	428.8	430.7	1.9	0.71
403	441.0	444.5	3.5	1.42
404	424.7	430.1	5.4	19.96
405	401.0	401.3	0.3	0.24
406	435.4	437.7	2.3	4.26
407	425.3	431.9	6.6	31.6
408	424.6	432.3	7.7	1.6
409	-	-	barren	-
410	431.9	440.4	8.5	4.56
411	429.5	439.3	9.8	15.05
412	431.5	433.4	1.9	0.11

The orientation and shape of the deposit was recognized at an early stage of the exploration drilling. It was soon learned that the bulk of the mineralization was of high grade and positioned at and sub parallel to the unconformity, although vein like bodies of mineralized rock were also present. Subsequently, almost all drilling was completed using vertical drillholes rather than inclined drillholes because it was recognized that vertical intersections were essentially normal to the dominant orientation of the deposit. These intersections therefore represent the true thickness of the flat lying deposit.

Well established drilling industry techniques were used in the drilling programs, including wireline core drilling. Core recovery was generally very good; in some areas where ground conditions dictated, triple tube drilling to maximize core recovery was done. Wedging techniques were used in some areas to obtain step out intersections without the expense of collaring additional holes. A total of 70 wedged holes have been completed.

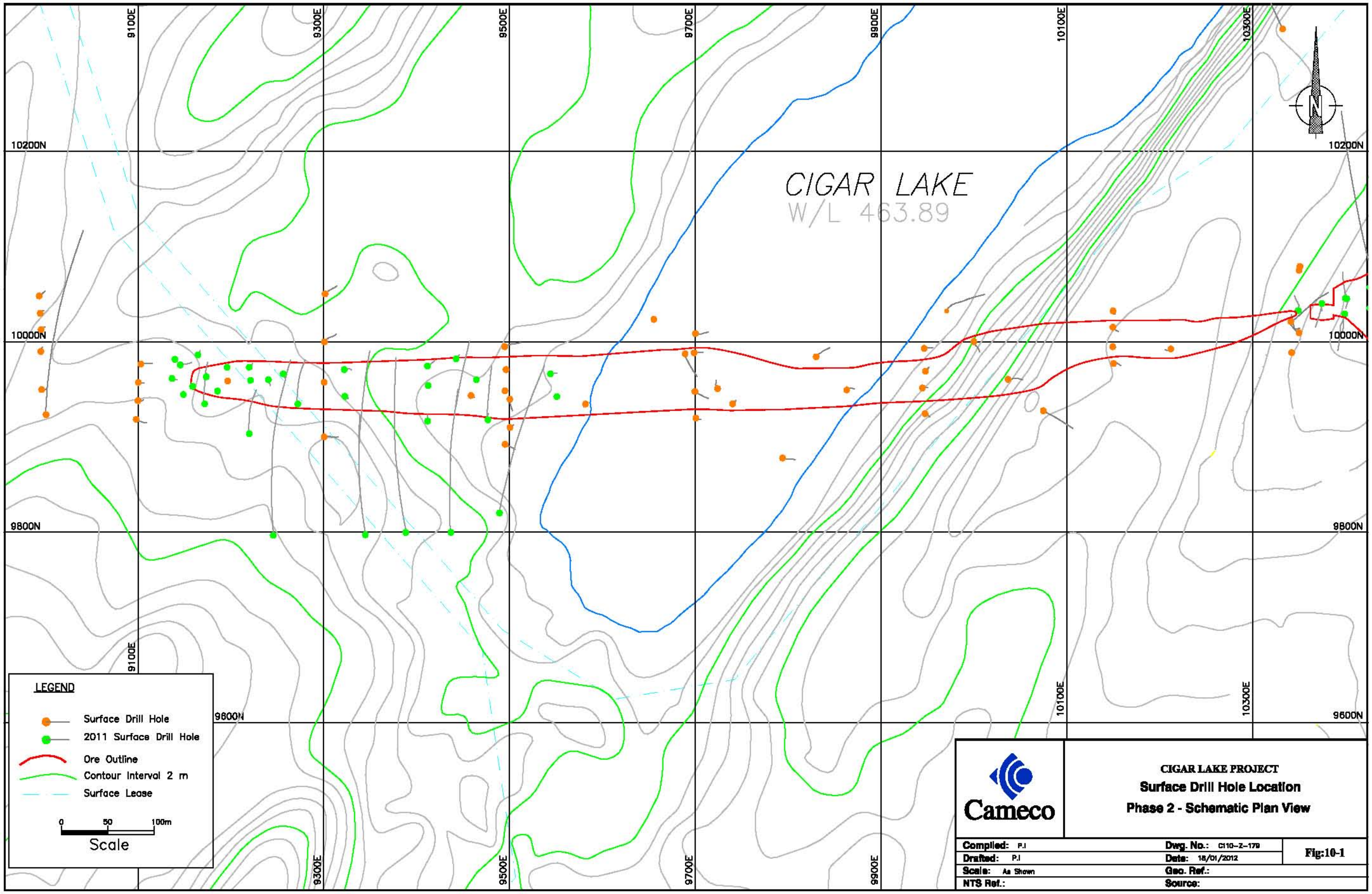
All pre-2007 holes were surveyed for direction using single shot or multi-shot surveying tools. Holes drilled since January 2007 have been surveyed either with a gyroscope or a Reflex tool.

The more recent surface drillholes (since 1988) have been grouted in their entirety. Holes drilled prior to 1988 were plugged in the range 250 to 350 m depth by mechanical plugs and/or cement plugs up to 10 m thick.

In almost all cases, gamma surveys have been conducted through the mineralization in these holes. For further discussion see Section 11.8.

The collar locations of drillholes within the area of the surface infrastructure footprint have been surveyed by Cameco and their locations confirmed.

Figure 10-1: Cigar Lake Deposit – Surface Drillhole Locations Phase 2



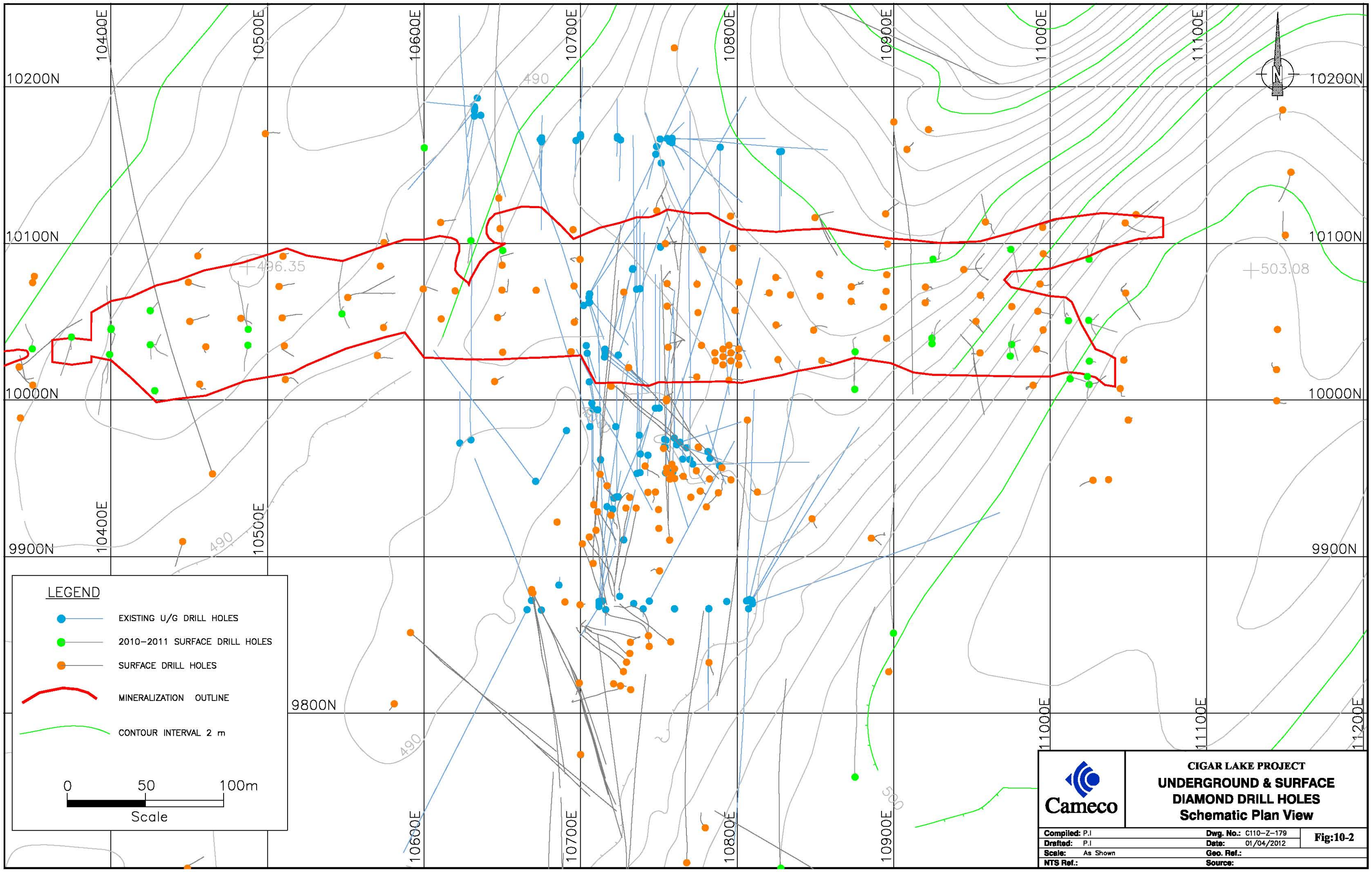
10.2 Underground Drilling

Diamond core drilling from underground locations has been done primarily to ascertain rock mass characteristics in advance of development and mining, both in mineralized and waste rock. In the period from 1989 to 2011, 222 underground diamond drillholes totalling 19,561 m were drilled. No underground drilling was conducted during the period 2007-2009, due to the flooding of the underground workings. Ten of the holes drilled from underground intersected the deposit. Pre-2001, most of the underground holes have been surveyed for deviation using single shot or multi-shot surveying tools. The 133 holes drilled since 2001 have used a Reflex tool for hole orientation.

Freezeholes, not included in the above totals, have been drilled into the deposit for the purposes of freezing the ground prior to mining. A total of 83 holes at a spacing of 1.0-1.5 m were drilled in two phases of drilling in 1991 and again in 1999. Generally, these holes were rotary drilled holes from which no core was recovered, however, in a limited number of cases, core was recovered and sampled and, in almost all cases, gamma surveys of the holes were done through the deposit. Freezehole drilling started up again in late 2004 with the start of the construction phase of development. During this phase, a total of 347 freeze and temperature monitoring holes were drilled, of which 182 have been gamma surveyed to estimate uranium content. The latter freezeholes were all drilled by percussion methods so no core was available for assays. The gamma surveys show the ore to generally conform with the projected ore outline. A gyro tool was used for directional surveying in the 2004-2006 phase of freezehole drilling. No underground freezeholes or temperature drillholes were completed from 2007 to 2011.

The locations of the underground and surface drillholes in Phase 1 are shown in *Figure 10-2*, except for the underground freezeholes.

Figure 10-2: Cigar Lake Deposit – Underground and Surface Drillhole Locations – Phase 1



10.3 Comparison of Exploration and Underground Freezehole Drill Results

The geological characteristics of the deposit evaluated during test mining were its location, grade and continuity. Core and rotary drilling into the test mine area, both from surface and from underground, and core sampling and gamma flux geophysical surveys within the drillholes, confirmed the location of the deposit and the grades and thickness of the high grade unconformity mineralization. These drillholes included freezeholes that were at a close spacing of 1.0 to 1.5 m apart. Throughout the test mine area, geological characteristics of the deposit were observed to conform within acceptable variability to those indicated by exploration and delineation surface drillholes spaced at 10 to 20 m along the fences and drilled prior to test mining.

Conversion coefficients were developed in 2011 to convert radiometric probe results to e%U_3O_8 grades for the Cigar Lake deposit. This correlation was derived using the assay and downhole radiometric probe data from the 2010-2011 surface delineation drill program. This has allowed the 182 underground freezeholes, with only probing results available, to be incorporated into the database for geological interpretation of which 160 were sufficiently mineralized to be included in the Mineral Resource and Mineral Reserve model. Although the underground freezeholes were probed under slightly different drillhole conditions, the estimated equivalent grades are considered representative of the in-situ uranium content.

10.4 Drilling, Sampling and Recovery Factors that Could Materially Affect the Accuracy of the Results

There are no known drilling, sampling or recovery factors that could materially affect the accuracy of the drill results. For a further discussion of sampling and recovery factors, see Section 11.

11 SAMPLING, PREPARATION, ANALYSIS AND SECURITY

11.1 Sample Density and Sampling Methods

Drilling in the eastern part of the deposit, an area 700 m long by 150 m wide, labelled Phase 1, has been done at a nominal drillhole fence spacing of 25-50 m (east-west), with holes at 20-25 m (north-south) spacing on the fences.

The western part of the deposit (Phase 2 area), an area 1200 m long by 100 m wide, was historically drilled at a nominal drillhole fence spacing of 200 m, with holes at 20 m spacing on the fences. An additional 30 infill drillholes were completed in 2011 for select areas of the Phase 2 area, locally reducing the drillhole spacing down to a 15 m x 15 m pattern. Geological, geotechnical and hydrological information was collected and will be assessed. Completion of the current drill program on the Phase 2 area is planned for early-2012.

Across the deposit, all surface holes were core drilled and gamma probed when possible. In-hole gamma surveys and hand held scintillometer surveys were used to guide sampling of core for assay purposes. After recognition of the significance of the deposit and its geometry, in 1982, sampling of core was thereafter primarily concerned with ensuring that all core within the mineralized zone containing at least 0.10% U_3O_8 was sampled and assayed. An automess gamma detector was used to determine the outer limits of sampling.

In the early stages of exploration drilling, sampling of mineralized intervals was done on a geological basis, whereby sample limits were determined based on geological differences in the character of the mineralization. Samples were of various lengths, up to 50 cm. Beginning in 1983, sampling intervals for core from the deposit have been fixed at the property standard 50 cm. Subsequently, all sample results have been mathematically normalized to the standard interval of 50 cm for Mineral Resource estimation purposes.

On each of the upper and lower contacts of the mineralized zone, one additional 50 cm sample was taken to ensure that the zone was fully sampled at the 0.10% U_3O_8 cut-off.

Except for some of the earliest sampling, in 1981 and 1982, the entire core from each sample interval was taken for assay. There were two reasons for doing this:

- to reduce the variability inherent in sampling, given the high-grade nature and variability of the grades of the mineralization; and
- to minimize human exposure to gamma radiation and radon gas during the sampling process.

In total, more than 5,400 samples have been assayed from all the surface and underground holes drilled to define and delineate the deposit.

Sampling of drill core and gamma probing of underground drillholes was undertaken to the same standards as done for surface holes, for holes drilled into the deposit. However, as discussed in Section 10.2, most of the holes drilled into the deposit from underground were rotary holes for ground freezing, from which no core was recovered. In these holes, reliance has been placed on radiometric probing results for equivalent grade determinations used in the current Mineral Resource and Reserve model.

Sampling was done only after all other geological logging, including photography of the core, was done. Sampling was done in a separate room (laboratory) attached to the core shack, in order to maintain cleanliness in the laboratory area and to reduce radiation levels in the core logging area.

The typical sample collection process included the following procedures:

- Marking the sample intervals on the core boxes, at the standardized 50 cm sample length, by the geologist.
- Collection of the samples in plastic bags, taking the entire core.
- Documentation of the sample location, including assigning a sample number, and description of the sample, including radiometric values from a hand held device.
- Bagging and sealing, with sample tags inside bags and sample numbers on the bags.
- Placement of samples in steel drums for shipping.

11.2 Core Recovery

Reliance for grade determinations in mineralized rock has been placed primarily on chemical assays of drill core. Core recovery through the ore zone has generally been very good. Where necessary, uranium grade determinations have been supplemented by down-hole radiometric probing.

For Mineral Resource and Reserve estimation purposes, where core recovery was between 75 and 100%, the assayed value was deemed to be representative of the whole interval. If the core recovery was below 75%, the sample was replaced by length weighted probing values. These replacement values account for a small portion of the overall sample database as only 159 samples were identified with recoveries less than 75% out of a total of 3,271 assayed samples for Phase 1 mineralization.

From about 1983 onward, all drilling and sampling procedures have been standardized and documented. This has imparted a high degree of confidence in the accuracy and reliability of results of all phases of the work.

11.3 Sample Quality and Representativeness

Of the 406 surface holes drilled, 295 were cored with NQ size rods, 59 with HQ size rods, 49 with PQ size rods, and 3 with BQ size rods. The majority of samples were whole core assayed, with the exception of some intersections that were cut with a rock saw and sealed under plexiglass for display purposes. Some of this core remains available for viewing at the site in a gated compound. The practice of sampling the entire core reduces the sample bias inherent when splitting core.

Chemical assay results were systemically checked against radiometric results to ensure their accuracy. Sample pulps and reject materials are retained and systematically catalogued. Check assays were done on an as required basis.

11.4 Sample Composites with Values and Estimated True Widths

In total, more than 5,400 samples exist in the deposit database from 278 drillholes, both from underground and surface. Of these 278 drillholes with geochemical results, 140 (130 surface and 10 underground drillholes) were used in the estimation of Phase 1 and 19 (all surface drillholes) were used in the estimation of Phase 2. In addition to these holes, 170 holes with only probing results available (10 surface delineation drillholes and 160 underground freezeholes) were also used in the estimation of Phase 1.

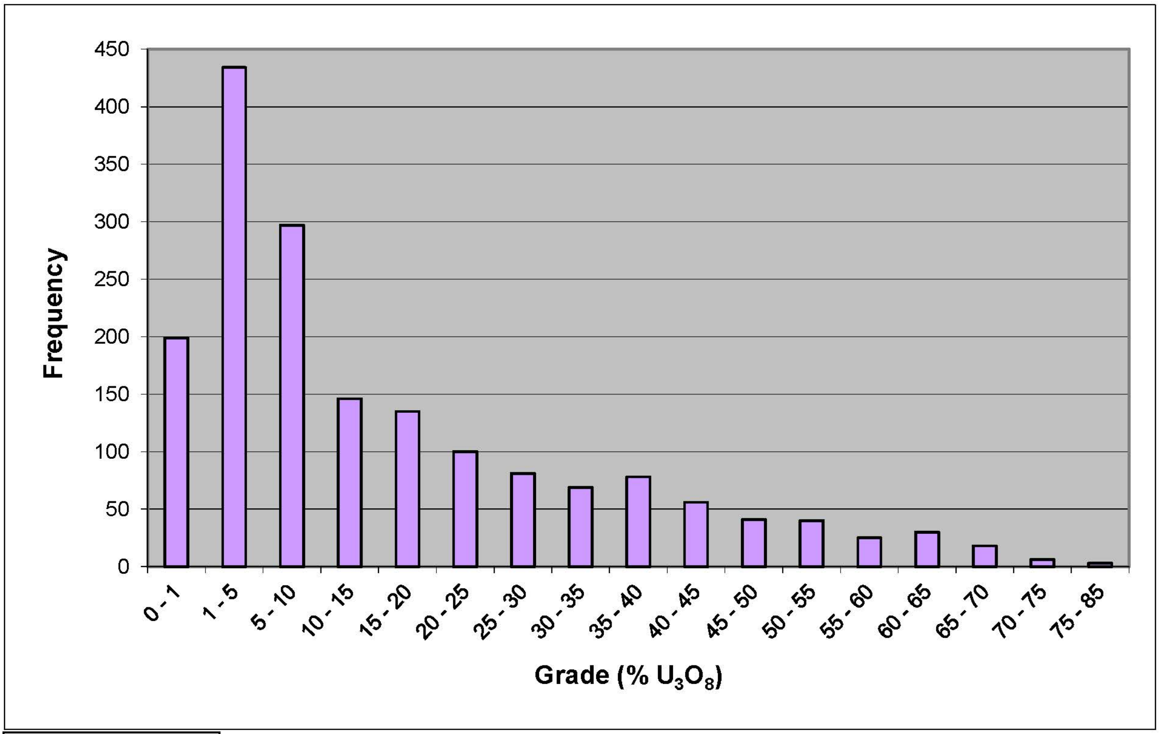
For Phase 1, mineralized intervals were calculated by taking the weighted average for the mineralized intercept in each drillhole using a 1.0% U_3O_8 cut-off grade. Surface drillholes are generally vertical and, as a result, their down hole intercepts represent the approximate true thickness of the zone since the mineralization is flat lying. The greatest true width among the drillhole intercepts is 13.5 m, and the lowest, 0.4 m with an average true width of approximately 5.4 m.

The highest and lowest assay values among the samples are respectively 82.9% U_3O_8 and 0.0% U_3O_8. The highest and lowest density values among the samples are, respectively, 8.44 g/cm^3 and 1.27 g/cm^3.

The highest and lowest grades of the drillhole intercepts used in the Mineral Resource estimate are respectively 53.2% U_3O_8 and 0.0% U_3O_8. The highest and lowest density values among the intercepts are respectively 4.69 g/cm^3 and 1.76 g/cm^3.

A histogram displaying the frequency distribution of the grades for all 1 m composites used in the estimation of Phase 1 is shown in *Figure 11-1*.

Figure 11-1: Histogram of Phase 1 Composite Grades (1 m length)



Source: Cameco

11.5 Sample Preparation by Cameco Employees

None of the samples that were sent to testing laboratories prior to January 1, 2002 were prepared by an employee, officer, or director of Cameco, however, limited assaying was carried out at Cameco's Rabbit Lake mill laboratory as discussed in Section 11.7. All samples for Cigar Lake prior to this date were prepared by employees of AREVA or its predecessor companies or CLMC. This would include all samples used in the Mineral Resource and Mineral Reserve estimates. The vast majority of mineralized samples were whole core assayed to avoid any sample bias from splitting the core. A discussion of the practice of whole core assaying is included in Section 11.1.

From 2009 to 2011, various surface delineation holes were drilled through Phase 1 mineralization. All mineralized intercepts were whole core sampled by Cigar Lake project personnel.

Since January 2009, the qualified person of this section has been involved with providing support and guidance for sampling of mineralization.

11.6 Sample Preparation

The majority of samples that were used for the Mineral Resource estimate were prepared and analysed by Loring Laboratories Ltd. (Loring), which is located in Calgary, Alberta.

Sample preparation at Loring consisted of drying the sample if necessary, followed by primary (jaw) and secondary (cone) crush, homogenization, and cutting the sample using a “Jones type riffle” down to 25-300 g portions for pulp preparation. The material was then pulverized in a “TM vibratory pulverizer” to maintain a 95% passing 150 mesh sieve. Samples were then rolled 100 times on a rolling mat to ensure total homogeneity and placed in a numbered sample bag ready for analysis. Any particulates created from sample preparation were carefully swept up from all areas and placed in a separate container for return to the property site along with all pulps and reject material after the sample had been analyzed.

Sampling since 2002 has been conducted by Saskatchewan Research Council Geoanalytical Laboratories (SRC), which is located in Saskatoon, Saskatchewan.

Sample preparation for U_3O_8 analysis at SRC involves jaw crushing to 60% @ -2 mm and splitting out a 100-200 g sub-sample using a riffler. The sub-sample is pulverized to 90% @ -106 microns using a puck and ring grinding mill. The pulp is then transferred to a labelled plastic snap top vial.

11.7 Assaying

Assaying of drill core for uranium has been performed at four different commercial laboratories and Cameco’s Rabbit Lake laboratory in the period from 1981 to 2011.

As referenced in Section 11.6, Loring did all the assaying for uranium between 1983 to 1994, and represents the majority of samples that were used for the Mineral Resource and Mineral Reserve estimate. They were not certified by any standards association at that time.

Cameco’s Rabbit Lake mill laboratory has carried out limited assaying since 1994 and SRC was used after 2001. The Rabbit Lake laboratory was not formally certified at that time, however, between July 1994 and July 1997, there were inter-laboratory tests on uranium determination (Rabbit Lake, Key Lake, Cluff Lake, Rio Algom, and SRC laboratories participated). Different analytical methods were used in the comparison studies. The results from the Rabbit Lake laboratory were within the accepted limits. The Rabbit Lake laboratory was accredited to International Standard ISO/IEC 17025:2005 on July 28, 2006 by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

Records indicate that SERU deemed that the assay results from two commercial laboratories, from drilling done in 1982, were not calibrated properly. As a result, the assay results from this period were adjusted in 1983 based upon a systematic comparison of laboratory results and cross checks. These adjusted grades applied to only 4 holes (38, 39, 39A, 40) out of 93 holes included in the Phase 1 Mineral Resource estimate. Nineteen of the 23 holes affected were from the Phase 2 portion of the mineralization. These holes have not been re-assayed and are included in the Mineral Resource and Mineral Reserve estimates.

Assaying by Loring was done by both the fluorimetric method and the volumetric method (volumetric ferrous iron reduction in phosphoric acid). All samples assaying greater than 5% U_3O_8 as determined by fluorimetry were re-assayed using the volumetric method. Chemical standards were systematically assayed on a regular basis to ensure the accuracy of the assaying procedure. Senior staff of the operator at the time (CLMC) visited Loring on a regular basis to view and discuss laboratory procedures with the Loring senior staff.

Assaying at the Rabbit Lake mill was done by the fluorimetric method for low grade samples, and by a combination of titration and x ray fluorescence for high grade samples, collected for metallurgical purposes in 1998.

Assaying by SRC involved digesting an aliquot of pulp in a 100 ml volumetric flask in concentrated 3:1 HCl:HNO3, on a hot plate for approximately one hour. The lost volume is then made up using deionized water prior to analysis by ICP-OES. Instruments used in the analysis are calibrated using certified commercial solutions. This method is ISO/IEC 17025:2005 accredited by the Standards Council of Canada.

Chemical assay results were systematically checked against radiometric results to ensure their accuracy. Sample pulps and reject materials are retained and systematically catalogued. Check assays were done on an as required basis.

11.8 Radiometric Surveying

The majority of the holes were surveyed for total gamma flux by in hole probing. In 1982 and to the end of the winter program in 1983, the surveying was done with a Century Geophysics probe model 9067 using a scintillometer for detection of gamma rays. This type of detector is efficient at relatively low flux rates but inefficient and inaccurate at high flux rates. Beginning in the summer of 1983, high flux probes using Geiger Müller tubes and manufactured by Cogema in France, Models ST22 2T and ST22 2T FC were used.

The usefulness of the high-flux tool lies in its ability to measure accurately the high gamma flux emanating from high-grade uranium mineralization without becoming saturated, and therefore unreliable. The ST22 2T probe uses two ZP 1200 Geiger Müller tubes whereas the ST22 2T FC probe uses two ZP 1320 tubes, which count at a rate of approximately one half that of the ZP 1200 tubes. The ZP-1320 tubes are therefore able to evaluate much higher grade uranium mineralization which would saturate the ZP-1200 tubes.

Total gamma flux measurements were collected at 10 cm intervals during probing.

Prior to each survey, the probe was checked by means of a gamma source to confirm operation. The Geiger Müller tubes in the probes were replaced on approximately an annual basis.

For the purpose of Mineral Resource estimation, chemical assay determinations of uranium grade were used. In areas of lost core or missing samples, reliance was placed on radiometric grade determined from the gamma probing.

Correlation and calibration of gamma probing results with chemical assays showed a very good correlation, indicating that secular equilibrium exists within the deposit. This also established the usefulness of gamma probing results as a reliable estimator of uranium grades.

During the delineation drilling period until 1990, drillhole No. 115 was maintained in an open, cased and accessible state for use as a calibration hole. On a regular basis, gamma probes were run in this calibration hole to confirm the physical stability and reliability of the probes, or to calibrate new probes introduced to the exploration program.

11.9 Density Determinations

The determination of densities at Cigar Lake has been documented by AREVA in Demange, 1985 and is described below. Actual laboratory determinations were done for many of the original intersections during the period 1982-84. From this group, a set of 146 samples were identified where the density measurement was deemed to be of superior quality. These samples were then used to produce three estimators of density as follows:

- as a function of the grades of uranium, nickel, cobalt, and aluminum;
- as a function of uranium, nickel and cobalt for holes where aluminum was not analysed; and
- as a function of uranium.

The formulas have subsequently been applied in holes where radiometric grades were used for assay determination, and where densities were not directly measured.

During 2009, 20 density samples were collected from an 8-hole surface drilling program and incorporated in the database. The validity of the 1985 density estimation formulas was confirmed as part of a third-party review.

Density sampling has continued through the 2010-2011 surface drillhole program and the density estimation formula will continue to be reviewed periodically as more results become available.

11.10 Quality Assurance/Quality Control (QA/QC)

From 1983-1994, assaying was done by Loring. For uranium assays up to 5% U_3O_8, twelve standards and two blanks were run with every sample batch (certified standards were used). For uranium assays over 5% U_3O_8, a minimum of four standards were analyzed with each run.

Quality control for the more recent assaying at SRC includes the preparation and analysis of standards, duplicates and blanks. Standards used are BL2a, BL-3, BL-4a and BL-5, all from CANMET, and an in-house sample, UHU-1. A standard is prepared and analyzed for each batch of samples and one out of every 40 samples is analyzed in duplicate. All quality control results must be within specified limits otherwise corrective action is taken.

To validate the core depths, the in-hole gamma survey results were compared to hand-held scintillometer surveys on core.

The QA-QC procedures that were used were typical for the time period of the analyses. The qualified person for this section has reviewed the data and is of the opinion that the data are of adequate quality to be used for Mineral Resource and Mineral Reserve estimation purposes.

11.11 Adequacy of Sample Preparation, Assaying, QA/QC, and Security

The qualified person for this section is not aware of the historic security measures in place at the time of the deposit delineation. However, the current core logging area is the same facility as was used during the delineation drilling. It is well removed from the mine site and a locked gate bars road access to anyone not authorized.

All samples were collected and prepared under the close supervision of a qualified geoscientist in a restricted core processing facility. The core samples were collected and transferred from the core boxes to high strength plastic sample bags then sealed. The sealed bags were then placed in steel drums and shipped under the Transport of Dangerous Goods regulations through the Cameco warehouse facilities at Cigar Lake directly to the laboratory.

The qualified person for this section is satisfied with all aspects of sample preparation and assaying. The sampling records are meticulously documented and samples were whole core assayed to reduce bias, although some ore intersections were sawn in half for display purposes. The assaying was done to a high standard and the QA/QC procedures employed by the laboratories were adequate.

The qualified person believes that the sample security was maintained throughout the process. Furthermore, the continuity and high grade nature of the ore zone has been confirmed from radiometric probing of closely spaced underground freezeholes and recent surface drilling results.

12 DATA VERIFICATION

The original database, which forms part of the database used for the current Mineral Resource and Mineral Reserve estimates, was compiled by previous operators. Many of the original signed assay certificates are available and have been reviewed by Cameco geologists. A total of 1,286 assays, representing 29% of the surface and underground drillhole results, were checked to confirm data integrity. One error (0.07 percent of the total reviewed) was found resulting from conversion from the % U_3O_8 value to the % U value.

Additional QA/QC measures taken on the data collected at Cigar Lake include:

- Surveyed drillhole collar coordinates and down hole deviations were entered into the database and visually validated and compared to the planned location of the holes.
- Using the Maptek Vulcan software package, a validation query was developed that checks for data entry errors such as overlapping intervals and out of range values.
- Downhole radiometric probing results were compared with radioactivity measurements made on the core and drilling depth measurements.
- Uranium grades based on radiometric probing were validated with sample assay results once available.

A discussion of the quality assurance and quality control measures undertaken, relating to assay and radiometric results, is included in Sections 11.7, 11.8, 11.10 and 11.11.

The qualified person for this section is satisfied with the quality of the data and considers it valid for use in the estimation of the Mineral Resources and Mineral Reserves.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Cigar Lake Processing Metallurgical Test Work

The design for processing ore at Cigar Lake has been largely based on the experience gained at McArthur River, including modifications and improvements incorporated since this operation was commissioned in early 2000. The primary difference between the two sites is that mining at McArthur River is carried out using dry methods, while mining will be done wet at Cigar Lake. As a result, coarse low density slurry will be pumped at Cigar Lake from the discharge of the mining machines to the underground ore storage facilities. Several pump and pipeline testing programs were conducted between 1996 and 1999 utilizing simulated Cigar Lake ore at SRC's Pipeline Research Center to establish design criteria for this system. The key findings from these test programs included the determination of minimum slurry velocities and practical pump box designs. In 2011, further pumping tests were done at the SRC Pipeline Research Centre to ensure that large, heavy particles can be transported by pipe line. The new mine plan calls for ore slurry to be pumped from the 480 m level to the top of the ore storage (a vertical distance of approximately 14 m). In the tests, different sizes, shapes and densities of particles were pumped in pipes that were sloped between 0 to 90 degrees. A report of these tests has been prepared by SRC.

In addition, wet crushing test work on simulated Cigar Lake ore was carried out in 1998 by Cron Metallurgical Engineering Ltd. on a prototype of a reduced size version of a Nordberg water flush cone crusher. Capacities exceeding 40 t/h were achieved on a maximum 75 mm feed to produce a product suitable for grinding in a ball mill.

In 2011, test work was performed at RMD Engineering on a dewatering/sizing system and a rock breaker to address the handling of a small stream of coarse materials produced by JBS units. The sizing system has been designed such that only ore greater than 50 mm will be fed to rock breaker. The rock breaker will ensure oversize ore will be reduced in size to less than 50 mm prior to pumping to ROM storage. Simulated Cigar Lake ore was utilized for these programs since the test facilities (located in Saskatoon) are not licensed to receive radioactive materials. In the case of the water flush cone crusher tests, the feed was prepared to a target size range utilizing a mixture of clay and coarse rock in gravel and high compressive strength cement. For the 1996 to 1999 SRC test work, slurries in the 1 to 4 wt% solids range were produced using solids consisting of clay, selected size fractions of rock, and various sizes and shapes of steel pieces. The 2011 SRC test work utilized a range of densities, shapes and sizes of metal pieces.

13.2 McClean Lake Processing Metallurgical Test Work

Extensive metallurgical test work was performed on core samples of Cigar Lake ore over a 7 year period from 1992 to 1999. This work has been used to design the McClean Lake JEB mill circuits relevant to Cigar Lake ore and associated modifications. Samples used for metallurgical test work may not be representative of the deposit as a whole. Additional sampling and metallurgical test work will be required to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation. This particularly applies to solids/liquids separation performance due to the nature of the solids characteristics upon completion of leaching.

The 1992-1999 work was performed in France at AREVA's (formerly Cogema) SEPA test center. The results of this test work have provided the core process criteria for the design of the additions and modifications required at the McClean Lake JEB mill for processing Cigar Lake ore. Variability in the ore feed and its potential effects on the process design and operation need to be established. In order to achieve this, metallurgical test work should be performed on representative samples of past and ongoing drillhole samples.

Based on the test results, an overall uranium recovery of 98.5% has been assumed. Anticipated losses are distributed as follows:

- Leach Residue Loss: 0.5%.
- Counter Current Decantation Soluble Loss: 0.7%.
- Solvent Extraction Loss: 0.3%.

This recovery is similar to that achieved at Cameco's other Saskatchewan operations. For reference, historically the Key Lake mill treating McArthur River mine ore achieves an overall recovery of approximately 98.7% and the Rabbit Lake mill treating Eagle Point mine ore achieves a recovery of approximately 97.0%. The lower recovery at the Rabbit Lake mill is due to the lower feed grade from the mine to the mill as compared to the McArthur River ore feeding the Key Lake mill.

For a further discussion of processing for the Cigar Lake project see Section 17 of this Technical Report. A high level operation flow sheet of the project ore processing activities is shown in *Figure 17-1*.

14 MINERAL RESOURCE ESTIMATES

A Mineral Resource model of the Phase 1/Phase 2* (collectively, referred to as Phase 1 in this Section) unconformity mineralization was created in 2011 using the latest drilling results and a re-interpretation of the mineralized envelopes. Methodologies, assumptions and parameters used to create the 2011 Mineral Resource model are described in this section.

The Phase 2 Mineral Resource model remains unchanged from the 2010 Technical Report.

14.1 Definitions

The Cigar Lake Mineral Resource estimates have been updated and reviewed by Cameco. Peer reviews have been conducted internally as well as externally by Cameco's CLJV partner AREVA. No independent verification of the current Mineral Resource estimate has been performed.

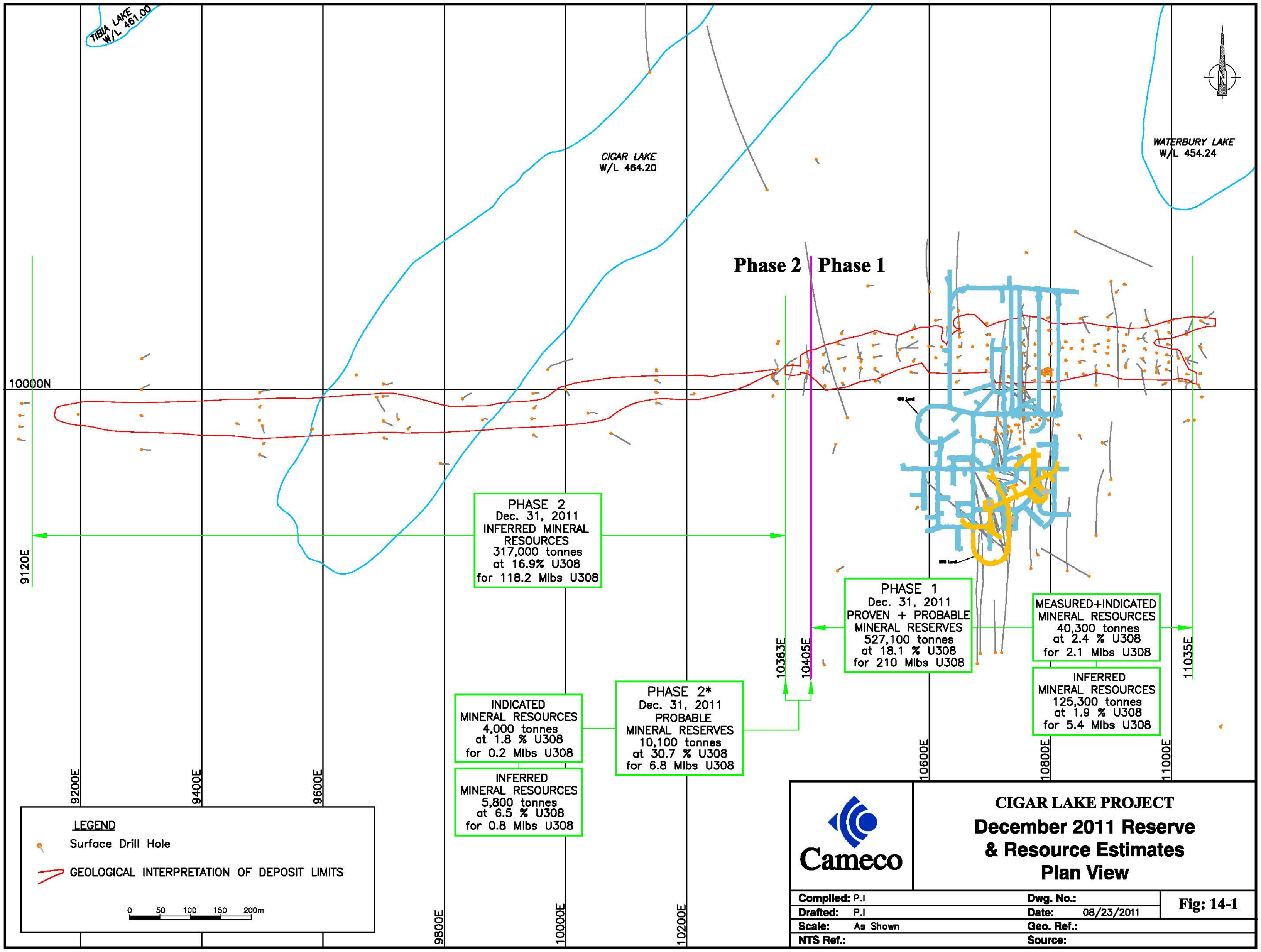
The Phase 1 Mineral Resources do not include allowances for dilution and mining recovery. The Phase 2 Mineral Resources include an allowance for dilution, as described below, but do not include allowances for mining recovery.

The classification of Mineral Resources and their subcategories conform to the definitions adopted by CIM Council on November 27, 2010, which are incorporated by reference in NI 43-101. Cameco reports Mineral Reserves and Mineral Resources separately. The amount of reported Mineral Resources does not include those amounts identified as Mineral Reserves. Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability.

14.2 Key Assumptions, Parameters and Methods

As illustrated in *Figure 14-1*, the known mineralization at Cigar Lake has been divided into two areas (defined by the JEB Toll Milling Agreement). The Phase 1 area extends from grid easting 10405E to grid easting 11035E. The Phase 2 area covers the western region between grid easting 9120E to 10405E. The 2010-2011 surface delineation program successfully extended Phase 1 mineralization onto the Phase 2 side of the project. These additional Mineral Resources and Mineral Reserves are identified as Phase 2* but have been estimated in precisely the same method as the Phase 1 Mineral Resources and Mineral Reserves.

Figure 14-1: Mineral Resource and Mineral Reserve Estimates – December 31, 2011



Uranium grades at Cigar Lake are extremely variable and range from hundreds of ppm to more than 80% U_3O_8 over a standard sample width. Grades were obtained from assaying drill core and checked against down-hole radiometric results. In areas of lost core or missing samples, reliance was placed on radiometric grades determined from probing. This version of the geological model also incorporates the grades of the underground freezeholes since the conversion of radiometric measurements to equivalent uranium grade has now been calculated for Cigar Lake type mineralization using recent chemical assays.

Where density was not directly measured for each sample, a correlation between uranium grade and density was applied (described in Section 11.9). The density of the samples varies widely, from about 1.3 g/cm^3 to more than 8 g/cm^3, due to the intensity of the alteration and the variable presence of the heavy minerals pitchblende, cobaltite, niccolite and others.

Geological Modelling

Phase 1

For Phase 1, a 3-dimensional model was created from the geological interpretation of mineralized domains using lithological, structural and uranium grade information. The interpretation was done on 12.5 m spaced vertical cross-sections and validated on plan views. Two stages of domaining were used to subdivide the wire frame model. The first stage divided the deposit into three pods: a high grade eastern pod; a high grade western pod; and a low grade central pod. These three pods are similar to historic models where it was recognized that there are significant grade variations along the strike of the deposit and these boundaries will constrain the influence of the high grade mineralization during the grade estimation process. The second stage of domaining subdivided the eastern and western pods into three parts each (as shown in *Figure 14-2*) that were based on geological constraints and grade continuity across strike. The central domains are considerably higher grade and tend to show better grade continuity while the north and south (flank) domains have greater grade variability and have isolated pockets of weak (below the 1.0% cut-off) mineralization. The grade and apparent continuity of the uranium mineralization is highest between approximately sections 10730E and 11010E.

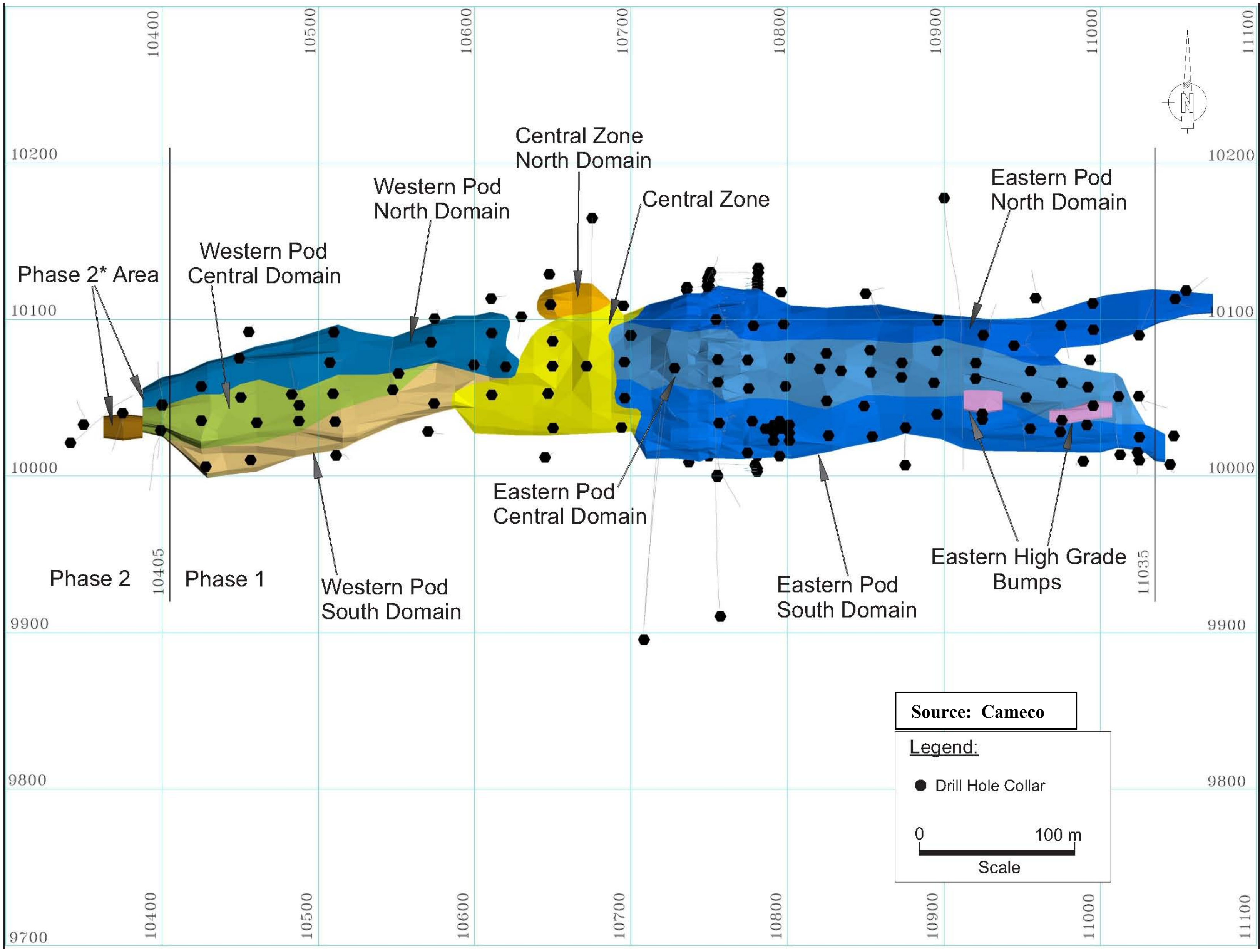
One metre mineralized drillhole composites were calculated within the wire frame models. No additional dilution from above or below the deposit was included in the composites. The cut-off grade used for defining the limits of the mineralization of the model is 1.0% U_3O_8 (minimum 1 m thick) vertically and 0.1% U_3O_8 horizontally. Composites of the mineralized intersections from surface and underground diamond drillholes and underground freezeholes form the database for this assessment.

Phase 2

For Phase 2, the 2-dimensional model is based on composites that incorporate an assumed minimum mineralization thickness of 2.5 m, a cut-off grade on the composites of 1.2% U_3O_8, and 0.5 m of external dilution at both the upper and lower limits of the ore intercept at zero grade. The horizontal limits of the deposit, interpreted at cut-offs of 3.0 m%U_3O_8 for grade x thickness ("GT") and 1.2% U_3O_8, were projected on a plan view.

Following completion of the current surface drill program (early-2012), Cameco plans to create a 3-dimensional block model for the Phase 2 area that will incorporate the latest geological interpretation and up-to-date structural model. The current Phase 2 Mineral Resource estimate is based on the existing 2-dimensional model.

Figure 14-2: Phase 1 Mineral Resource Model Domaining – Plan View



Block Modelling

Phase 1

A 3-dimensional model of Phase 1, based on the latest drillhole data, was created in 2011 using the Maptek Vulcan (Version 8.0) mining software. The Phase 1 area was defined by 369 drillholes (177 from surface and 192 from underground) of which 310 are mineralized (140 from surface and 170 from underground).

Variograms of the grade distributions were calculated within each domain, within each pod and using a high grade cut-off. Overall, the variograms were similar to historic results. However, the variography that focused on the high grades specifically (values >10% U_3O_8), indicated the need to limit their influence to approximately half the distance of the main search. Estimates of the D (density) and DG (density x grade) variables were obtained through using the ordinary kriging method for blocks of 4 m east-west x 4 m north-south x 1 m vertical with sub-blocks of 4 m x 1 m x 1 m, respectively. The block size is representative of the mining selectivity that will be achieved with the planned JBS cavity size. The estimated grade of each block was obtained by dividing DG by D.

Block models were validated using various estimation methods and multiple runs using different search parameters. The final model used a three stage estimation procedure with variable search box dimensions for each 3-dimensional wire frame. The three stage/search approach allowed the grade estimates of the blocks proximal to the drillholes to better mimic the composite grades of those holes before running the main search. For the central domains, the first search estimates blocks close to the drillholes using all grade values, the second search uses only grades between 0 and 10% U_3O_8 with a slightly expanded search to better represent the areas of low to moderate grade and the third search is the main block estimation search. For the flank domains: the first search estimates blocks close to the drillholes using values below 1% U_3O_8 to better represent the isolated zones below cut-off grade within the domains; the second search is the main block estimation search; and the third search estimates any remaining blocks. The main search distance used is 55 m east-west, 20 m north-south, and 7 m vertical while limiting the high grade values (>10% U_3O_8 within the flank domains and >60% U_3O_8 within the core domains) to an influence of 22 m by 10 m by 4 m. Only composites within each domain were used to estimate their respective domains. A summary of the 2011 search parameters compared with the previous parameters is shown in Table 14-1. This procedure honours the influence of both the low-grade and high-grade composites and reflects the grade variability of the deposit. The Phase 1 Mineral Resources do not include dilution or allowance for mining loss.

Table 14-1: Summary of 2011 Search Parameters compared with Previous Search Parameters

Central Domains	Previous	2011	Flank Domains	Previous	2011
Search 1			**Search 1**		
Major (m)	N/A	6	Major (m)	7	7
Semi-major (m)	N/A	4	Semi-major (m)	4	3.5
Minor (m)	N/A	0.6	Minor (m)	0.6	0.6
Grade Range (%U_3O_8)	N/A	0 - 100.0	Grade Range (%U_3O_8)	0 - 5.0	0 - 1.0
Limit (%U_3O_8)	N/A	No Limit	Limit (%U_3O_8)	No Limit	No Limit
Limit Range (m)	N/A	N/A	Limit Range (m)	N/A	N/A
# of samples	N/A	1 - 2	# of samples	1 - 2	1 - 2
Max. # of samples/hole	N/A	2	Max. # of samples/hole	2	2
Search 2			**Search 2 (Main)**		
Major (m)	7	11	Major (m)	60	55
Semi-major (m)	4	8	Semi-major (m)	15	20
Minor (m)	0.6	0.6	Minor (m)	2.5	7
Grade Range (%U_3O_8)	0 - 5.0	0 - 10.0	Grade Range (%U_3O_8)	0 - 100.0	0 - 100.0
Limit (%U_3O_8)	No Limit	No Limit	Limit (%U_3O_8)	No Limit	10.0
Limit Range (m)	N/A	N/A	Limit Range (m)	N/A	22 x 10 x 4
# of samples	1 - 2	1 - 2	# of samples	2 - 12	4 - 9
Max. # of samples/hole	2	2	Max. # of samples/hole	4	3
Search 3 (Main)			**Search 3**		
Major (m)	60	55	Major (m)	60	60
Semi-major (m)	15	20	Semi-major (m)	30	30
Minor (m)	2.5	7	Minor (m)	30	10
Grade Range (%U_3O_8)	0 - 100.0	0 - 100.0	Grade Range (%U_3O_8)	0 - 100.0	0 - 100.0
Limit (%U_3O_8)	No Limit	60.0	Limit (%U_3O_8)	11.0	10.0
Limit Range (m)	N/A	22 x 10 x 4	Limit Range (m)	60 x 15 x 2.5	22 x 10 x 4
# of samples	2 - 12	4 - 9	# of samples	2 - 12	2 - 9
Max. # of samples/hole	4	3	Max. # of samples/hole	4	9

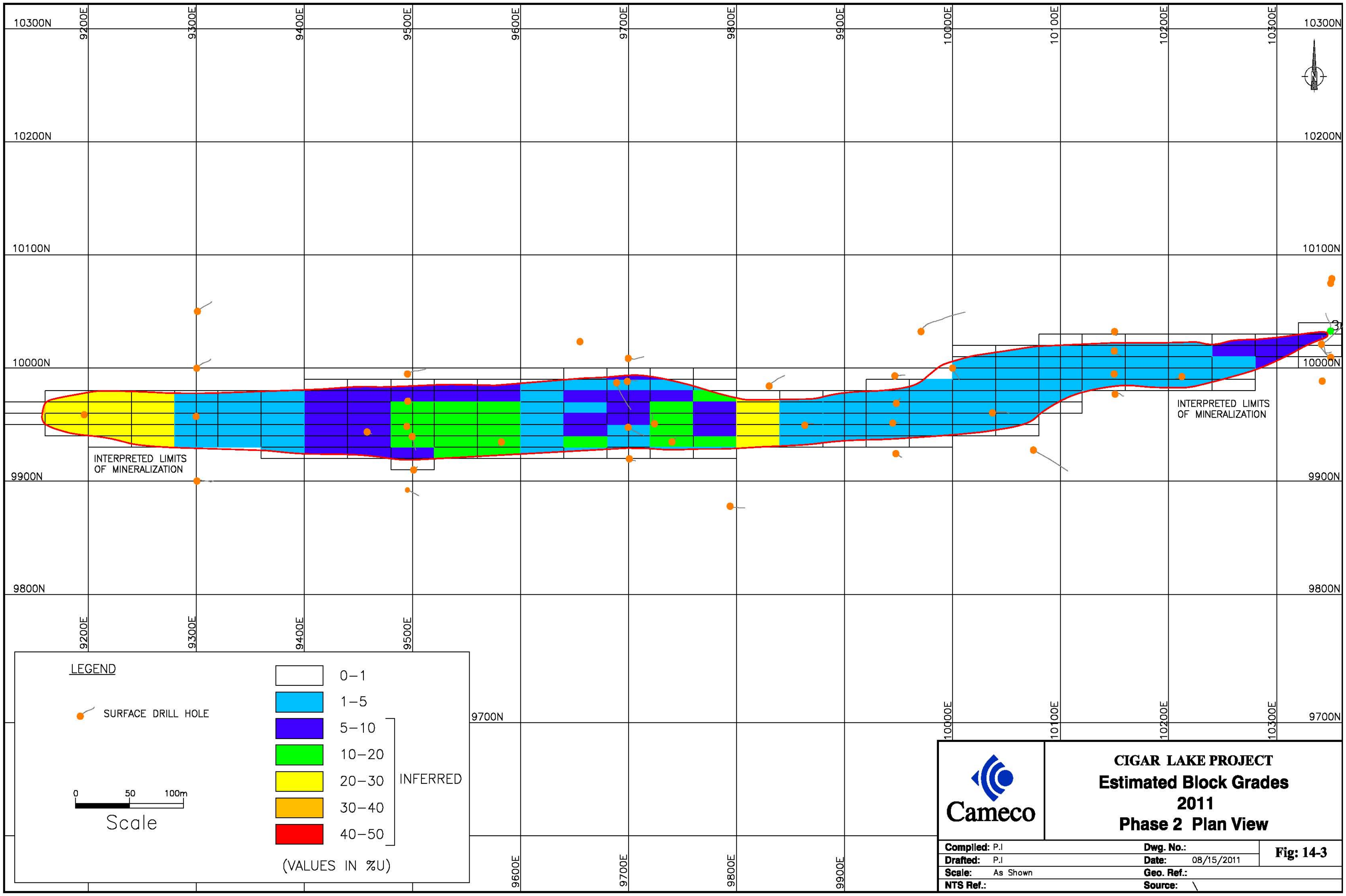
Phase 2

For Phase 2, results of a 2-dimensional modelling approach are reported. It was performed using the 1994 version of the SERMINE geological and geostatistical software package developed by AREVA. The Phase 2 area was defined by 19 mineralized drillholes. As discussed above, Cameco plans to create a 3-dimensional block model following completion of the current drilling program.

The variable ‘grade x thickness x density’ (GTD) represents the metal content on a "per unit area" basis. Two additional variables were estimated. They are: ‘thickness x density’ (TD), representing a tonnage per square metre, and the ‘thickness of mineralization’ (T). The estimated grade for each block was obtained by dividing GTD by TD.

Variograms of the three variables GTD, TD and T were calculated. No anisotropy was modelled in the plane of the mineralization. All three variograms show similarities in their ranges of continuity. Comparing all three variables, the variogram on GTD indicates the best continuity over distances of 20 m. In SERMINE, the search distances are a function of the block size. Given the drilling spacing at Phase 2, the block size was set to 40 m by 10 m. The search distances for Phase 2 were 100 m by 25 m. Ordinary kriging was used for interpolation within the interpreted outlines of mineralization. In the Phase 2 area, only blocks with an estimated grade at or above a cut-off grade of 5.9% U_3O_8 were retained as part of the Mineral Resources. This cut-off grade was established in 2000 at 5% U. It has not been reviewed since then because a lower cut-off is unlikely to materially affect the amount of Inferred Resources for Phase 2. As mentioned previously, Cameco is planning to update the Phase 2 Mineral Resource model in 2012 and the cut-off grade will be reviewed at that time. No limit on the grade-thickness was used. The resulting grade estimations for the Phase 2 block model are shown in *Figure 14-3*.

Figure 14-3: Phase 2 Mineral Resource Grade Distribution – Plan View – December 31, 2011



14.3 Mineral Resource Classification

The criteria for classification of the Mineral Resources are the levels of confidence on the geological interpretation and continuity of the uranium grade between sample locations, the estimation confidence and the drilling density. The criteria in general for each Mineral Resource confidence level are as follows:

Measured Resources: Detailed drillhole spacing (<25 m on average between drillholes along strike) supplemented by underground freezehole drilling (with assay or probing results) and have demonstrated both geological and grade continuity between drillholes (ie. no significant geological questions remain that could greatly alter the current interpretation).

Indicated Resources: Good drillhole spacing (25-50 m on average between drillholes along strike) supplemented by good geological continuity (ie. some geological questions remain that could alter the current interpretation but to a lesser degree) and moderate grade variability between drillhole intercepts.

Inferred Resources: Sparse drillhole spacing (>50 m on average between drillholes along strike) with poor geological continuity (ie. significant geological questions remain that could lead to large changes in the current interpretation) and a high degree of grade variability between drillhole intercepts.

Phase 1 Area

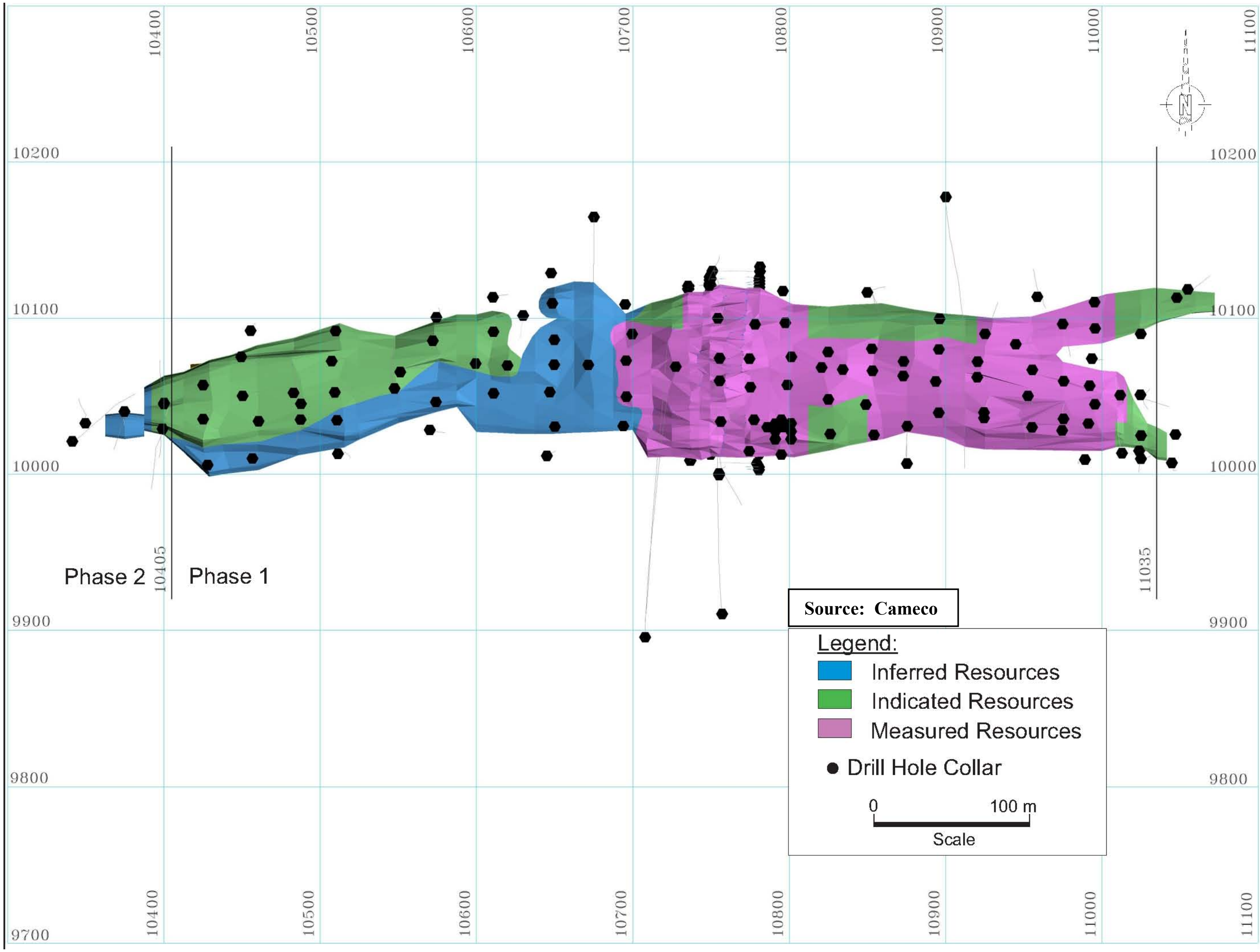
The distribution of Mineral Resource categories, before the application of modifying factors for conversion to Mineral Reserves, is shown in *Figure 14-4*.

The latest 3-dimensional modeling indicated that there has been an increase in the confidence of the resource in many areas which is reflected by the increase in proportion of Measured to Indicated Resources with regards to the previous model. However, uncertainties still remain in some areas in regards to the shape of the mineralized envelope and the continuity of the uranium grade.

Phase 2 Area

There is no change in the Mineral Resource estimate or classification for the Phase 2 area. In the Phase 2 area, only blocks with an estimated grade at or above a cut-off grade of 5.9% U_3O_8 were retained as part of the resources. No limit on the grade-thickness was used. On the basis of assumed grade and thickness continuity between the widely spaced drillholes (200 m by 20 m) supported by observations in the more densely drilled Phase 1, the estimated blocks of Phase 2 were classified as Inferred Mineral Resources.

Figure 14-4: Phase 1 Mineral Resource Classifications – Schematic Plan View



The Cigar Lake Mineral Resources, with an effective date of December 31, 2011, are presented in Table 14-2. Alain G. Mainville, P.Geo., of Cameco, is the qualified person within the meaning of NI 43-101 for the purpose of the Mineral Resource estimates.

Table 14-2: Summary of Mineral Resources – December 31, 2011

Category	Area	Total tonnes (x 1000)	Grade % U_3O_8	Total lbs U_3O_8 (millions)	Cameco's Share lbs U_3O_8 (millions)
		Measured and Indicated			
Measured	Phase 1	18.9	1.7	0.7	0.4
Indicated	Phase 1	21.4	2.9	1.4	0.7
Indicated	Phase 2*	4.0	1.8	0.2	0.1
Total Indicated		**25.5**	**2.7**	**1.5**	**0.8**
Total Measured + Indicated		**44.4**	**2.3**	**2.2**	**1.1**
		Inferred			
Inferred	Phase 1	125.3	1.9	5.4	2.7
Inferred	Phase 2*	5.8	6.5	0.8	0.4
Inferred	Phase 2	317.0	16.9	118.2	59.1
Total Inferred		**448.0**	**12.6**	**124.4**	**62.2**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of total Mineral Resources.
(3) Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

The updated 2011 Mineral Resource estimate reflects the changes mainly due to:

- An additional 49 surface delineation drillholes in portions of the Phase 1 area including 3 drillholes that extended the Phase 1 mineralization into the Phase 2 area described as Phase 2* Mineral Resources and Mineral Reserves;
- Incorporation of data for 182 historic underground freeze drillholes proximal to the rampup area that were recently updated with converted radiometric data;
- Re-interpretation of the mineralized envelopes of the Phase 1 area; and
- Reclassification of the Mineral Resources.

The Mineral Resource classification is based on the criteria laid out in Section 14.2. A summary of the changes in Mineral Resources is shown in Table 14-3.

Table 14-3: Changes in Mineral Resources

Category	Year-end 2010 Total tonnes (x 1000)	Year-end 2010 Grade % U_3O_8	Year-end 2010 Total lbs U_3O_8 (millions)	Year-end 2011 Total tonnes (x 1000)	Year-end 2011 Grade % U_3O_8	Year-end 2011 Total lbs U_3O_8 (millions)	Changes Total lbs U_3O_8 (millions)	Changes Cameco's Share lbs U_3O_8 (millions)
Measured	8.4	2.1	0.4	18.8	1.7	0.7	0.3	0.2
Indicated	15.6	2.4	0.8	25.5	2.7	1.5	0.7	0.4
Total Measured and Indicated	**24.0**	**2.3**	**1.2**	**44.4**	**2.3**	**2.2**	**1.0**	**0.5**
Inferred	480.4	12.6	133.6	448.0	12.6	124.4	(9.2)	(4.6)

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of total Mineral Resources.
(3) Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

14.4 Discussion on Factors Potentially Affecting the Mineral Resource Estimate Materially

In the Phase 2 area, where there is sparse drilling density, weaker geological continuity, and a high degree of uranium grade variability, drilling to date is not sufficient to represent this part of the deposit well enough to permit the classification of Indicated or Measured Mineral Resources. Current drilling in the Phase 2 area has potential to result in a significant increase or decrease of the Phase 2 Mineral Resources given the drillhole spacing and the ranges of influence applied during the last estimate.

The Cigar Lake drillhole database is considered to be very reliable. Any potential errors which may be present are not expected to cause any significant changes to the Mineral Resource model.

As is the case for most mining projects, the extent to which the estimate of Mineral Resources may be affected by metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues could vary from major gains to total losses. There are no known issues to the author of this section expected to materially affect the Mineral Resource estimate.

15 MINERAL RESERVE ESTIMATES

15.1 Definitions

The Cigar Lake Mineral Reserve estimate has been updated and reviewed by Cameco. Internal peer reviews have been conducted. No independent verification of the current Mineral Reserve estimate was performed.

The Mineral Reserves include allowances for dilution and mining recovery. Stated Mineral Reserves are derived from estimated quantities of mineralized material recoverable by a tested mining method. Mineral Reserves include material in place and stored on surface and underground. Only Mineral Reserves have demonstrated economic viability.

The classification of Mineral Reserves and the subcategories of each conform to the definitions adopted by CIM Council on November 27, 2010, which are incorporated by reference in NI 43-101.

15.2 Key Assumptions, Parameters and Methods

Mineral Reserves are based upon estimated quantities of uranium recoverable by the jet boring mining method combined with bulk freezing of the orebody. Jet boring produces an ore slurry with initial processing consisting of crushing and grinding underground at Cigar Lake followed by leaching and yellowcake production at the McClean Lake JEB mill.

The cut-off grade used to define the Mineral Reserve is based on the incremental cost of mining and mill processing to produce U_3O_8. Incremental mining cost was chosen over the full mining cost to define cut-off grade and was considered valid based on the following parameters:

- The lateral (E-W) extent of the mining zone was based on ensuring that the total costs to develop, freeze, mine and process the mineral were covered by the value of the uranium in that particular production panel.
- All remaining underground mining costs and all surface costs were considered as fixed, meaning that the same costs would be incurred regardless of production rate.

The incremental costs include jet boring costs, backfilling, underground crushing and grinding, ore slurry hoisting, trucking costs from Cigar Lake to the McClean Lake JEB mill and the cost of processing the ore slurry to final U_3O_8 (yellowcake).

A summary of economic factors used to derive the cut-off grade is shown in Table 15-1.

Table 15-1: Cut-off Grade Parameters

Uranium Price	US$61/lb
Exchange Rate	US$1.00 = Cdn$1.10
Mining Dilution	Variable for each cavity, based on 0.5 m of dilution material above and below the planned cavity, plus approximately 11%
Mine Recovery	90%
Process Recovery	98.5%

The value of the ore for the purposes of calculating cut-off grade represents the value from uranium only. Trace metals such as nickel, copper, cobalt and molybdenum are considered to have no economic value.

Based on the above factors, the calculated cut-off grade used to define the Mineral Reserves has been estimated at 2.0% U_3O_8 and has a minimum mineralization thickness of 1.5 m. These parameters are applied to the Mineral Resource block model after estimating the diluted grade of the JBS cavity.

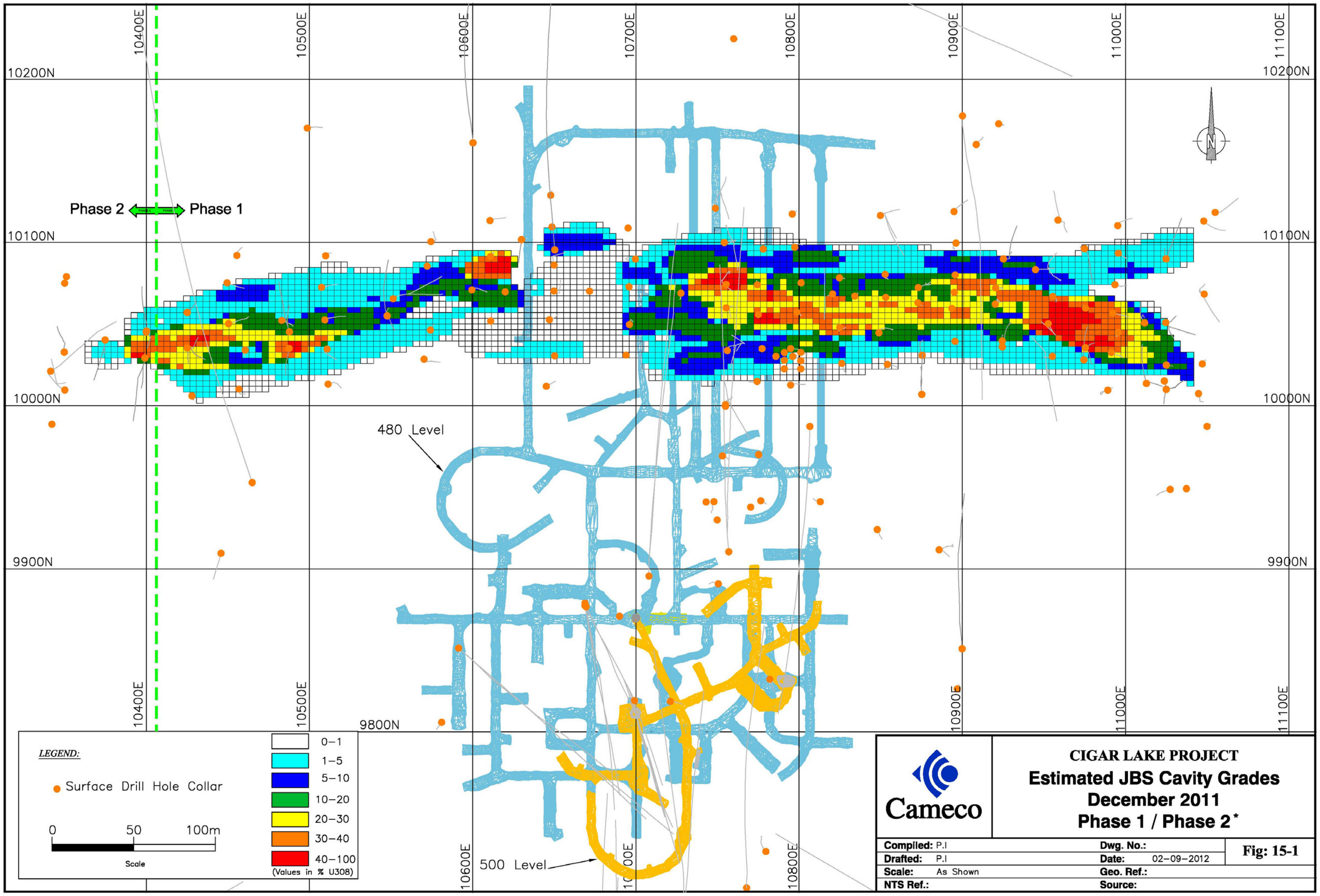
The diluted JBS cavity grades were estimated with an allowance of 0.5 m of dilution material above and below the planned cavity, plus approximately 11% external dilution at 0% U_3O_8. Mineral Reserves have been estimated based on 90% mining recovery. Dilution from JBS pilot holes, freeze drilling cuttings and concrete backfill are included as part of the 11% external dilution. *Figure 15-1* shows the grade distribution of the JBS cavities for the Phase 1/Phase 2* portion of the deposit before application of the cut-off grade and minimum thickness.

Mining rates are assumed to vary between 100 and 140 tonnes per day and a full mill production rate of approximately 18 million pounds of saleable U_3O_8 per year based on 98.5% mill recovery.

An average price of US$61.00/lb U_3O_8 was used to estimate the Mineral Reserves. The economic analysis confirms the production schedule has a positive cash flow over the life of the project.

In Cameco's Mineral Resource and Mineral Reserve table included in its annual information form for the year ended December 31, 2011 and annual management's discussion and analysis for the year ended December 31, 2011, a uranium price of US$58/lb with a fixed exchange rate of US$1.00 = Cdn$1.02 was used to estimate Mineral Reserves for each of Cameco's properties other than Cigar Lake. A sensitivity study of the Cigar Lake Mineral Reserves has shown that using an uranium price of US$58/lb with a US$1.00 = Cdn$1.02 fixed exchange rate, instead of US$61/lb U_3O_8 with a US$1.00 = Cdn$1.10 fixed exchange rate as in this technical report, changes the estimated total pounds by an insignificant amount.

Figure 15-1: Phase 1/Phase 2* Estimated JBS Cavity Grade Distribution – Plan View



Note: Before application of the cut-off grade and minimum thickness.

15.3 Mineral Reserves Estimation and Classification

In order to convert Mineral Resources to Mineral Reserves, a viable mine layout and realistic allowances for recovery and dilution must be applied. The mining cavity size and production criteria are listed in Section 16.3.3 and the mine layout is described in Sections 16.2.1, 16.2.2 and 16.2.4. The current mining project has been designed to extract the Mineral Reserves in Phase 1 and an immediately adjacent portion described as Phase 2*. Mineral Resources in the remainder of Phase 2 are in the Inferred Mineral Resource category. Further drilling and mining studies are needed before these Mineral Resources can be better evaluated.

The Mineral Reserves classification follows CIM definitions where economically mineable Measured and Indicated Resources can be converted to Proven and Probable Reserves, but Inferred Resources cannot be reported as Mineral Reserves. The Cigar Lake Mineral Reserves are defined by applying factors for mining recovery, dilution and minimum mineral thickness to the Indicated and Measured Resources. Mill recovery of 98.5% has been applied in the economic model. Mineral Reserve classification also uses a mining confidence factor, in addition to resource classification, to define Proven and Probable Mineral Reserves.

Mining recovery is estimated at 90% for both tonnes of ore and metal.

Hanging wall and footwall dilution, estimated at 0.5 m each, have been included in the dilution estimate along with backfill dilution. The rock cuttings from the jet boring casing holes will be directed to the ore stream rather than segregated as waste rock and will therefore also dilute the ore. Further, dilution from underground freezehole drilling cuttings has been estimated and added to the Mineral Reserves. This material, which will be directed into the ore stream, is assumed to have zero grade.

Following up on the recommendation from the 2010 Technical Report, the opportunity to eliminate the sump underflow material from the Mineral Reserves was assessed and changes were made to the mine design to remove this material from the mine without having to blend it with the ore. The operating costs and capital expenditures have been adjusted to accommodate this change in process. In total, nearly 42,000 tonnes of material at 0% grade has been removed and has contributed to the overall grade increase of the Mineral Reserves estimate.

The Cigar Lake Mineral Reserves estimates, with an effective date of December 31, 2011, are presented in Table 15-2. The mine plan for the project includes only the Mineral Reserves contained in Phase 1 and an immediately adjacent portion of Phase 2 described as Phase 2*. Alain G. Mainville, P.Geo., C. Scott Bishop, P.Eng. and Eric Paulsen, P.Eng., Pr.Eng. each of Cameco are the qualified persons within the meaning of NI 43-101 for the purpose of the Mineral Reserve estimates.

Table 15-2: Summary of Mineral Reserves – December 31, 2011

Category	Area	Total tonnes (x 1000)	Grade % U_3O_8	Total lbs U_3O_8 (millions)	Cameco's Share lbs U_3O_8 (millions)
Proven	Phase 1	233.6	22.3	114.9	57.5
Probable	Phase 1	293.5	14.7	95.1	47.5
Probable	Phase 2*	10.1	30.7	6.8	3.4
Total Probable		**303.5**	**15.2**	**101.8**	**50.9**
Total Reserves		**537.1**	**18.3**	**216.7**	**108.4**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of total Mineral Reserves.

The updated 2011 Mineral Reserve estimates reflect the changes mainly due to:

- Additional diamond drilling into portions of the Phase 1 area (including Phase 2*) and the addition of underground freezehole radiometric data;
- Re-interpretation of the mineralized envelopes of the Phase 1 area;
- Revised mine layout and dilution assumptions;
- Removal of sump underflow material from the Mineral Reserves;
- Reclassification of the Mineral Resources and Mineral Reserves;
- Updated mine operating cost estimates; and
- Metal price and exchange rate assumptions.

Compared to previous Mineral Reserves disclosed by Cameco, as of December 31, 2010, the 2011 Mineral Reserves increased from 209.3 million pounds to 216.7 million pounds. The review of the Mineral Resource and Reserve classification resulted in an upgrade in classification from Probable to Proven Mineral Reserves in terms of total contained pounds U_3O_8 (53% Proven/47% Probable in 2011 as compared to 35% Proven/65% Probable in 2010). The classification is based on drillhole spacing, geological and grade continuity, estimation confidence and the anticipated ability to successfully recover all of the ore. A summary of the changes in Mineral Reserves is shown in Table 15-3.

Table 15-3: Changes in Mineral Reserves

Category	Year-end 2010 Total tonnes (x 1000)	Year-end 2010 Grade % U_3O_8	Year-end 2010 Total lbs U_3O_8 (millions)	Year-end 2011 Total tonnes (x 1000)	Year-end 2011 Grade % U_3O_8	Year-end 2011 Total lbs U_3O_8 (millions)	Changes Total lbs U_3O_8 (millions)	Changes Cameco's Share lbs U_3O_8 (millions)
Proven	130.5	25.6	73.7	233.6	22.3	114.9	41.2	20.6
Probable	426.8	14.4	135.6	303.5	15.2	101.8	(33.8)	(16.9)
Total Proven and Probable	**557.3**	**17.0**	**209.3**	**537.1**	**18.3**	**216.7**	**7.4**	**3.7**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Totals may not add up due to rounding.
(2) Cameco's share is 50.025% of Total lbs U_3O_8.

Compared to previous estimate of Mineral Reserves disclosed by Cameco, as of December 31, 2010, the Mineral Reserves saw a decrease in tonnage of 4%, an increase in average grade of 8% and an increase of the estimated contained pounds by 4%.

15.4 Discussion on Factors Potentially Affecting the Mineral Reserves Estimate Materially

As is the case for most mining projects, the extent to which the estimate of Mineral Resources and Mineral Reserves may be affected by metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues could vary from major gains to total losses of Mineral Reserves. None of these issues that are known to the authors of this section, however, are expected to materially affect the Mineral Reserves estimate

The Cigar Lake drillhole database is considered to be very reliable. The largest area of uncertainty with the Mineral Reserve estimate is associated with mining and relate to the jet boring mining method, which has not previously been used on a large production scale basis. Values for factors such as recovery and dilution are unproven on a production basis at this time, although they are considered reasonable assumptions based upon test mine experience and the experience of the technical staff involved. Similarly, mining and production costs, which directly impact cut off grades, are undetermined on a production basis at this time. Nevertheless, it is considered that reasonable assumptions have been made in these areas.

The jet boring mining method and the overall mining and freezing plans for the Cigar Lake project have been developed specifically to mitigate the mining challenges, such as the low strength of the rock formation, the groundwater and the high level radiation, and to mine the deposit in a safe and economic manner. Unexpected geological or hydrological conditions or adverse mining conditions could lead to losses of Mineral Reserves. None of these issues that are known to the authors of this section, however, are expected to materially affect the Mineral Reserves estimate, but they could delay production and increase costs.

Over the years, Cameco and AREVA have developed expert knowledge and experience with the metallurgical treatment of uranium mineralization. Metallurgical test work has been completed on samples which may not be representative of the deposit as a whole. Additional sampling and metallurgical test work will be required to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation. None of these issues that are known to the authors of this section, however, are expected to materially affect the Mineral Reserves estimate

16 MINING METHODS

16.1 Design Parameters

This section describes the technical aspects of the planned underground mine, including geotechnical and hydrogeological parameters, test mining activities, selection of mining method, mine design, mine development requirements, mine production, backfilling and mine equipment requirements.

16.1.1 Geotechnical Characteristics of the Deposit

Two of the primary geotechnical challenges in constructing the mine are control of groundwater and ground support in areas of weak rock. These challenges occur in proximity to areas of massive mineralization in the overlaying saturated alteration zone, and within fracture zones in the sandstone and basement.

On the basis of the drilling and development during test mining and rock mechanics studies, eight geotechnically distinct zones have been identified at the orebody and mining elevations, the most challenging of which include the massive clay formation that hosts the ore, the extremely clay altered and fractured rock mass overlying the deposit, and the strongly altered rock mass that underlies the deposit. These zones are summarized in *Table 16-1*.

Table 16-1: Rock Geotechnical Classification

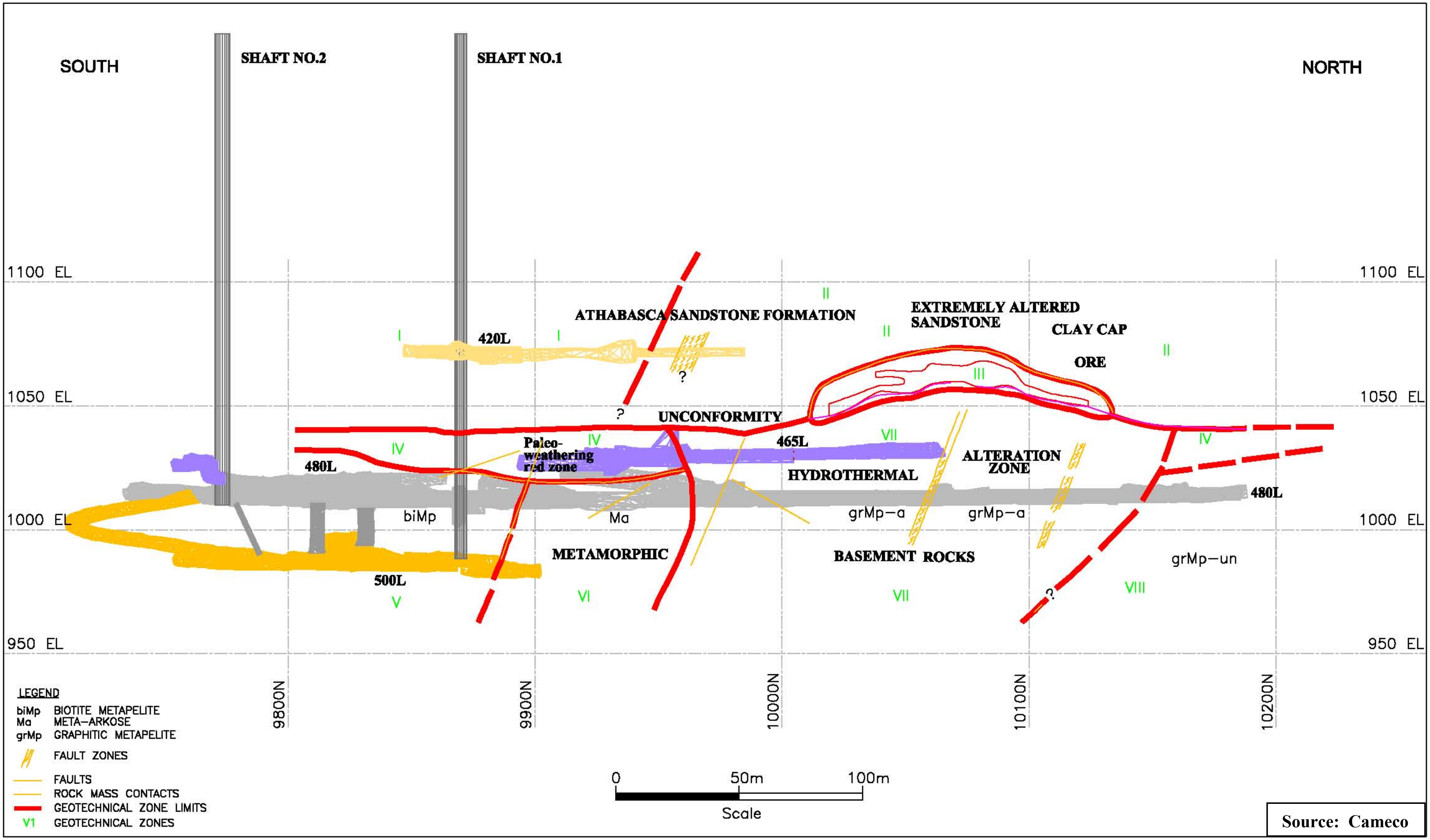
Geotechnical Zone	Name	Rock Quality	Rock Mass Classification MRMR[(1)] System
I	Sandstone – unaltered	Good to excellent	60-70
II	Sandstone - altered	Poor to extremely poor	<30
III	Ore zone & Clay Cap	Fair to poor	Not determined
IV	Regolith	Fair to good	<40
V	Biotite Metapelite	Good to excellent	41-70
VI	Meta-Arkose	Fair to very good	65-70
VII	Graphitic Metapelite – Altered	Extremely poor to good	5-50
VIII	Graphitic Metapelite – weakly altered	Fair to good	About 50

Note: (1) MRMR – Modified Rock Mass Rating

Geotechnical Zones I and II are found in the sandstone and lie above the deposit. Zone III is the ore deposit itself. Zones IV to VIII are all basement rocks and represent a large range of rock quality from Zone V "good to excellent" to "extremely poor to good" in Zone VII. The majority of future mine development will occur directly below the orebody in geotechnical Zone VII, where rock strength is in part very weak, varying considerably over distances as short as one metre. Within the basement rocks as a whole, ground conditions generally deteriorate and the degree of ground support required increases with increasing proximity to the mineralization and to the unconformity, in both the vertical and horizontal directions. Localized zones of poor ground can be encountered in the basement rocks away from the ore zone, and are generally associated with fault structures extending into the basement from the overlying sandstone. The ore is classified as Geotechnical Zone III and for which the overall rock mass strength is highly variable, ranging from very strong (massive pitchblende) to very weak in some clay facies, which are subject to squeezing and creep.

A typical section of the deposit and surrounding rocks showing the geotechnical classification of the various mining areas is shown in *Figure 16-1*.

Figure 16-1: Schematic Geotechnical Model of the Deposit – Looking West



The geotechnical model largely formed the basis of the mine plan including ground support guidelines, excavation methods and parameters, and freezing strategy. The model, ground excavation methods and ground support guidelines have been refined based on the earlier mining experience at Cigar Lake. The geotechnical model and mine plan was prepared with the assistance of a number of Canadian and international specialist geotechnical consultants through detailed investigations and analysis.

16.1.2 Hydrogeology

The deposit and sandstone are highly fractured. Post-mineralization fracturing is the dominant control of hydraulic conductivity and where it transects the otherwise impervious claystone core of the deposit, fracturing acts as conduits for water, sand and soft clay. The basement rocks are much tighter, with very minimal groundwater flow, although there are localized areas of poor ground conditions that are susceptible to higher rates.

Hydrogeological studies were completed by a consultant in conjunction with the geotechnical work. Generally, the geotechnical zone classification can be used to classify the hydrogeological properties. A 3-dimensional groundwater flow model was constructed based on the geological model developed from the data collected from geotechnical work and supplemented with structural information from geophysical data.

The most permeable zone occurs in the sandstones with Geotechnical Zone II being higher than that of Zone I. Within the basement rock masses the hydraulic conductivity is entirely fracture controlled and two to three orders of magnitude below that of sandstone, typically due to the tightness of the fracturing and the clay and chlorite alteration of the fracture surface, particularly in Zone VII.

As can be seen in *Figure 16-1*, Zone II lies directly on top of the unconformity in the areas surrounding the deposit. The primary risk associated with this geometry is the potential for high and uncontrolled groundwater inflow into the underground workings arising from mining activities, particularly:

- falls of ground that make connection with the overlying water bearing zones;
- holes drilled from the basement rocks that connect with the water bearing zones; and
- intersections of faults or areas of weak (highly permeable) ground connecting to the water bearing zones.

Three water inflows including the October 2006 inflow on the 465 m level, and the August 2008 inflow on the 420 m level, which resulted in the flooding of the mine, resulted in a re-evaluation and revision of the mine design and practices to minimize water inflow risk. The mine water management system is described in Section 16.2.9.

16.1.3 Test Mining Activities

Due to the complex geotechnical nature of the orebody and host rocks, test mining at Cigar Lake focused on an evaluation of mining and development methods and procedures, and to a much lesser extent on an evaluation of the geological characteristics of the orebody (e.g. grade and continuity of mineralization). Emphasis during test mining in ore was placed on the geomechanical and hydrogeological nature of the orebody with respect to developing a cost effective, efficient and safe method for mining of the ore. The test mining objectives included groundwater control, reduction of radiation and radon exposure, evaluation of ground stability and determining the potential ore recovery.

Underground in-situ mining tests in 1992 comparing the JBS mining method to other methods proved the potential of the method and provided the basis for the design and construction of a prototype jet boring system. A further series of in-situ mining field tests were then conducted in 1999 and 2000 and demonstrated the ability of the jet boring system to perform all production procedures in a timely and effective manner. Overall, the test mining programs were considered successful with the initial objectives achieved. An estimated total of 767 t of mineralized material grading on average 17.4% U_3O_8 was mined during the various mining tests.

In 1997, detailed engineering studies were undertaken for the purpose of developing a full feasibility study of the mining project. In addition, testing of a specially designed tunnel boring machine with the ability to install a reinforced concrete liner began. The mine development system (MDS) was tested and used successfully to develop two tunnels below the orebody.

The other major thrust of the test mining activities was the development and testing of two different non-entry mining methods: boxhole boring and jet boring.

The boxhole boring and the jet boring mining methods were both successfully field tested at Cigar Lake during the initial test mining program. Both methods were able to utilize a non-entry approach, as mining was conducted from headings located below the orebody. The ore was collected at the bottom of the access drillholes and contained within a cuttings collection system. Ground freezing stabilized the water saturated weak rock mass in which the orebody occurs and effectively prevented any possible inrush of ground water. Through the application of non-entry mining methods, the containment of the ore cuttings within cuttings collection systems, and the application of ground freezing, the levels of radiation exposure to workers were acceptable and below regulatory limits. Experience with non-entry raisebore mining of high grade uranium ore at Cameco’s McArthur River mine has demonstrated the effectiveness of this mining approach to manage radiation exposures.

Boxhole Boring

The boxhole boring test consisted of the vertical boring of two 1.5 m diameter holes into the ore. The dry material was allowed to fall through an enclosed chute arrangement into a specialized car. The material collected from the test was remotely transported to the shaft and removed to surface for storage. Approximately 53 t of ore with a grade of 17% U_3O_8 were mined with the boxhole boring mining method.

A small test of an expandable reamer assembly, as part of the modified boxhole boring system, was tested in waste. The access drillhole was 1.5 m diameter and the cavity created after deployment of the expandable reaming arm was 2.7 m diameter.

Jet Boring

The jet boring method utilizes a high energy water jet which rotates and oscillates within a remote cavity to mine the ore. This mining method was tested and refined at the Cigar Lake site in 1992, 1999 and 2000.

In 1992, initial tests consisted of three trials and demonstrated the potential of the method and its numerous benefits and provided the basis for the design and construction of a prototype jet boring system. Cavities approaching two metres in diameter were excavated in frozen ore even with the rudimentary, low powered system available at the time. Considerable engineering and laboratory/shop testing in the following years led to the development of a jet boring system consisting of high pressure pumps/piping, jet borer, jetting tools and slurry circuit.

In 1999, the Jet Boring Tools test involved the testing of a high pressure pumping system and engineered jetting tools in simulated ore in a culvert lined raise. The tools tested included nozzle sub, blade screen, and dual wall jetting pipes, swivel, fibreglass casing and preventor. The most significant results of these tests were the ability to excavate a cavity three meters in diameter (limited by the size of the culvert), the ability of the jet to mine 250 MPa material, the achievement of the predicted, average productivity rate of 7 to 10 t/h, and the ability of material to flow out of the cavity and through the preventor without plugging.

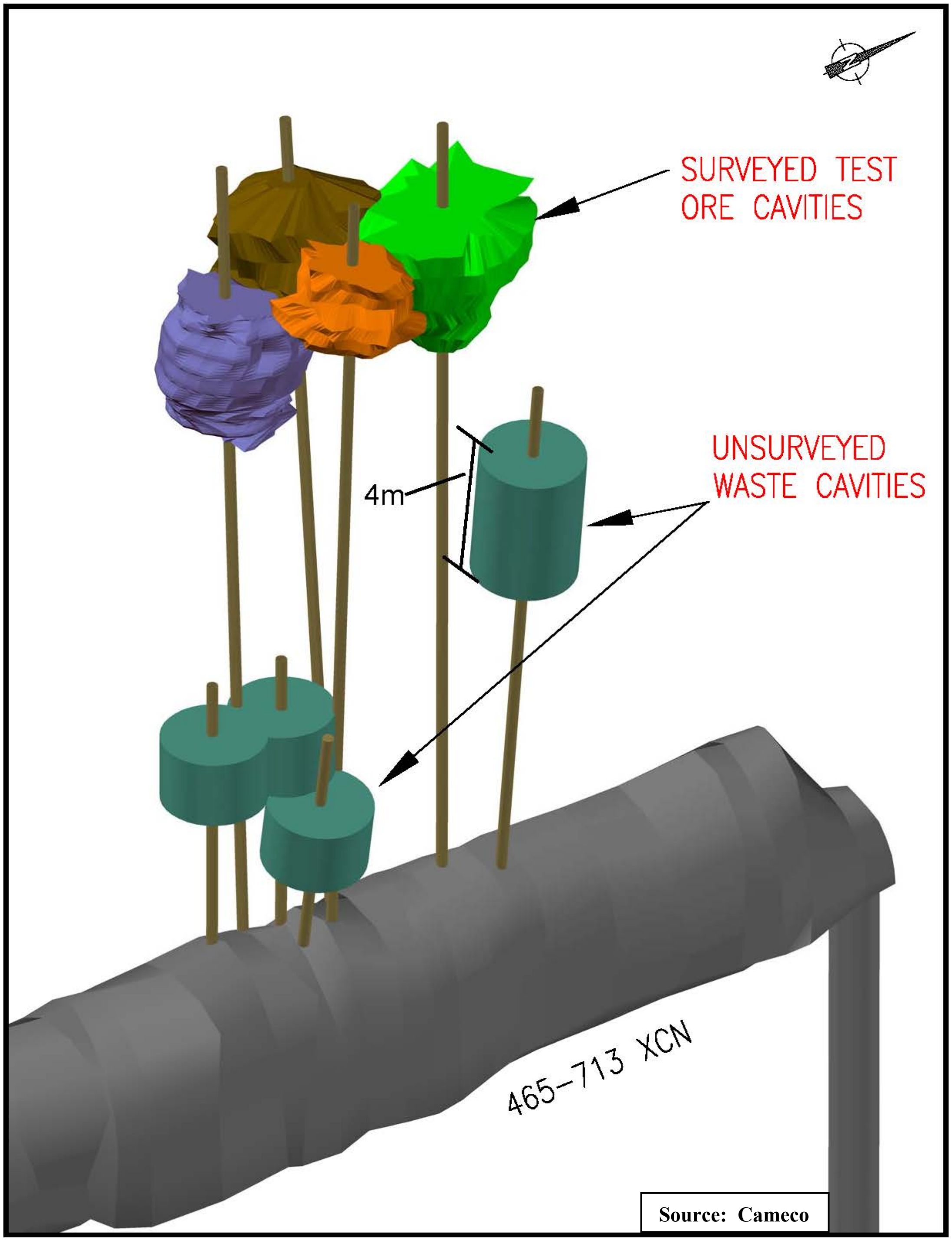
In 2000, a “Waste Test” was undertaken in a culvert lined raise and involved the testing of the jet borer drill car, cavity survey system and improved jet string tools. The tests demonstrated the ability of the jet borer drill car and controls to perform the jetting functions, the survivability of the cavity survey system and the improved performance of the jet string tools.

Also in 2000, the Jet Boring Systems (JBS) test involved the mining of cavities in frozen waste and ore using the complete prototype JBS and slurry circuit. The JBS, consisting of a drill car, two rod/casing cars, shuttle car and a slurry car, was set up in a culvert lined crosscut approximately 20 m below the ore. The slurry circuit tested included a slurry line from the slurry car to a cuttings storage sump and a recycle water line from the sump back to the slurry car. Four cavities were mined in waste rock below the ore and resulted in improvements to the jetting tools and procedures. Four cavities were also successfully mined in ore as shown in *Figure 16-2*.

In addition in 2000, the following tests were conducted successfully:

- Ore recovery from an underground slurry storage sump using a dredging clam bucket system,
- Mining cavity and casing hole surveying system, and
- Concrete cavity backfilling

Figure 16-2: Jet Boring Test From 2000 – Three Dimensional View – Looking Northwest



Source: Cameco

Jet Boring System Test Results

The JBS test demonstrated the ability of the entire jet boring system to perform all production procedures in a timely and effective manner. Approximately 600 t of ore was mined in four cavities during the 2000 test. A table showing the details of the ore mined in each cavity is included in Section 6.4. The results of the test were:

- The ability to excavate roughly circular cavities with an average diameter of more than four metres, without attempting any optimization.
- The achievement of an average productivity rate of 7 to 10 t/h while jetting.
- Cycle times were determined to be approximately 152 hours for the four test cavities mined in ore. This factor has since been revised to 160 hours reflecting changes to the mining horizon and other process changes.
- The ability of the ore to flow from the cavity, through the preventor and slurry car, and pumping of the ore slurry down the pipeline to the storage facility.
- The ability to use 40 MPa concrete as backfill and its ability to withstand jetting from an adjacent cavity.
- The reliability of all equipment meeting or exceeding expectations.

Following the completion of the test mining programs, the jet boring method was selected over boxhole boring as the safest and most viable economic method of mining in the Phase 1 area of the orebody. Overall, the test mining programs were considered successful with the initial objectives achieved. An estimated total of 767 t of mineralized material grading on average 17.4% U_3O_8 was mined during the various mining tests.

Although Cameco has successfully demonstrated the JBS mining method in trials, this method has not been proven at full production. Test mining trials have been completed on a limited number of cavities that may not be representative of the deposit as a whole. As Cameco ramps up production, there may be some technical challenges, which could affect Cameco’s production plans, including, but not limited to variable or unanticipated ground conditions, ground movement and cave ins, water inflows and variable dilution, recovery values and mining productivity.

16.2 Mine Design

16.2.1 Overview

Underground facilities and services required for the mine during operations will generally include:

- two service shafts for mine access and ventilation;

- access drifts and MDS crosscuts;
- ground freezing infrastructure and equipment;
- ore processing facilities; and
- support facilities including maintenance shop, electrical substations, sumps, pump stations and storage areas.

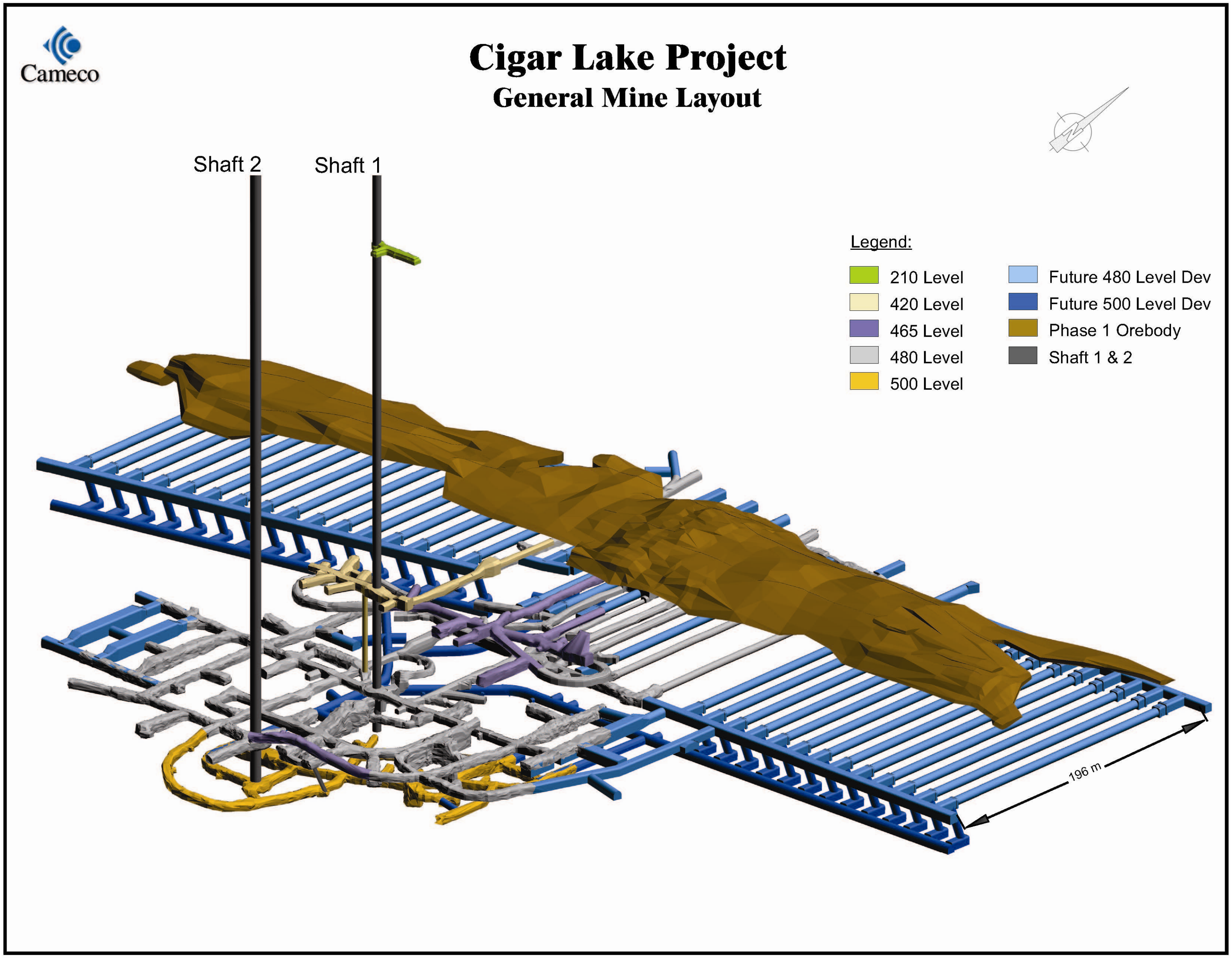
The orebody will be mined using a series of crosscuts and access drifts on the 480 m level. A strategy of bulk freezing the orebody has been adopted to minimize the risk of large water inflows, control radiation resulting from radon being released from flowing water, and increase the strength of the rock to be mined. Freezing will initially be undertaken from both the 480 m level and from surface. Once the ground for the initial production panels are frozen from surface, continued ground freezing activities are planned to be conducted from underground. All production mining is planned to occur from the 480 m level using the jet boring mining method.

Mined ore from the jet bore units will be pumped to the ROM ore receiving facility on the 480 m level. From there, the ore is put through an underground crushing, grinding and clarification circuit before being pumped to surface through one of two ore slurry pipe lines to be installed in Shaft No. 2. More details about the ore processing can be found in Section 17.

Figure 16-3 provides a 3-dimensional view of the existing and planned development for the Cigar Lake mine. The layout is a function of the jet boring method and the need to freeze the orebody due to ground conditions and groundwater and radon control issues. The layout is also a function of overall ventilation, radiation protection and support services requirements.

The following subsections describe in more detail the infrastructure and development activities planned as part of the project completion.

Figure 16-3: Three Dimensional General Mine Layout – Looking Northwest



16.2.2 Mine Access

Shaft No. 1 currently provides access to the underground mine workings and will serve as the main service and access shaft during construction and production and as a route for delivery of fresh air underground. It extends from surface to a depth of 500 m and provides direct access to the 480 m level. The level number is the approximate depth of that level below surface in meters. Shaft No. 1 is circular, concrete lined with a hydrostatic liner, and has an internal diameter of 4.9 m. A drift connecting the shaft bottom and 500 m level facilitates maintenance and removal of spillage from waste rock hoisting.

Shaft No. 2 is located approximately 90 m south of Shaft No. 1 and will be completed to a planned depth of 500 m. It is a circular shaft with an internal finished diameter of 6.1 m. The shaft has a non-hydrostatic concrete liner to a depth of approximately 368 m and will have a non-hydrostatic liner between the 480 m and 500 m levels. The remainder of the shaft between the 368 m depth and the 480 m level is being constructed with a hydrostatic liner comprised of cast-iron tubbing, which has been successfully used in other mines including Saskatchewan's potash mines. As of early January 2012, Shaft No. 2 has been completed to a depth of 480 m. Sinking to the 500 m depth, followed by shaft furnishing, remains to be completed.

Shaft No. 2 will provide access for personnel and materials to 480 m level. Shaft services will include ore slurry pipes, concrete slick lines, power cables and a communication cable. To supplement underground fresh air requirements and permit removal of mine exhaust air, Shaft No. 2 will be constructed with a central airtight partition which will divide the shaft into two independent compartments. One compartment will serve as the main path for exhaust air from the mine; and the second will be used to downcast additional fresh air as well as house the service cage to be used for secondary egress. Commissioning of the Shaft No. 2 ventilation system is planned to be completed in support of production.

16.2.3 Mine Development

There are two main levels in the mine: the 480 and 500 m levels. Both levels are located in the basement rocks below the unconformity. The 420 m level, located in the sandstone above the basement rock, no longer has a use in the updated mine plan and has been backfilled to reduce the likelihood of another inflow event similar to that of August, 2008. The 465 m level is also no longer required as part of the mine plan, and has been backfilled to reduce the likelihood of further ground failure or inflow on that horizon.

The 480 m level provides access to the production area below the orebody, and is typically more than 25 m below the ore zone. Mine development to the south of Shaft No. 1 provides access to Shaft No. 2, the ore recovery and reclaim water facilities, the clarifier and the clarifier underflow pachuca. The main underground processing and infrastructure facilities are located on this level. These facilities will consist of the heat exchanger room, high pressure pump room, warehouse, backfill loading station, laboratory, electrical rooms and maintenance shops. In addition, the main mine dewatering pump station and associated electrical facilities have been constructed on this level. The main brine pipeline to the underground is planned to be extended in Shaft No. 1 to the 480 m level. The brine mains are currently routed through the backfilled area of the 420 m level, and are operating effectively.

In the production area of the 480 m level, access drifts will be extended on the north and south sides of the orebody. Additional MDS tunnels will be developed on 16 m centres in a north-south orientation to facilitate JBS production and underground freeze drilling. Various storage facilities for mine production equipment will also be excavated off the north access drift.

The 500 m level is accessed via a ramp from the 480 m level. Planned facilities on the 500 m level include the recycled water tank, ball mill, base of the clarifier underflow (U/F) pachuca and the ore slurry hoisting pump. Excavation has been completed for these facilities, and construction of these facilities has been initiated. A heading has been excavated from the 500 m level Shaft No. 1 access drift to the new main mine sump, providing for expanded sump capacity and ease of operation and maintenance of the mine dewatering system. The main ventilation exhaust drift for the mine is located on this level, and development of this drift is in progress.

16.2.4 Development Requirement During Construction and Operation

Excavations still required to be completed prior to start of production include:

- 480 high pressure pump room;
- 480 m level shops;
- 480 m level ventilation and piping services drift;
- north and south access drift extensions on the 480 m level;
- two additional MDS crosscuts on the 480 m level;
- various storage and service areas on the 480 m level;
- 500 m level exhaust ventilation drifts; and
- exhaust ventilation raises between the 480 and 500 m levels.

In total, more than 13,000 m of lateral and vertical excavation (excluding the Shaft No. 2) is planned to be developed over the life of the mine. As of December 31, 2011, approximately 3,900 m of development has been completed, leaving an additional 1,600 m required prior to initial production. Additional development requirements have been identified in the updated mine design, and they are included in these quantities. The majority of the excavation work will be sited on the 480 and 500 m levels, which together represent the main operating area of the mine.

16.2.5 Excavation and Ground Support Methods

Mine development for construction and operation uses two basic development approaches: drill and blast with conventional ground support, and the Mine Development System (MDS), a 5.1 m diameter full face tunnel boring machine, which installs a precast concrete tunnel lining for ground support. Use of a roadheader excavator is under evaluation for those areas of weak ground away from the orebody.

With the exception of the MDS headings, the infrastructure excavations and the access drifts are being developed using conventional drill and blast mining methods. Geotechnical drilling and analysis of ground conditions is completed prior to confirming permanent infrastructure locations.

Cameco plans its mine development to take place away from known groundwater sources whenever possible. In addition, Cameco assesses all planned mine development for relative risk and applies extensive additional technical and operating controls for all higher risk development.

Conventional Drill and Blast Development

A drill and blast method, utilizing full face advance, is being applied in the competent ground, primarily for access drifts surrounding the orebody and for infrastructure excavations. Grouted rebar and shotcrete are used as the primary support system. Wire mesh and straps are used locally, as required. Rockbolt spacing and shotcrete thickness vary with localized ground conditions. Spiling installed ahead of the excavation is used locally in poor ground. Cable bolts, typically 5 m in length, are also being installed in the back of large excavations, such as the clarifier and ball mill room, as well as at most intersections. Modified excavation techniques or additional ground support, such as steel arches, will be applied in areas of poor ground conditions in the access drifts.

Mine Development System (MDS)

One of the features of the MDS is that it provides continuous temporary ground support during excavation and almost immediate installation of permanent ground support after excavation. This feature is critical for development in areas of poor ground conditions underneath the orebody where there is minimal stand-up time.

The MDS excavates a 5.1 m diameter heading with a finished inside diameter of 4.25 m. The annular space between the liner and rock mass is filled with grout. Six concrete segments are required for each metre of crosscut advance. During the test mining period, two crosscuts were completed on the 480 m level and one crosscut was partially completed on the 465 m level using the MDS. Since that time two additional crosscuts have been excavated on the 480 m level.

In 2011, Cameco identified some spalling and cracking of the tunnel segments in a short section of one of the crosscuts that was excavated in 1999. Cameco has taken steps to halt the deterioration and has reinforced the affected area. Cameco retained two geotechnical consultants to provide advice on the need for any possible further tunnel reinforcement. Based on the recommendations of these consultants, some minor revisions may be required to modify the life-of-mine plan or segment design to ensure that the portion of the Mineral Reserves to be mined from this tunnel section are not negatively impacted, and that similar conditions will not arise elsewhere. At this time, there is no impact from this tunnel deterioration anticipated on the initial production, however, Cameco does need to take some action to ensure the production rampup schedule is maintained. The consultants' reports are expected to be completed early in 2012.

A unique feature of the MDS for Cigar Lake is the performance requirement for the tunnel liner segments. These segments are constructed using a very high strength concrete, currently greater than 100 MPa. To date, Cameco has used western Canadian commercial suppliers of pre-cast concrete to supply the segments. Cameco has most of the segments in inventory required for the two tunnels to be excavated during construction. Procurement of the remaining segments will be done through a western Canadian suppler. No delays are expected to the project schedule. For ongoing procurement of tunnel segments during mine operation, Cameco intends to enter into a commercial agreement with a northern Saskatchewan supplier.

16.2.6 Ground Freezing

Test mining experience and modelling studies have demonstrated the advantages of ground freezing over other potential ground conditioning methods. These advantages include stabilizing and strengthening the weak ore and the surrounding ground, minimization of ground water inflows while mining, and attenuation of radon release. The ground to be frozen includes the ore body, the weak, water bearing sandstone above the ore, as well as a zone extending both laterally away from the orebody and beneath it.

The freezing strategy is to bulk freeze the ore zone and the surrounding area, as noted above, prior to start of mining in a given area. Temperature holes installed in the area to be frozen are used to determine when the ground has reached its required temperature. Where required, the ground above the MDS tunnels may be frozen prior to MDS development as there is a potential risk of inflow from historical unsecured surface diamond drillholes. Localized ground freezing may also be used to allow development of access drifts to take place in areas of weak ground away from the orebody.

Cameco plans to use a hybrid freezing approach in the early part of the mine life. It plans to use surface freezing to freeze the ground for the initial four to five production panels, and then transition to lower-cost underground freezing for the remainder of the planned mine life.

Freeze System

The ground freezing system consists of an ammonia refrigeration plant on surface used for both the surface and underground freeze systems, a surface and underground brine distribution piping system and in-situ freeze pipes. The freeze plant has a capacity of approximately 900 tons refrigerant. For the underground freeze system, calcium chloride brine at approximately minus 40 °C is circulated underground through 300 mm diameter insulated pipes installed in Shaft No. 1. The brine is received by heat exchangers underground which in turn cools the brine circulated through the freeze pipes installed in the freezeholes. This system freezes the deposit and surrounding rock to between minus 10 °C and 20 °C in one to three years, depending on freeze pipe geometry and ground properties such as water content, thermal conductivity, etc. The underground freeze system is currently operating.

For the surface freeze system, the calcium chloride brine is circulated to the collars of the freezeholes from the freeze plant via insulated pipes in an overhead pipe rack. As of December 31, 2011, 41 of a planned 250 holes have been drilled, and outfitting of the holes with brine circulation tubes was in progress. Installation of the surface brine distribution piping is substantially complete. Ground freezing in some of these new holes was initiated in late December 2011.

Freezing From Underground

Orebody ground freezing activities are conducted from beneath the ore zone on the 480 m level in tunnels typically referred to as freeze cross-cuts. Ground freezing is accomplished by drilling holes from the freeze cross-cuts to a minimum of 15 m above the ore zone using specially designed drills, although the holes drilled prior to the 2006 mine flood were only drilled to approximately 10 m above the ore zone. Holes are generally drilled on a 2 m by 11 m pattern, although tighter spacing can be used to help reduced the time required to freeze the ground. The freeze cross-cuts are planned to be nominally spaced 48 m apart, although optimization and operating experience over the life of the mine may drive changes to this proposed design. The typical JBS and freezehole arrangement is shown in *Figure 16- 4*.

Prior to drilling each hole, a standpipe or casing is installed in the hole collar to support the preventor system. The preventor system is installed to secure the hole in the event that water is intersected while drilling. The rods used to drill the hole are left in place and become used as the freeze pipes. This configuration is the same as that used successfully at Cigar Lake prior to the mine flooding in 2006, and is similar to the system in use at the McArthur River mine to conduct ground freezing.

Temperature monitoring holes are also drilled from the underground freeze cross-cuts approximately every 6 to 12 m, to measure ground temperatures and indicate the progress of freezing.

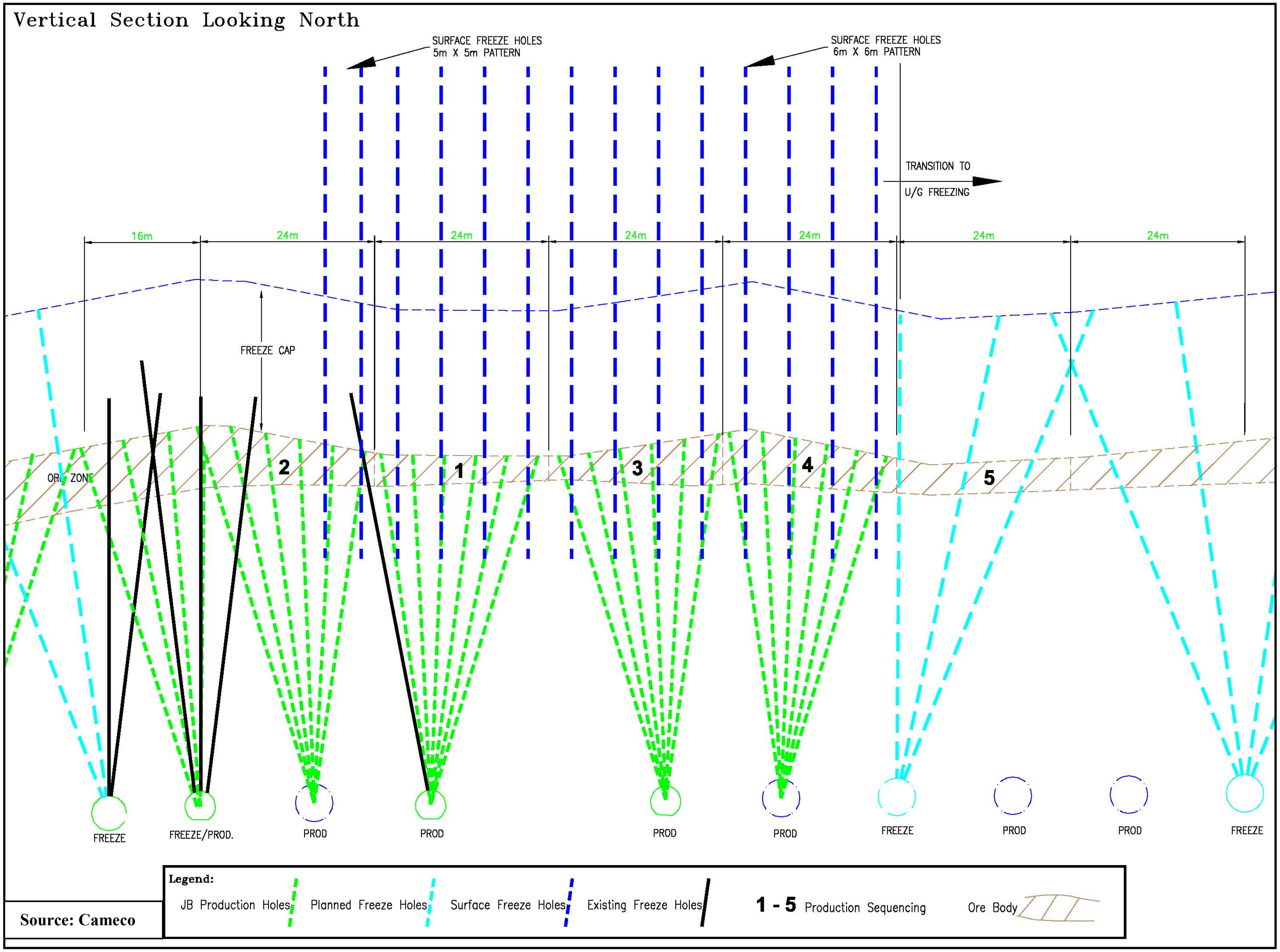
Freezing From Surface

Based on the results of the surface freeze test program completed at Cigar Lake in 2010, Cameco began to implement ground freezing from surface for a portion of the overall project. Approximately 250 freeze and temperature holes will be drilled for the purpose of freezing the first four production panels. The expected benefits to the project by implementing this strategy include:

- reducing the risk to the construction schedule in two ways:
  - (1) the surface freeze process can start before developing the underground tunnels; and
  - (2) the construction activities underground are simplified by moving some of the related freezing activities and infrastructure to surface; and
- contributing positively to the overall project economics.

Freeze and temperature holes will be drilled initially on a 5 m x 5 m pattern, expanding to possibly 6 m x 6 m for production panels #3 and #4. Drilling is currently in progress using diamond drills, although other drill rigs may be used in an attempt to improve drilling costs and productivities. Holes are being drilled to a depth of 465 m, which is approximately 15 m below the bottom of the ore zone. A freeze isolation packer will be installed at a depth of approximately 400 m, to allow ground freezing to take place only in the bottom portion of the hole.

Figure 16-4: JBS and Freezehole Arrangement – Schematic Vertical Section Looking North



16.2.7 Ventilation

The mine ventilation system has been designed to supply fresh air to the working areas, remove contaminated air from the mine and to reduce the potential for radon gas build-up.

The primary ventilation system has been designed to supply a volume of up to 240 m^3/s of fresh air to the mine. The primary ventilation fans have already been installed, and are comprised of three 800 HP fans on surface at Shaft No. 2. These fans will draw contaminated mine air up through the exhaust compartment in that shaft. The second compartment in Shaft No. 2 will intake fresh air to the mine and for this service three 200 HP fans and a mine air heater have been installed. Shaft No. 1 will be another fresh air intake to the mine and is equipped with a mine air heater and two associated 60 HP fans. As part of a planned upgrade prior to start of production, two new mine air heaters and two new 200 HP intake fans will replace the existing heaters and intake fans.

The mine air heaters will be used during the winter months to heat the ventilating air to approximately plus 5 °C. The heaters are direct fired propane heaters installed at the ventilation intake locations at both Shaft No. 1 and Shaft No. 2.

The auxiliary ventilation system will draw airflow from the primary circuit and, through the use of fans and vent ducting, will provide appropriate ventilation to the production and development headings and other work areas and facilities.

Local extraction systems to remove potentially contaminated air will be established at a number of locations as part of the secondary ventilation system. Once captured inside a duct, the radon contaminated air will be discharged directly into a dedicated exhaust drift or raise or ducted directly into Shaft No. 2 and subsequently discharged to surface.

The designed mine ventilation volume of 240 m^3/s is anticipated to provide sufficient airflow through the mine for use of diesel equipment and radiation protection at a sustained production rate of approximately 18 million pounds per year U_3O_8. Should this volume of air prove inadequate for radiation protection at the designed production rate, the rate of production would be negatively impacted without additional capital expenditure to increase the ventilation throughput.

16.2.8 Mining Equipment

The mining equipment list reflects the planned mining equipment requirements for mine operation and production. All of the mine equipment for mine operation is expected to be owned by Cameco with the possible exception being the freeze drills. Contractor's mining equipment will augment the Cameco fleet during mine development and construction and the capital and operating cost estimates reflect this.

Production related mining equipment will be comprised of four JBS units supported with two concrete pumps for backfilling purposes. Ongoing mine development will be completed using conventional drilling and blasting equipment for access drifts, and a tunnel boring machine (MDS) for tunnels beneath the ore zone. Cameco is considering purchasing a roadheader unit for access drift development in poor ground conditions; the costs to purchase and operate the machine are reflected in the life-of-mine operating cost estimate.

During mine operation, all freeze drilling is planned to be done from underground. A fleet of up to six freeze drills will be required to ensure freeze drilling and ground freezing is completed sufficiently ahead of planned mining activities.

Other mining equipment, such as scissor lifts and utility vehicles, will be used to support the mine development and production activities.

Table 16-2 shows a list of the key underground mining equipment that is planned to be used for development and production.

Table 16-2: Underground Mining Equipment

Description	Number Units
Freeze Drills	6
Jet Boring Units	4
MDS Units	1
Roadheader	1*
Grout Plant for MDS	1
Scooptrams (various sizes)	3
Electric Hydraulic Jumbo Drill	2
Rock Bolting Rig	1
Scissor Lift Truck	1
Concrete Pump – for backfill	2
Shotcrete Machine	1
Concrete Transmixer Truck	1
Utility Vehicle/ Bobcat	4
ANFO Loader	1

* Use of the roadheader unit is currently in the evaluation stage, but is included in the cost estimate in the life-of-mine plan.

16.2.9 Mine Water Management

A mine water handling strategy has been developed that includes increasing the mine's water-handling capabilities for future routine and potential non-routine inflows above the existing capability previously assessed by Cameco (2004) in the Cigar Lake Project Environmental Assessment Study Report (EASR). In addition to treating all routine water inflows (seepage and process water) prior to releasing to the environment, water from any non-routine inflow will also be treated prior to releasing to the environment until such time as the inflow can be mitigated at the source. Cameco submitted a screening level environmental assessment to discharge all treated effluent (except sewage) through two pipelines directly to a single location in Seru Bay of Waterbury Lake, and a positive decision was received in 2011. Construction of the facility is in progress, and is scheduled for completion in mid-2012. Permission to operate the facility is still required, but cannot be obtained until construction is complete and the facility has been fully commissioned. An environmental monitoring program will be in place prior to operating the facility.

In order to be able to respond quickly and efficiently to any potential future mine inflow, staff at Cigar Lake have prepared a comprehensive document containing a number of water inflow planning scenarios. The document contains information on equipment, material and personnel required to deal with various inflow scenarios, as well as suggested sequences of activities to deal with different inflow scenarios in different locations of the mine.

Bulkhead doors are no longer part of the mine inflow management strategy at Cigar Lake.

Hydrogeological Model

Hydrogeological flow modeling of the Cigar Lake deposit area was commissioned after the initial flooding of the mine in October 2006, when it was recognized that a better understanding of the complex hydrogeology was required for managing non-routine inflows. It was completed by an independent consultant in 2008. Further updates were made to the model in 2010 based on revisions to the geological model and piezometer readings from the August 2008 inflow, which were used to calibrate the model.

In the case of a non-routine inflow, the hydrogeological flow model predicted an instantaneous inflow rate of up to 1,250 m^3/h, falling to a sustained rate of 700 m^3/h after approximately three days. Natural water seepage into the mine workings is expected to be approximately 30-35 m^3/h over the life of the mine.

Mine Dewatering & Treatment System

The mine dewatering system has been designed and constructed to handle both routine and non-routine inflows. In early 2012, Cameco had increased its installed mine dewatering capacity to 2,500 m^3/h. Mine water treatment capacity has been increased to 2,550 m^3/h and an environmental permit to discharge routine and non-routine treated water to Seru Bay is in process (see above). As a result, Cameco believes it has pumping capacity to meet its standard for the project of one and a half times the estimated maximum inflow.

The mine dewatering system is comprised of three main pumping systems. The primary system has a designed capacity of 700 m^3/h, and will handle the daily routine dewatering requirements. It will also be used in the event of a non-routine inflow. The contingency mine dewatering system will have installed pumping capacity of 800 m^3/h provided by high speed multistage centrifugal pumps located in a new pump room on the 480 m level. This system is currently installed in a temporary pump room, and will be relocated once construction and electrical installation is complete in the permanent facility. The third system is comprised of four borehole pumps, installed and controlled from surface, and has a designed pumping capacity of 1000 m^3/h. All three pumping systems draw water from central collection sumps on the 500 m level, the lowest working level in the mine. All of the systems are routinely tested to ensure they are operating within their required capacities.

The mine water treatment plant (WTP) has a capacity to treat and release mine effluent at a rate of 550 m^3/h. In the case of a mine water inflow exceeding this amount, a contingency water treatment system will be activated. This system is comprised of a 90,000 m^3 holding pond for water clarification and a 10,000 m^3 pond for surge capacity and two reagent addition buildings with capacities of 1,000 m^3/h each. The WTP currently releases treated mine effluent into the Aline Creek system, and will change over to discharging into Seru Bay once the above described facilities are constructed and a licence to operate the facility has been obtained.

As a result, Cameco believes it has sufficient pumping, water treatment and surface storage capacity to handle the estimated maximum inflow.

16.2.10 Independent Review of Mine Design

In 2011, in connection with a regulatory requirement, Cameco retained an independent engineering consultant to perform a technical review of the Cigar Lake mine design. The scope of the assessment was to review the geological, geotechnical and hydrogeological characteristics of the deposit and to evaluate whether the characteristics have been appropriately incorporated into the mine design. Particular focus was spent on the mine layout, ground excavation and support plan, ground freezing approach and the mine dewatering capacity. The review also encompassed the procedural controls Cameco has put in place to manage the risks in each of these areas.

The consultant found no significant exclusions or deficiencies in the material reviewed that would have negative impacts on the ground stability of the excavations or lead to an uncontrolled water inflow into the Cigar Lake mine.

A number of recommendations and suggestions for follow-up were included in the report provided by the consultant in the areas of geological interpretation, hydrogeological modelling, ground freezing, geotechnical data interpretation and ground stability assessment. Cameco has accepted the consultant's recommendations and has an action plan in place to address them in a timely manner.

16.3 Mine Production

16.3.1 Mining Method Selection

The JBS mining method is new to the uranium mining industry and was developed and adapted specifically for the Cigar Lake deposit. Selection and optimization of a mining method capable of extracting the ore efficiently and economically required addressing several geotechnical and hydrogeological challenges such as:

- The low strength of the rock formations encompassing and underlying the orebody and necessary ground support required to stabilize these formations.
- The presence of large volumes of groundwater expected to be encountered while mining the ore or drilling in the overlying sandstone rock formation (including for freezehole drilling) and the potential for a water inflow.
- The high level of radiation build-up from the ore and the associated radon gas from the water in contact with the ore, necessitating containment and isolation to provide adequate protection to the workers.

The JBS mining method and overall mining plan for the Cigar Lake project have been developed specifically to mitigate these challenges and mine the deposit in a safe and economic manner.

A description of the test mining activities undertaken to develop the JBS mining method can be found in Section 16.1.3.

16.3.2 Jet Boring Mining Method

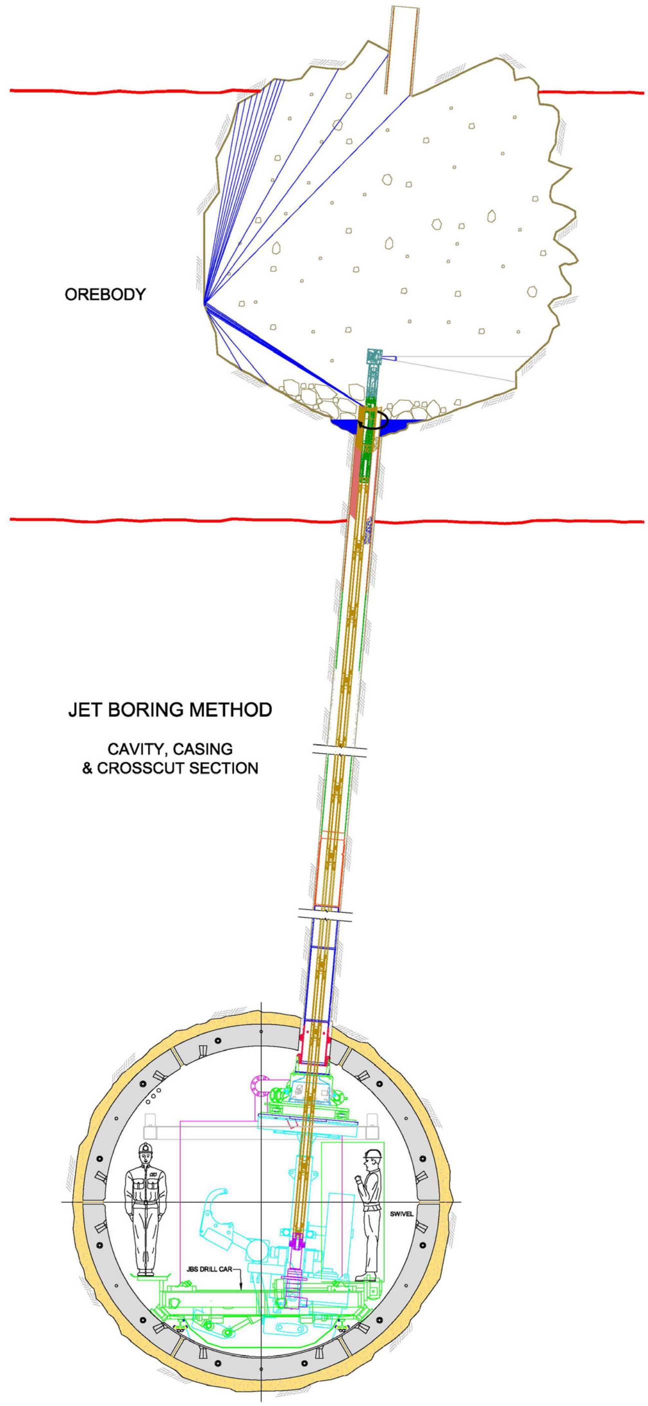
Jet boring mining will consist of cutting the ore with a high pressure water jet using the JBS. The JBS mining units will cut cavities of approximately 4.5 m diameter in the previously frozen ore from each set-up, producing approximately 230 t of ore for a typical 6 m ore thickness. All mining with the JBS will be done from the 480 m production level, located in the basement rock below the ore zone. Following mining, each cavity will be backfilled with concrete.

The features of jet boring as a mining method at Cigar Lake are:

- The method is a non-entry mining method as personnel do not enter into the ore zone, and an operator located some distance away from the jet borer can control the equipment remotely. These are two essential requirements for radiation control during mining of the high grade deposit.
- The cutting of ore with high pressure water produces a slurry which can be pumped in pipelines. This provides the complete containment necessary for minimizing radiation exposure to workers while utilizing a relatively simple and cost effective method for pumping the slurry away from the mining area.
- The generation of airborne dust can be eliminated since the cutting and material transport are both wet and contained processes. This is a significant advantage for radiation control of the mining of high grade uranium ore.
- The incorporation of a drill string inflatable packer within the jet boring system provides a final point of control for managing a potential inrush of water associated with mining.
- Water jets provide the opportunity to excavate ore next to a backfilled cavity without incurring significant dilution from concrete with careful control, through in-hole cavity monitoring. The water jets can also mine around freeze pipes without causing damage to them.
- Jet boring incorporates a fan pattern for drilling the jet bore holes from the production crosscuts, resulting in a design with a reasonable spacing of these headings considering geotechnical stability and economics.

The jet boring mining method is illustrated in *Figure 16-5*.

Figure 16-5: Representative Section of the JBS Mining Method



Source: Cameco

16.3.3 Backfill System

The JBS cavity backfill system and the concrete mix design were tested during the test mining phase (see Section 16.1.3). The concrete mix is designed to achieve high early strength in frozen ground. During the JBS test mining phase, it was demonstrated that the concrete backfill remained intact while jetting an adjacent cavity, with little measureable dilution from the concrete. A few modifications have been made to the design since that time, but no further field trials have been conducted.

Concrete will be prepared on surface in a concrete batch plant. The concrete will be delivered underground through a concrete slickline to a receiving station. The concrete will be transported from the receiving station to the production crosscut in either a truck or will be pumped directly from the receiving station to a re-mix station before being pumped to the production crosscut. From there, it will be pumped directly into each mined-out JBS cavity using a conventional concrete pump. Every JBS cavity will be filled with concrete backfill to enhance ground stability and prevent orebody erosion while mining an adjacent cavity.

A concrete batch plant and one slickline in Shaft No. 1 are currently in place. Two additional slicklines are planned to be installed in Shaft No. 2. Following production startup, Cameco plans to construct a second batch plant, drill two new borehole slicklines from surface and construct a new underground receiving station. Costs for these activities are included in the project capital and operating cost estimates.

16.3.4 Mine Production Criteria and Assumptions

The design criteria and scheduling assumptions for jet boring during production were developed from the results of the test mining and are summarized as follows:

- Average cavity size of 4.5 m diameter and 6 m height resulting in approximately 230 t of ore in place for an average cavity.
- 160 hour average cycle time per cavity, plus a backfilling allowance.
- Four jet boring machines required to produce 18 Mlbs/yr of U_3O_8.
- Two jet boring machines will be required to mine at a given time. Due to limitations on high-pressure water availability, no more than two units will be able to jet at any one time.
- The third and fourth jet boring units will be either moving, setting up, undergoing maintenance, or waiting for high-pressure water for jetting.

16.3.5 Production Schedule

The mine life based on current Mineral Reserves will be approximately 15 years with an estimated full annual production of 18 million pounds of U_3O_8 recovered from the mill. Cigar Lake will produce less than the full annual production in the early and late years of the planned mine life.

The following is a general summary of the Cigar Lake production schedule based on current Mineral Reserves:

- Total mill production of 213.5 million pounds U_3O_8, based upon an overall milling recovery of 98.5%.
- Total mine production of 537 thousand t ore.
- Average mill feed grade of 18.3% U_3O_8.
- Mine operating life of approximately 15 years.
- Commissioning in ore is planned to begin in mid-2013, with the first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013.
- Mining rate is variable to produce at a constant production level of U_3O_8. The average mine production varies annually from 100 to 140 t/d during peak production depending on the grade of ore being mined.
- Cameco expects to ramp up to the full production rate by the end of 2017. Full annual production of 18 million pounds of U_3O_8 is expected to be achieved in 2018.

The mine and mill production schedules for the Cigar Lake project are shown in *Table 16-3* and *Figures 16-6* and *16-7*, respectively.

The Cigar Lake production schedule relies upon the ground being sufficiently frozen prior to the start of JBS mining. As part of the mining plan, the orebody has been divided into production panels, with one JBS unit operating in any panel. At least four production panels need to be frozen at any point in time to achieve the full annual production of 18 million pounds of U_3O_8.

There is a change from the 2010 Technical Report to the production profile, with slightly lower production expected in the first years of the project offset by higher production in the later years. Cameco expects its share of production in 2013 to be about 0.3 million pounds. This compares to Cameco's previous estimate of one million pounds. This and other revisions to Cameco's production schedule represent an 8.7% decrease in Cameco's production forecast through 2016 and are as a result of the extended period required for remediation, a better understanding of the geology and lower grades in initial production panels. See Section 16.3.6 for more details.

Jet Boring System (JBS) Commissioning and Production Rampup

To address the inherent risk of a new mining method, Cameco implemented a comprehensive testing, commissioning and startup plan specific to the JBS. This plan includes surface and underground testing of the JBS unit, training of personnel on the unit in a non-production scenario, conducting reliability engineering studies, and implementing the findings of these studies into both the training of personnel and modification of the JBS system to assure as effective and efficient a startup as possible. The implementation plan for the mechanical commissioning of the entire system has been prepared and work is progressing. Plans for integration of the various teams, namely geology, engineering and mine operations, is in progress. Recruitment for some key positions has already taken place. A simulator is planned to be built to facilitate training on the JBS unit.

As part of the overall commissioning plan, a number of progressive steps have been developed to ready the JBS unit and production facilities for ore production. Through part of 2011, the JBS unit was assembled in a machine shop in Saskatoon. Testing and modification of various mechanical and electrical systems was completed. Starting early in 2012, the JBS unit will be assembled underground and installed in an existing production tunnel. Drilling of as many as ten test pilot holes is planned in waste rock to test the primary drilling systems of the unit and to start hands-on training with the operators and maintenance personnel. As many as ten test cavities will then be mined in waste rock to test many of the jetting systems, such as portions of the high pressure pumping system, jetting nozzle, cavity survey tools and backfill system, as well as facilitate further training. A further four cavities are planned to be test-mined in waste rock to facilitate commissioning of the JBS systems as well as the underground processing facilities. Full commissioning of the entire system will take place with ore following successful completion of the above mentioned plan as well as any required regulatory approvals.

The production rampup schedule is based on starting production with one JBS unit, then bringing additional units on-line in approximately nine month intervals. Purchase, assembly and commissioning of the three remaining JBS units is planned to take place with enough lead time to meet this schedule. Cameco has chosen to single source the manufacturing and supply of the three remaining JBS units to a European based, global mining and tunnelling, equipment supplier. The supplier and Cameco having been working closely through the past two decades of research, development and testing of the JBS mining method and associated equipment and process. Changes to equipment design and configuration and any other lessons learned from start up of earlier units will be incorporated where possible on subsequent units. Productivity rampup factors have been applied to the overall production schedule to reflect faster integration and training from JBS units one through four.

Table 16-3: Cigar Lake Production Schedule Summary

Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Mill Production (Mlbs U_3O_8)	0.6	3.9	11.1	15.8	16.5	17.6	18.1	18.0	17.5	18.0	14.8	15.8	18.0	18.0	9.8	0.0	**213.5**
Mine Production (t x 1000)	1.8	10.8	24.5	39.8	40.8	42.2	41.7	39.0	39.4	44.8	48.9	51.6	50.0	40.6	21.3	0	**537.2**
Mill Feed Grade (% U_3O_8)	13.9	16.5	20.8	18.3	18.6	19.2	20	21.3	20.5	18.6	13.9	14.1	16.6	20.4	21.1	0	**18.3**

Figure 16-6: Mine Production

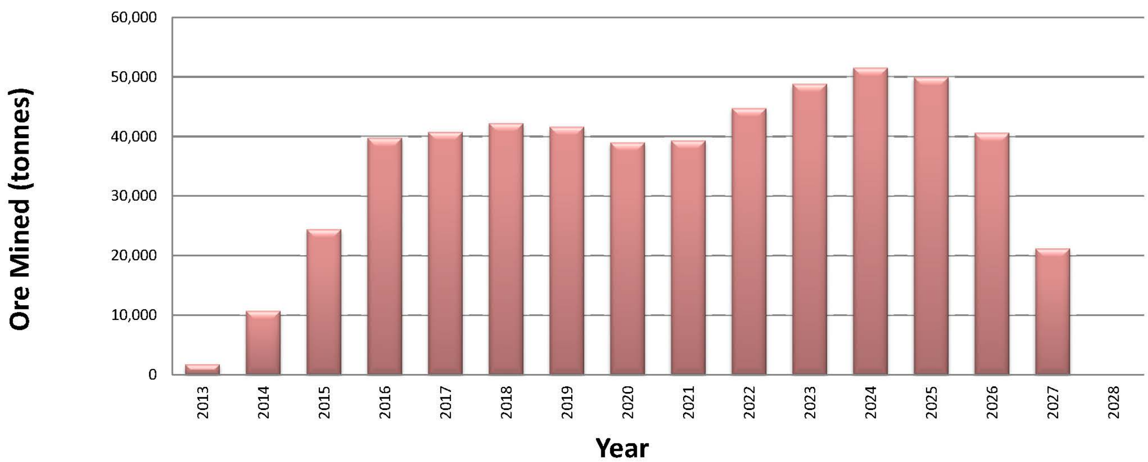
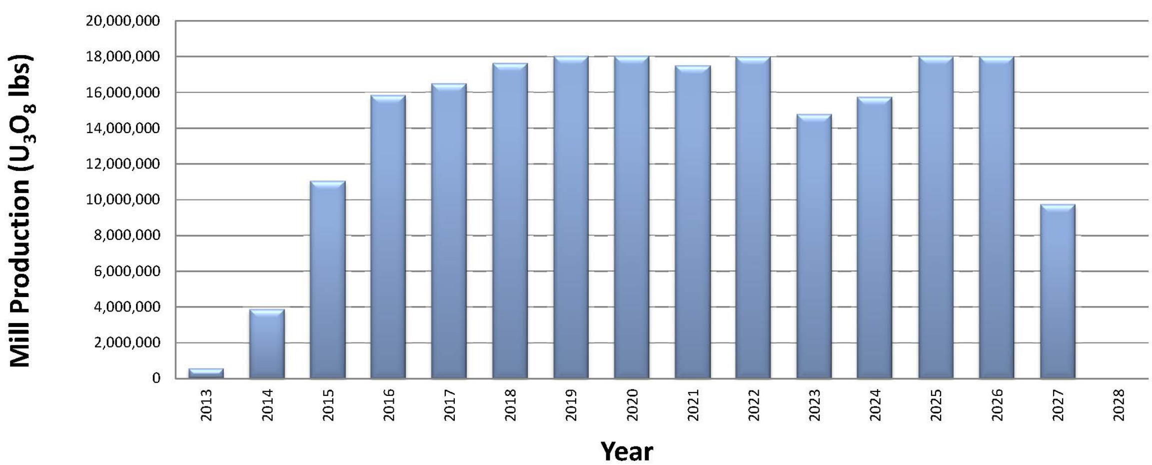


Figure 16-7: Mill Production



16.3.6 Mine Production Rampup Comparison – 2010 Technical Report to Current Plan

Cameco is reporting a 4% decrease in tonnage and an 8% increase in the grade of the Mineral Reserves as compared to the December 31, 2010 estimate. These changes are described in Section 15.3 and are comprised of two main components: changes to the Mineral Resource and Mineral Reserve model and removal of dilution from the mill feed.

Delineation drilling of the Phase 1 area in 2010 and 2011, plus the incorporation of freezehole radiometric data, has contributed to changes in the geological interpretation, Mineral Resource and Mineral Reserve estimates and classification. One area that saw a grade decrease is the area planned for mining during the rampup period. This area showed an overall grade decrease of approximately 2% U_3O_8. This decrease in grade in the initial production panels has contributed to the slower production rampup.

Cameco has also revised the mine plan to remove dilution, primarily sump underflow material, from the mill feed. Removal of this nearly 42,000 tonnes, grading 0% U_3O_8, has contributed to the grade increase of the Mineral Reserves estimated in this technical report, as compared to the Mineral Reserves estimated in the 2010 Technical Report. This 42,000 tonnes was allocated as approximately 3,000 tonnes per year in the production schedule.

Table 16-4 shows a comparison between the 2010 Technical Report and this technical report of the first five years of planned production to illustrate the impacts of the changes to the Mineral Resource and Mineral Reserve model and removal of dilution from the mill feed. In the current production plan, cumulative production to the end of 2017 is approximately 117,000 tonnes grading 18.7% U_3O_8. After removing approximately 3,000 tonnes per year from the production schedule shown in the 2010 Technical Report, cumulative production to the end of 2017 would have been 116,800 tonnes grading 20.7%.

Table 16-4: Comparison Table of Mine Production Schedule 2013 - 2017

	2010 Technical Report		2010 – Dilution Adjusted		2012 Technical Report	
Year	**Total tonnes (x 1000)**	**Grade % U_3O_8**	**Total tonnes (x 1000)**	**Grade % U_3O_8**	**Total tonnes (x 1000))**	**Grade % U_3O_8**
2013	6.2	15.6	4.2	23.0	1.8	13.9
2014	12.4	14.6	9.4	19.3	10.8	16.5
2015	29.9	17.3	26.9	19.2	24.5	20.8
2016	39.9	19.7	36.9	21.3	39.8	18.3
2017	42.4	19.6	39.4	21.1	40.8	18.6
Total	**130.8**	**18.4**	**116.8**	**20.7**	**117.7**	**18.7**

* Comparison of production schedules are reported for the Cigar Lake Joint Venture. Cameco's share is 50.025%.

17 RECOVERY METHODS

17.1 Overview

Cigar Lake ore will be processed at two locations. Size reduction will be conducted underground at Cigar Lake and leaching, purification and final yellowcake production and packaging will occur at the McClean Lake JEB mill. The ore will be trucked in slurry form from Cigar Lake to the McClean Lake JEB mill in purpose-built containers identical to those used successfully to transport McArthur River ore slurry to the Key Lake mill. Where possible, design of the processing facilities for Cigar Lake ore has been modeled on those successfully operating at McArthur River and Key Lake.

17.2 Cigar Lake Flowsheet

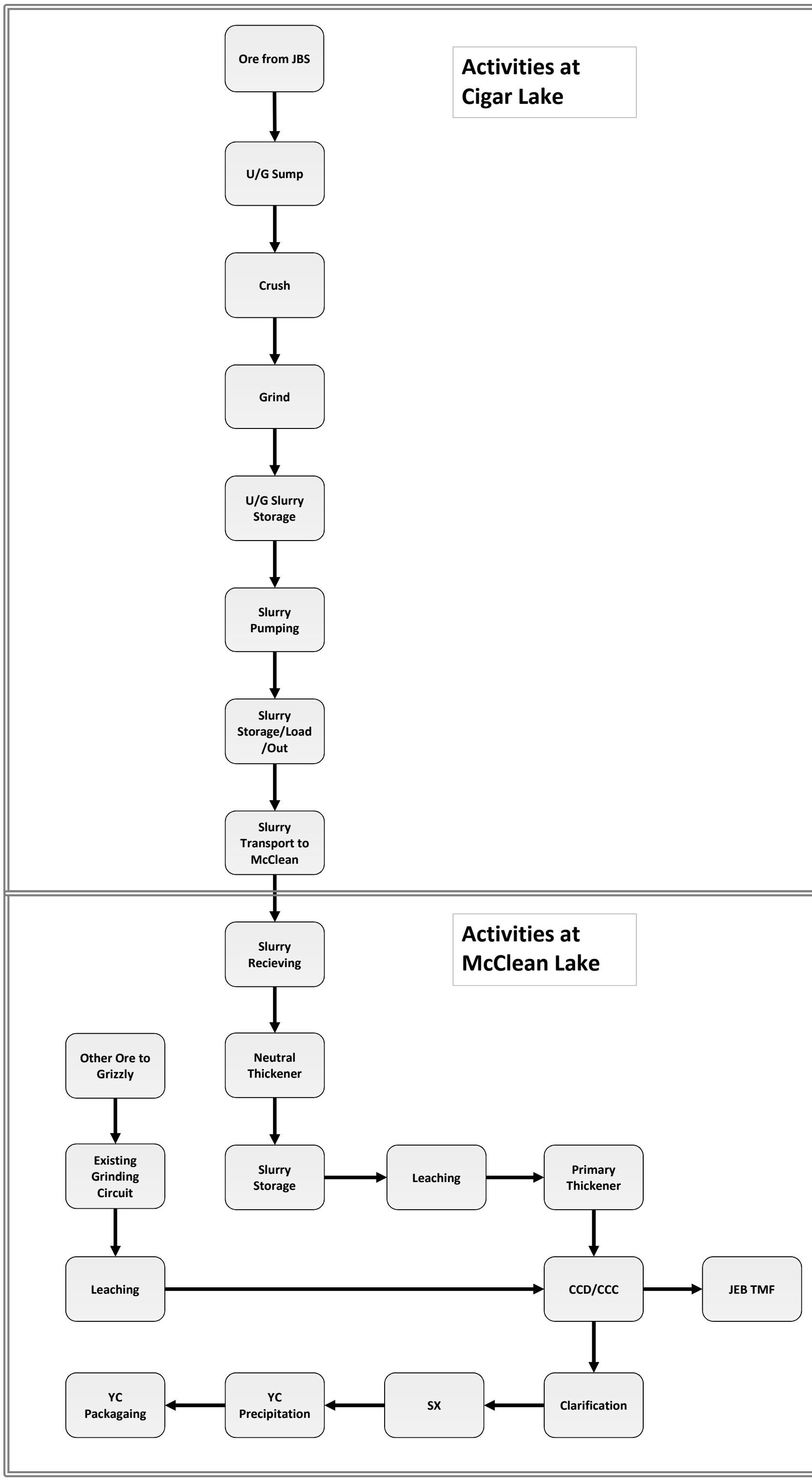
Mined ore and drill cuttings will be piped into local pump boxes as a slurry for transfer to run of mine ore storage sumps. Partially dewatered ore will be reclaimed from the sumps by an overhead crane mounted clamshell and fed by a screw feeder through a water flush cone crusher. Crusher discharge will report mostly to a ball mill operating in closed circuit with classification cyclones. Grinding circuit product will be dewatered and then report to an underground ore slurry storage pachuca tank. From there, the ore slurry will be pumped by positive displacement pumps through slurry pipelines up Shaft No. 2 to ore storage pachucas located on the surface. Thickened ore slurry will be loaded into 5 m^3 containers (four containers per truck) for shipment by road to the McClean Lake JEB mill.

As much as reasonably possible, untreated water will be recirculated in the underground process. Excess water will be pumped to surface and treated in a conventional two stage water treatment plant. Treated water will be recycled in the mining and processing circuits where required. The excess treated water will be released to the environment via a monitoring pond system similar to that used successfully at other facilities such as McArthur River and Key Lake. Precipitated solids from the water treatment process will be dewatered and stored on-site for future disposal underground.

Construction of the water treatment plant is complete while construction on the surface processing facilities is well under way. Engineering design for the underground processing facilities is being revised in accordance with the 2010 mine plan and dewatering systems. The construction of the underground portion of the process equipment has commenced in accordance with the overall project plan.

A high level operation flow sheet of the project ore processing activities is shown in *Figure 17-1*.

Figure 17-1: Cigar Lake Ore Processing Activities – Block Flow Sheet



Source: Cameco

17.3 Processing at McClean Lake

With the signing of the Memorandum of Agreement, which amended the JEB Toll Milling Agreement, the McClean Lake JEB mill is being expanded to process and package all of Cigar Lake's current Mineral Reserves. Currently, the McClean Lake JEB mill has a production capacity of 12 Mlbs U_3O_8 per year. In order to process all of Cigar Lake's current Mineral Reserves and other ores at McClean Lake, the total production capacity at the McClean Lake JEB mill will be increased to 22 Mlbs U_3O_8 per year. Construction of the expanded facility is scheduled to begin in 2012 and be completed in 2015. Mill operation will continue during the construction stages in order to meet the Cigar Lake production schedule.

All of the 18 million pounds of U_3O_8 annual output from Cigar Lake will be converted to yellowcake at the McClean Lake JEB mill. For further discussion of the McClean Lake JEB mill and the JEB Toll Milling Agreement, see Sections 18 and 19.2.1, respectively.

17.4 McClean Lake JEB Mill Flowsheet

Finely ground ore averaging 18.3% U_3O_8 will be trucked from Cigar Lake by B-trains carrying four 5 m^3 slurry containers (3.9 t solids capacity each) to a new receiving facility located at McClean Lake. Slurry receiving at McClean Lake has been modeled on the Key Lake ore slurry receiving facility with enhancements. The slurry will be off-loaded by vacuum, thickened and pumped to storage pachuca tanks.

The existing two stage near atmospheric pressure leach circuit will be reconfigured to two parallel low pressure circuits to allow ore to be leached separately from other ore feeds to McClean Lake. Leach cooling and hydrogen gas concentration control have been added to deal with the exothermic reaction and potential for hydrogen evolution from leaching the high grade ore. An oxygen plant was constructed to provide the leach oxidizing agent. The existing hydrogen peroxide system will be available as an alternative. The leached solution will be fed to the existing primary thickener. The overflow will report directly to the clarification area, and the underflow will be washed with the leach residues from other McClean Lake ores in the Counter Current Decantation (CCD) circuit. Additional wash capacity is available in the new Counter Current Cyclone (CCC) circuit, and can be implemented if required. Additional clarification and storage capacity will be provided for pregnant leach solution. The washed and clarified uranium solution will be fed to two parallel Solvent Extraction (SX) plants. The existing 10 Mlbs U_3O_8/year circuit capacity will be supplemented by a new 17 Mlbs U_3O_8/year SX circuit to provide a total capacity of 27 Mlbs U_3O_8/yr. The pregnant strip solution from the SX circuit will be fed to two parallel molybdenum removal carbon column circuits comprised of two new columns in addition to the existing six. Additional capacity will be installed in the precipitation circuit to increase retention times and improve barren strip clarification. A new centrifuge will provide yellowcake dewatering requirements with the existing centrifuge providing additional capacity if required. Existing calciner and packaging facilities will be used to provide the packaged, calcined product.

The construction of the new and modified facilities required at McClean Lake for processing of all of Cigar Lake's current Mineral Reserves are yet to be completed. Further to the changes mentioned above, a third ammonia reagent supply tank will be added for solvent extraction and precipitation. An additional ammonium sulphate crystallization plant similar in size to the existing plant will be installed as well. The existing acid plant will be expanded to deal with the increased demand. A new tailings neutralisation circuit will be constructed to provide the retention times required.

Extra storage capacity and on-site production for ferric sulphate solution reagent have been added. In addition, the mixing and storage capacity for mixed barium chloride solution reagent has been enlarged.

Cameco believes that the McClean Lake JEB mill will have access to sufficient water, power and process supplies necessary to process all of Cigar Lake's current Mineral Reserves. For further discussion of the McClean Lake JEB mill infrastructure, see Section 18.

17.5 Mill Recovery

Based on the test results, an overall uranium process mill recovery of 98.5% has been used. The processing of ore is described further in Section 13 and details of the anticipated process losses are listed in Section 13.2.

This recovery is similar to that achieved at Cameco's other Saskatchewan operations. For reference, historically the Key Lake mill treating McArthur River mine ore achieves a recovery of approximately 98.7% and the Rabbit Lake mill treating Eagle Point mine ore achieves a recovery of approximately 97.0%. The lower recovery at the Rabbit Lake mill is due to the lower feed grade from the mine to the mill as compared to the McArthur River ore feeding the Key Lake mill.

18 PROJECT INFRASTRUCTURE

Test mining development was conducted from 1987 to 1993, including the sinking of Shaft No. 1 and development on the 420, 480 and 465 m levels. Some surface infrastructure was also constructed during the test-mining phase including a 550 m^3/h water treatment plant. Pre-construction activities were started at the Cigar Lake site in 2002. Full construction activities on the Cigar Lake site began in January 2005 following approval of the project by the CLJV partners in December of 2004. Just prior to the mine inflow of October 23, 2006, the capital construction project was approximately 60% complete (under the previous mine plan).

As of December 31, 2011, underground development required for the start of production is estimated at 70% complete, based on required infrastructure changes identified in the updated mine plan. Surface construction is estimated to be 56% complete.

The following is a listing of the key infrastructure that is required for the Cigar Lake mine site and the McClean Lake JEB mill.

The Cigar Lake mine site includes the following infrastructure already constructed:

- Access road joining the provincial highway and McClean Lake
- Site roads and site grading
- Airport and terminal
- Employee residence and construction camp
- Shaft No. 2 surface facilities
- Water supply, storage, and distribution for industrial water, potable water and fire water
- Propane, diesel, and gasoline storage and distribution
- Electrical power substation and distribution
- Emergency power generating facilities
- Compressed air supply and distribution
- Mine water storage ponds and water treatment
- Sewage collection and treatment
- Surface and underground pumping system installation
- Waste rock stockpiles
- Garbage disposal landfill
- Administration, maintenance and warehousing facilities
- Underground access through Shaft No. 1
- Underground tunnels

Infrastructure to be completed at the Cigar Lake mine site includes:

- Final site grading and paving
- Electrical substation expansion
- Fire water system expansion
- Completion of Shaft No. 2
- Additional underground tunnels
- Pumps and piping for jet boring mining
- Completion of the remaining surface facilities including the ore load-out facility
- Seru Bay pipeline
- Permanent residence expansion
- Underground processing facilities

The Cigar Lake Mine will transport the ore to the McClean Lake site by means of slurry transport containers via the access road.

The McClean Lake JEB mill includes the following infrastructure already constructed:

- A milling facility that has been operating more than 10 years, that includes mine, mill and camp complexes as well as a tailings management facility
- Specific to processing the Cigar Lake ore slurry, the following infrastructure has already been built:
  - Ore slurry offloading facility to receive ore slurry containers from Cigar Lake mine
  - Reconfigured leach circuits with leach coolers and hydrogen gas concentration monitoring and control
  - An oxygen plant with two 20 t/d VPSA units
  - Counter current cyclone circuit (CCC) to supplement the counter current decantation circuit (CCD) for liquid-solid separation
  - Miscellaneous additional equipment and tankage in the mill to process the Cigar slurry

The McClean Lake JEB mill infrastructure to be completed includes:

- An expansion of the downstream circuits to deal with the portion of the uranium rich solution that was previously bound to the Rabbit Lake mill, with the main items composed of:

- A second solvent extraction (SX) circuit to accommodate the increased uranium pregnant aqueous flow
- A new tailings neutralization circuit to be housed in a new building located between the ore slurry offloading facility and the tailings thickener
- Optimization of the existing tailings management facility
- A second CX plant to handle the increased excess ammonium sulphate flow
- Modifications to the existing acid plant to increase its capacity from 125 TPD to 300 TPD
- A new powerhouse with five 2,000 kW diesel generators to provide emergency power in the event of a loss of electricity from Saskpower

In addition, a number of secondary support modifications and additions will be required.

For a discussion concerning the management of tailings at the McClean Lake JEB mill, see Section 20.5.

19 MARKET STUDIES AND CONTRACTS

19.1 Markets

19.1.1 Overview

Nuclear plants around the world use uranium to generate electricity. The following is an overview of the uranium market.

Uranium Demand

The demand for U_3O_8 is directly linked to the level of electricity generated by nuclear power plants. World uranium consumption has increased from approximately 75 million pounds U_3O_8 in 1980 to about 165 million pounds U_3O_8 in 2011.

Uranium Supply

Uranium supply sources include primary mine production and secondary sources such as excess inventories, uranium made available from defence stockpiles and the decommissioning of nuclear weapons, re-enriched depleted uranium tails, and used reactor fuel that has been reprocessed.

Mine Production

The uranium production industry is international in scope with a small number of companies operating in relatively few countries. In 2011, world mine production was estimated at 143 million pounds U_3O_8.

In 2011, an estimated 61% of world mine production was marketed by five producers and 79% of estimated world production was sourced from five countries. The 2011 estimated world production is shown in *Table 19-1*.

Table 19-1: 2011 World Uranium Production

Producer*	M lbs U_3O_8	% of World
KazAtomProm	23	16%
Cameco	22	16%
AREVA	21	15%
Uranium One	11	7%
Rio Tinto Uranium	11	7%
ARMZ	9	6%
BHP Billiton	9	6%
Navoi	6	5%
Paladin	6	4%
Sopamin	4	3%
Others	21	14%
Total	**143**	**100%**

**Based on Marketing Share of Production*

Country	M lbs U_3O_8	% of World
Kazakhstan	52	36%
Canada	24	17%
Australia	16	11%
Niger	12	9%
Russia	9	6%
Namibia	8	6%
Uzbekistan	6	5%
United States	4	3%
Others	11	7%
Total	**143**	**100%**

Source: Cameco

Uranium Markets and Prices

Uranium is not traded in meaningful quantities on a commodity exchange. Utilities buy the majority of their uranium products under long-term contracts with suppliers and meet the rest of their needs on the spot market.

Cameco sells uranium to nuclear utilities in Belgium, Canada, China, Finland, France, Germany, Japan, South Korea, Spain, Sweden, Taiwan and the United States.

In 2011, 37% of Cameco's U_3O_8 sales were to five customers.

Cameco currently has commitments to supply more than 290 million pounds of U_3O_8 under long-term contracts with 54 customers worldwide. Cameco's five largest customers account for 47% of these commitments, and 38% of Cameco's committed sales volume is attributed to purchasers in the Americas (United States, Canada and Latin America), 36% in Asia and 26% in Europe.

Uranium Spot Market

The industry average spot price (TradeTech and UxC) on December 31, 2011 was US$51.88 per pound U_3O_8, down 17% from US$62.25 per pound U_3O_8 at the end of 2010.

Long-Term Uranium Market

The industry average long-term price (TradeTech and UxC) on December 31, 2011 was US$62.00 per pound U_3O_8, down 6% from US$66.00 per pound U_3O_8 on December 31, 2010.

19.1.2 Cameco Market Studies and Analyses

Cameco prepares a uranium supply and demand forecast which reflects its view of supply from all known sources as well as demand from all of the existing and planned reactors in the world. Cameco maintains detailed models tracking supplies by source – production as well as secondary supplies – and demand by reactor. In the preparation of this forecast, Cameco reviews detailed supply and demand models published by industry, such as the World Nuclear Association, tracks public announcements about supplies and reactors, then applies its own expertise and develops a forecast.

The qualified persons for Sections 14, 15, 21 and 22 have reviewed the studies and analyses underlying Cameco's uranium and supply demand forecast and confirm that the results of these studies and analyses support the assumptions used for the portions of the technical report such qualified persons are responsible for.

19.2 Material Contracts for Property Development

There are no contracts material to Cameco that are required for development of Cigar Lake other than:

- the JEB Toll Milling Agreement described in Section 19.2.1.
- the agreement to manufacture and supply the JBS units described in Section 19.2.2.

Section 19.2.3 below contains a description of Cameco's uranium sales contract portfolio, including the base-load contracts that were put in place to support the development of Cigar Lake after the development decision was made by the CLJV.

19.2.1 JEB Toll Milling Agreement

Cigar Lake ore will be processed at the JEB mill located at AREVA's McClean Lake operations, 70 km to the northeast. The MLJV owns the McClean Lake operation, including the JEB mill, and AREVA is the operator of the MLJV. The milling arrangements are subject to the terms and conditions of the JEB Toll Milling Agreement described below.

The JEB Toll Milling Agreement between the CLJV (including Cameco) and the MLJV, made effective January 1, 2002, as amended by a Memorandum of

Agreement, made effective November 30, 2011, sets out the terms and conditions by which the MLJV will process Cigar Lake ore delivered to the McClean Lake JEB mill into uranium concentrates.

The Memorandum of Agreement:

(a) terminates the Rabbit Lake Toll Milling Agreement;

(b) provides that all Phase 1 Cigar Lake ore will be processed at the JEB mill and the MLJV will dedicate the necessary mill capacity to process 18 million pounds per annum;

(c) provides that the CLJV will be responsible to pay for the additional capital costs to modify the JEB mill to process Phase 1 ore excluding the capital costs associated with JEB tailings management facility;

(d) subject to a capped capital contribution from the CLJV of $4.6 million provides that the MLJV will be responsible for all capital costs required to ensure that the JEB tailings management facility can receive and accommodate tailings from processing all of the Phase 1 ore;

(e) contemplates that if an expansion of the JEB tailings management facility is required in order for other ores to be processed at the McClean Lake JEB mill, the CLJV may be required to pay a portion of the capital costs for such expansion; and

(f) contemplates that the JEB Toll Milling Agreement will be amended to give effect to the new milling arrangement.

For the toll milling and related services, the CLJV pays the MLJV toll milling charges comprising the CLJV's share of JEB mill expenses and a toll milling fee.

The Memorandum of Agreement requires the MLJV to modify and expand the JEB mill to process all of the current Cigar Lake Mineral Reserves. Construction of the expanded facility is scheduled to begin in 2012 and be completed in 2015. See Sections 17.3 and 18 for discussion on McClean JEB mill modifications and expansion. Work relating to the optimization of the tailings management facility to accommodate all of Cigar Lake's current Mineral Reserves is planned to proceed in 2012 with completion anticipated in 2013. See Sections 20.5 for discussion on the optimization of the McClean JEB mill tailings facility.

In certain circumstances, the CLJV pays the MLJV standby costs. With the JEB mill being placed in care and maintenance mode in July 2010, Cameco expects that the CLJV will be required to pay standby costs until production starts in 2013. The total expected standby costs to be paid by the CLJV is $174.6 million, including $68.0 million spent as of December 31, 2011. Cameco's share of total standby costs is $89.6 million, which we will be expensed as incurred. The costs estimates and economic modeling (Sections 21 and 22) in this technical report assume these costs are payable until production starts up in 2013.

The CLJV partners are parties to a November 2011 cost confirmation and sharing agreement whereby Cameco and AREVA are responsible to fund capital costs of the initial modifications of the McClean Lake JEB mill in excess of a cap of $74.5 million negotiated by the CLJV partners at their proportionate share. The cap relating to the McClean Lake JEB mill modifications has been met. Cameco's share of the total initial mill modifications to the McClean Lake JEB mill is $44.6 million.

The MLJV is responsible for all costs of decommissioning the JEB mill.

Cameco believes the terms and conditions of JEB Toll Milling Agreement and Memorandum of Agreement are within industry norms.

19.2.2 Agreement to Manufacture and Supply JBS Units

Cameco has chosen to single source the manufacturing and supply of the three additional JBS units to a European based, global mining and tunnelling, equipment supplier. The supplier has been working closely with Cameco through the past two decades of research, development and testing of the JBS mining method and associated equipment and process. Cameco believes the terms and conditions of its 2011 agreement with this European equipment supplier are within industry norms.

19.2.3 Uranium Sales Contracts

Uranium Sales Contracts Portfolio

Cameco has a long-term uranium sales contract portfolio where it commits to supply uranium to its customers. This uranium is projected to come from Cameco's operating mines and mines under development, including Cigar Lake, and from Cameco's spot and long-term uranium purchase contracts. The commercial terms under these contracts are confidential.

Cameco has also entered into a number of long-term contracts for sale of Cigar Lake production (base-load contracts). These base-load contracts were put in place to support the development of Cigar Lake after the development decision was made.

A majority of Cameco's long-term uranium sales contracts contain supply interruption provisions which allow Cameco to reduce, defer or terminate deliveries in the event of any shortfall in planned production or deliveries of purchases under Cameco's agreement to purchase highly enriched uranium from JSC Techsnabexport. Since the Cigar Lake water inflows, Cameco has been in discussions with its customers to address the production delay at the mine and its effects on uranium deliveries. For Cigar Lake base-load contracts that had scheduled deliveries in 2007 through 2012, these volumes are either being deferred to the end of the various contracts or cancelled. For deliveries beyond 2012, Cameco has held discussions with customers resulting in the remaining volumes being deferred. For the remainder of the contracts with supply interruption language provisions that have deliveries scheduled through 2012, Cameco has deferred a portion of the 2012 deliveries for five years.

Impact of Uranium Sales Contracts on Cigar Lake Economic Analysis

Uranium contract terms generally reflect market conditions when the contracts are negotiated. After a contract is accepted, deliveries under a long-term contract do not begin for several years. In the case of the Cigar Lake base-load contracts, the time period will be longer as these contracts were negotiated in 2004 and 2005 and the first deliveries will not take place until after the commencement of production, which is now planned for 2013. Cameco believes the terms of its long-term uranium sales contracts, including the Cigar Lake base-load contracts, generally reflect industry norms.

As a result of Cameco's contracting strategy and the increase in the uranium price over the past few years, Cameco's average realized price for uranium sales in 2011 was US$49.17/lb U_3O_8. The industry average spot price (Trade Tech and UxC) during 2011 was US$56.36/lb U_3O_8. The industry average long-term uranium price (Trade Tech and UxC) during 2011 was US$66.79/lb U_3O_8.

Uranium Price Assumptions

A spot price projection of US$59.00/lb U_3O_8 in 2012 increasing to US$65.00/lb U_3O_8 in 2016 onwards has been incorporated into the realized price projection for the purpose of the economic analysis. The current price projection is consistent with various independent forecasts of supply and demand fundamentals. To the extent the independent forecasts did not extend their projections to cover the entire expected mine life of Cigar Lake, the projections have been extrapolated forward to the end of the anticipated mine life.

Cameco has historically sold U_3O_8 under long-term contracts with its customers, at prices that reflect the market conditions at the time the contract is accepted. Cameco has committed a significant quantity of its future production and purchased material to be delivered through its existing portfolio of long-term sales contracts. The remaining future production will be sold under yet to be negotiated arrangements. For purposes of the economic analysis, Cameco's portion of Cigar Lake production is assumed to be sold into a mix of committed volumes and uncommitted volumes in the same proportion that Cameco expects to sell based on its current level of committed sales relative to its total sales targets.

Table 19-2 outlines the projected average realized prices, taking into account Cameco's current level of sales commitments and the independent spot price projections. The price projections are stated in constant 2012 dollars. The economic analysis assumes an average realized price of $68.62/lb U_3O_8.

In preparing the cash flow analysis included in Section 22 of this report, the impact of Cameco's forward uranium sales strategy has been taken into account.

Table 19-2: Expected Average Realized Uranium Prices by Year

Price Assumptions	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Cigar Lake Average Price $US/lb	56	59	59	61	62	64	64	64	67	67	67	68	69	69	69
Cigar Lake Average Price $Cdn/lb	**56**	**61**	**62**	**64**	**65**	**67**	**67**	**68**	**70**	**71**	**71**	**71**	**73**	**73**	**73**
Exchange Rate	**1.00**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**	**0.95**

Notes:
(1) Average price is partly based on committed volumes, which are derived from Cameco's current contract portfolio commitments, which extend out to 2037.
(2) The projected average price is weighted to the proportion of committed and uncommitted sales volume at the respective committed price and market prices for each year. Average prices included in this table have been rounded.
(3) Cameco's sales volume targets assume no interruption in the company's supply from its production or third party sources.
(4) The projections are stated in constant 2012 dollars.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Regulatory Framework

The Cigar Lake project has regulatory obligations to both the federal and provincial governments. Being a nuclear facility, primary regulatory authority resides with the federal government and its agency, the CNSC. Provincial regulatory authority is generally described in the surface lease between the Province of Saskatchewan and the CLJV. In many cases, there is coordination amongst the federal and provincial regulatory agencies, but each agency retains responsibility for administering its own regulations, approvals, licences and permits where required. The main regulatory agencies that issue permits / approvals and inspect the Cigar Lake project are: the CNSC (federal), Fisheries and Oceans Canada (federal), Environment Canada (federal), Transport Canada (federal), Saskatchewan Ministry of Labour Relations and Workplace Safety (provincial), and Saskatchewan Ministry of Environment (provincial).

One of the initial steps in the regulatory process was to assess the project under the federal and provincial environmental assessment (“EA”) processes.

20.2 Environmental Assessment

The Cigar Lake project that has been assessed for regulatory approval purposes, includes the Cigar Lake mine and associated mine site infrastructure, the processing of the recovered ore at the McClean Lake JEB mill, and the road infrastructure that connects Cigar Lake to the existing road network. Potential effects from the Cigar Lake project have been evaluated as part of several environmental assessments going back to 1987. All aspects of the Cigar Lake project have undergone the required EA and regulatory approval, to allow for the current licensing of the Cigar Lake mine. In 2008, Cameco completed an environmental assessment process which included consideration of the processing of a portion of Cigar Lake uranium concentrate at the Rabbit Lake mill. However, for commercial reasons Cameco has recently announced that the CLJV have agreed to process all Cigar Lake ore at the McClean Lake JEB mill. A brief summary of these assessments and approvals follows.

In 1995, the Cigar Lake project, Environmental Impact Statement (1995 EIS) was submitted to the Joint Federal-Provincial review panel on Uranium Mining Developments in Northern Saskatchewan (the “Panel”). The 1995 EIS evaluated the operation of a high-grade uranium mine at Cigar Lake, producing ore over a 40-year period, with ore being transported by truck to the nearby McClean Lake uranium mill for processing. In 1997, the Panel recommended that pending identification of a suitable waste rock disposal location, the project should proceed. The Canadian and Saskatchewan governments both accepted the Panel’s recommendation and in 1998 both government bodies approved the project in principle.

A 1999 review of the waste rock disposal options concluded that the Sue C pit at McClean Lake operation was the best waste rock disposal option. The Disposal of Cigar Lake Waste Rock Environmental Impact Statement (2001 EIS) was submitted in August 2001, under the harmonized federal-provincial environmental assessment process. This 2001 EIS also assessed the future construction of a permanent access road to Cigar Lake site and the future transportation of waste rock over that access road. In August 2003, the CNSC concluded that the 2001 EIS and associated documents met the requirements of the *Canadian Environmental Assessment Act* (CEAA) and that the licensing/permitting processes for the Sue C pit as a waste rock disposal site and construction of the permanent access road could proceed (Cameco EASR, 2004).

In January 2003, the CNSC informed Cameco that due to a perceived uncertainty regarding the use of the transitional provisions of CEAA, the CNSC would require a new environmental assessment of the Cigar Lake mine portion of the project to support construction and operation licence decisions. However, Saskatchewan Environment (now referred to as the Saskatchewan Ministry of Environment) indicated that the assessment requirements under the *Saskatchewan Environmental Assessment Act* had been fully met by the 1995 EIS and 2001 EIS submission and approval processes.

In February 2004, Cameco submitted an environmental assessment study report (2004 EASR) for the Cigar Lake mine portion of the project under CEAA to meet the above requirement. In the 2004 EASR, the CNSC was identified as the sole "Responsible Authority". The 2004 EASR assessed the potential effects from the construction, operation and decommissioning of the Cigar Lake mine. The 2004 EASR did not reassess the transportation of the ore to the McClean Lake JEB mill, milling of the ore, or the management of tailings. The 2004 EASR was accepted by the CNSC as meeting the requirements of CEAA and therefore the licensing/permitting processes for the Cigar Lake project could proceed.

AREVA is the operator of the McClean Lake JEB mill on behalf of the MLJV. The processing of all the ore slurry from the Cigar Lake mine will be at the McClean Lake JEB mill. This was assessed and approved as part of the 1995 EIS. An amendment to the McClean Lake JEB mill's Licence to Operate is still required in order to process the ore from the Cigar Lake mine at the McClean Lake JEB mill. No issues surrounding this licence amendment approval are anticipated.

The McClean Lake JEB tailings management facility (TMF) is designed to reduce environmental effects through operations to post-decommissioning; when a full soil cover will be in place. This is achieved through the application of operational and mitigation controls that provide for the careful subaqueous placement of thickened engineered tails into a hydrodynamically contained TMF. As the facility has been designed, environmentally assessed and licensed on the primary basis of receiving Cigar Lake ore, no material changes, if any, are anticipated to be required to AREVA's licence and/or provincial operating approvals when in receipt of Cigar Lake ore. AREVA has received regulatory approval to proceed with the work for optimization of the TMF necessary to receive all of the tailings from processing all of Cigar Lake's current Mineral Reserves. This work is anticipated to be completed in 2013.

In December 2008, Cameco submitted to the CNSC a project description for implementing measures intended to better manage the increased quantities of water inflow that could potentially be experienced during the construction and operation of the Cigar Lake project. Specifically, this project will involve establishing infrastructure to allow for the discharge of treated water directly to Seru Bay of Waterbury Lake. A positive decision on this screening level environmental assessment was received in 2011 and construction of the infrastructure is expected to be completed in 2012.

20.3 Licences and Permits

As previously discussed, the regulatory framework for the normal construction and operation of any mine site is subject to an ongoing process during which permits, licences and approvals are requested, reported on, amended, expire and are renewed.

Based on the acceptance by the CNSC of the 2004 EASR, Cameco, in 2004, applied for a licence to construct the Cigar Lake mine site in two parts:

(1) construction of the Shaft No. 2 surface complex and the freeze plant; and

(2) construction of all other mining and support facilities at the Cigar Lake mine site.

In July 2004, the CNSC approved the construction of the Shaft No. 2 surface complex and the freeze plant. The CNSC issued the construction licence in December 2004 for a three-year term expiring in December 2007. As a result of the October 2006 water inflow, the construction licence was amended in December 2007 to extend its term from December 31, 2007 until December 31, 2009, so actions resulting from the 2006 inflow event could be addressed and mine remediation could proceed. The licence was subsequently amended in June 2008 to enable Cameco to proceed with a limited scope of work including mine dewatering, shaft remediation and mine entry to secure/assess the underground workings. In August 2008, during dewatering, a new water inflow source developed, leading to the decision to suspend dewatering to ensure it was understood and that appropriate measures to mitigate the inflow could be taken.

In 2009, after plugging the new source, again from the surface, Cameco re-initiated dewatering of the main shaft. In addition, the CNSC licence was again extended to December 31, 2013 allowing for completion of the mine construction project, including completion of remediation, Shaft No. 2 and surface construction. Additional regulatory approvals for certain licence activities, such as the mine plan and establishment of Shaft No. 2 as a second means of egress, were obtained in 2011 and early January 2012, respectively, allowing for the complete remediation and resumption of pre-flood underground construction and development.

With the 2011 acceptance of the Cigar Lake Water Inflow Management Project screening level environmental assessment, that allows for the direct discharge of treated mine water effluent to Seru Bay, approval was received to begin construction. Completion and subsequent operating approvals from CNSC and the Province are expected in 2012. As well, under the provincial operating approval, specific approvals to construct and/or operate relevant components of the surface infrastructure will be required.

An amendment to the McClean Lake JEB mill's Licence to Operate is still required in order to process the ore from the Cigar Lake mine at the McClean Lake JEB mill. No issues surrounding this licence amendment approval are anticipated. AREVA has received regulatory approval to proceed with the work for optimization of the TMF necessary to receive all of the tailings from processing all of Cigar Lake's current Mineral Reserves. This work is anticipated to be completed in 2013.

Concurrent with mine construction, which is being completed under a construction licence that expires at the end of 2013, an operating licence application will be prepared for submission to the CNSC. The operating licence process is expected to consist of two formal hearings per the CNSC process. To facilitate a smooth transition to operations state, the process will be initiated while construction of the facilities is being completed. Any construction activities that might remain would be covered by the new operating licence.

The surface facilities and mine shafts for the Cigar Lake project are located on lands owned by the Province of Saskatchewan. Cameco acquired the right to use and occupy the lands under a surface lease agreement with the Province. In 2011, with the signing of the most recent surface lease agreement, the area of the surface lease was increased to provide for the area necessary for the discharge of treated effluent to Seru Bay at Waterbury Lake. The Cigar Lake surface lease covers a total area of 1,042 ha of Crown land around the Cigar Lake site and stipulates various provisions and conditions for the use of this land. Cameco is compliant with the terms and provisions in the surface lease agreement.

20.4 Water Treatment and Effluent Discharge

The water treatment/effluent discharge system employed at the Cigar Lake mine site has been designed based both on the results of metallurgical test work programs and Cameco's experience at other facilities. The design is intended for both typical and emergency water treatment and effluent discharge scenarios. The current system, as described below, is approved and licensed by the CNSC and Saskatchewan Ministry of Environment (SMOE).

Retained surface water and recovered groundwater from the mine are pumped to the water treatment plant (WTP). The WTP uses a two-stage treatment process. Both stages involve chemical addition, precipitation and filtration.

Under normal operating conditions, treated water from the WTP is designed to be discharged to the environment on a batch discharge basis. As per the design, treated water from the WTP is discharged to one of four lined ponds. The water in these ponds is tested prior to release to the environment. All water that fails to meet licence/operating approval requirements is returned to the WTP for re-treatment. Two ponds are included in the WTP design to allow for the safe storage of excess water. Through the construction period of the project, where mine water volumes and contaminant loadings are low, to help improve the management of potential ice build-up in the ponds, approvals are in place to allow for continuous discharge during winter months.

The WTP is designed to be able to treat water up to 550 m^3/h; however, normal operating conditions are expected to average up to 135 m^3/h. The treatment is complimented with additional surface storage capacity of approximately 100,000 m^3. In addition, to ensure all water is treated prior to discharge, contingency treatment capacity can be activated to match the planned pumping capacity of the mine.

As a result of the October 2006 and August 2008 water inflow incidents, Cameco reviewed the emergency mine dewatering strategy. It was determined that one of the safest ways to mitigate the impact of potential future mine inflows is to increase the mine's dewatering capacity. Doing so requires an enhancement to the mine's ability to treat and release treated effluent to the environment. Cameco therefore re-evaluated options to address potential mine effluent discharge restrictions in the event of any future inflow scenarios. Specifically, the risk of erosion in the Aline Creek system was evaluated. In December 2008, an application was made to move the discharge point and to discharge treated effluent directly to Seru Bay of Waterbury Lake. This is where the Aline Creek system currently enters Waterbury Lake. This application triggered under CEAA a joint federal/provincial screening level environmental assessment, which was accepted in 2011, after which approval to proceed with construction was received. Interim approvals and measures are in place to support increased environmental discharges of up to 1,100 m^3/h to the Aline Creek system if the need were to arise prior to the Seru Bay discharge point being operational.

Cameco believes that it has sufficient capacity to handle an estimated maximum inflow and, as noted in this report, has installed additional capacity to assure the long-term success for the project.

For a further discussion on the mine water management, see Section 16.2.9.

In respect of the McClean Lake JEB mill, all water must be treated before it is released to the environment. All water that fails to meet licensing/operating approval requirements is returned to the water treatment plant for re-treatment.

20.5 Ore Processing and Tailings

The McClean Lake JEB mill will process the Cigar Lake ore slurry in a dedicated leach circuit separate from other ores that may be concurrently processed in the McClean Lake JEB mill. The combined residue from both ores will be treated in the upgraded McClean Lake mill tailings neutralisation area. Neutralised tailings will be pumped to the existing TMF (See Sections 17.2 and 17.4). Work relating to the optimization of the TMF to accommodate tailings from the processing of all of Cigar Lake's current Mineral Reserves is planned to proceed in 2012 and be completed by 2013.

During the processing of Cigar Lake ore, ore tailings will be generated at the McClean Lake JEB mill. The JEB Toll Milling Agreement manages the financial liabilities associated with these tailings. For discussion of the JEB Toll Milling Agreement, refer to Section 19.2.1.

20.6 Waste Rock

Waste rock generated at the Cigar Lake mine site is currently stored on-site in one of four waste rock piles, depending on the nature of the waste rock. The first two of these are the clean waste stockpiles, which will remain at the mine site. The third is mineralized waste (>0.03% U_3O_8), contained on a lined pad, which is planned to be disposed of underground at the Cigar Lake mine. No mineralized waste has been identified in the development to date. The fourth is potentially acid generating waste rock which will be temporarily stored at site on a lined pad and will be eventually transported to the Sue C pit at the McClean Lake facility for permanent disposal. The costs of the eventual disposal of Cigar Lake's potentially acid generating waste rock in Sue C pit, as described in the Waste Rock EIS noted above, is covered by the Potentially Reactive Waste Rock Disposal Agreement between the MLJV and CLJV dated January 1, 2002. The cost of this disposal is included in the Cigar Lake mine operating cost estimate.

20.7 Reclamation / Remediation

The Cigar Lake project Preliminary Decommissioning Plan (PDP) was initially completed in May 2002 and was most recently revised as part of the licensing that occurred in 2008. This preliminary decommissioning plan considers the environmental liabilities up to the end of the construction of the facility. This PDP was approved by both federal and provincial regulatory agencies and is supported by a financial assurance based on a preliminary decommissioning cost estimate (PDCE) of $27.7 million. The financial assurance is posted with Saskatchewan Ministry of Environment.

As part of the operating licence application, Cameco will need to review the PDP and account for changes to the reclamation and remediation liabilities associated with the management of the ore and any associated wastes. The PDCE will also be reviewed and if required revised to reflect any changes in the PDP. The Cigar Lake PDP discusses the approach to addressing the liabilities that are associated with mining. The future liabilities will be addressed in subsequent revisions to the Cigar Lake PDP.

The reclamation and remediation activities associated with the Cigar Lake project waste rock and/or tailings disposal at the McClean Lake facility are covered by the PDP and PDCE prepared for these facilities.

21 CAPITAL AND OPERATING COST ESTIMATES

21.1 Project Construction Status – December 31, 2011

Pre-construction activities were started at Cigar Lake in 2002 with full construction activities commencing in January 2005. The 2006 and 2008 water inflows resulted in a suspension of construction activities. With the mine fully secured, the underground rehabilitation program complete and regulatory requirements met, Cameco has resumed underground construction activities. Underground development required for the start of production is estimated at 70% complete, based on required infrastructure changes identified in the updated mine plan. Surface construction is estimated to be 56% complete. The infrastructure completed to date is described in Section 18.

The historical costs reflect costs since 2004, including remediation costs to date as well as the completed facilities to date. Historical costs and current commitments also include costs for partially completed facilities, including Shaft No. 2 and underground development and freezehole drilling.

The cost estimate to complete underground development and surface facilities at the Cigar Lake site for the years 2012 and 2013 will consist of:

- Mine development and freezehole drilling which include the costs to complete the underground development and freezehole drilling as well as the surface freezehole drilling;
- Site services, which include the support costs for site administration, licences and taxes, commuting and camp operating costs, electricity and fuel costs, warehousing, as well as engineering and construction management;
- Updated mine plan scope additions which include expanded sumps, new high pressure pump room, underground shop facilities, electrical rooms;
- Completion of the Shaft No. 2, which includes the costs to excavate, install a hydrostatic liner, and furnish the shaft;
- Completion of the underground mine infrastructure capital, which includes the brine system freezing infrastructure, the underground ore extraction system (jet boring), the ore processing circuit, and water handling; and
- Completion of the remaining surface facilities, which includes the new administration/services building, the installation of the surface ore process facilities, new propane tank farm and the permanent employee residence expansion.

The McClean Lake JEB mill was modified from 2005 to 2007 in order to receive and process the Cigar Lake ore. As a result of the new toll mining arrangement, the McClean Lake JEB mill will need to be expanded to process all of the current Cigar Lake Mineral Reserves. The McClean Lake infrastructure to be completed is described in Section 18 and the JEB Toll Mining Agreement is described in Section 19.2.1.

21.2 Capital and Other Costs

In 2010, Cameco released the 2010 Technical Report showing expected capital and remediation costs to the end of construction of approximately $2.0 billion. Since that time, the total project cost has escalated to approximately $2.6 billion due to a number of factors. The majority of the cost increase is the result of increased costs at the Cigar Lake mine site construction for surface freeze implementation, general cost escalation and costs to upgrade and expand the McClean Lake JEB mill. The cost estimates in this paragraph are on a 100% basis.

The remaining capital cost estimate as of December 31, 2011 for the Cigar Lake project is summarized in *Table 21-1*. The majority of the expenditures in the mine, plant and mill are for development, construction and equipment in order to achieve the required production. The capital and other cost projections are stated in constant 2012 dollars.

Table 21-1: Cigar Lake Capital and Other Costs Forecast by Year

Capital Costs ($Cdn M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Cigar Lake Development	$437.2	$264.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$701.4
McClean Lake JEB Mill Modifications	37.2	55.7	43.1	20.0	-	-	-	-	-	-	-	-	-	-	-	-	155.9
Cigar Lake Sustaining	-	16.1	33.9	7.3	8.2	8.4	16.6	16.9	15.9	15.6	15.8	15.1	13.2	8.6	3.6	-	195.2
McClean Lake JEB Mil Sustaining	-	3.1	7.5	9.6	10.7	10.8	10.9	11.0	10.9	10.9	16.6	16.1	16.4	16.7	16.4	14.2	181.8
Total Capital Costs	**$ 474.4**	**$ 339.1**	**$ 84.5**	**$ 36.9**	**$ 18.9**	**$ 19.2**	**$ 27.5**	**$ 27.9**	**$ 26.8**	**$ 26.5**	**$ 32.4**	**$ 31.2**	**$ 29.6**	**$ 25.3**	**$ 20.0**	**$ 14.2**	**$ 1,234.3**
McClean Lake Standby Costs	**$ 57.5**	**$ 49.1**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 106.6**

**** presented as total cost to the Cigar Lake Joint Venture**

As shown in *Table 21-1* the remaining capital costs, as of December 31, 2011, for the Cigar Lake Project are estimated to be $857.3 million, including $701.4 million to complete underground development, underground construction and surface construction at Cigar Lake and $155.9 million to complete the mill modifications at McClean Lake. Mill modifications at Rabbit Lake are no longer required due to the Memorandum of Agreement. Standby costs at the McCLean Lake JEB mill are expected to be $106.6 million, for a total remaining cost of $963.9 million for the Cigar Lake project. *Table 21-1* also includes projected sustaining capital expenditures of $377.0 million that the CLJV will be required to fund throughout the operating life of the Cigar Lake mine. The cost estimates in this paragraph are on a 100% basis.

Cameco's share of the remaining capital and other costs to complete the Cigar Lake project is $483.6 million, including $428.9 million of capital costs and $54.7 million of standby costs. Including the $675.3 million spent by Cameco on construction costs and mill modification costs prior to December 31, 2011, Cameco's share of the aggregate capital cost is now estimated to be $1.1 billion ($192 million over the 2010 Technical Report). In addition, Cameco's share of the projected sustaining capital expenditures is $188.6 million.

Under the terms of the JEB Toll Milling Agreement, the CLJV partners are responsible for the payment of standby costs to the MLJV under certain conditions. AREVA shut down the McClean Lake JEB mill in July 2010, at which time, the CLJV began paying the standby costs. These costs are expected to continue until production start up in 2013. The total expected cost of standby costs to be paid by the CLJV partners is $174.6 million. Cameco's share is $89.6 million, which will be expensed as incurred.

Cameco's share of the aggregate remediation cost at Cigar Lake which was spent and expensed beginning in 2006 is estimated to be $86.4 million. Cameco has expensed its share of the remediation costs as they were incurred. More specifically, the costs that were expensed related to contractor costs that were directly engaged in, or provided support to, the remediation efforts, and any cancellation or retention costs that were required as a result of the water inflow. As of December 31, 2011, remediation activities are complete.

CLJV's aggregate capital cost for Cigar Lake construction, including construction costs prior to December 31, 2011 of $1.3 billion, is estimated to be approximately $2.2 billion. Total remediation costs for the CLJV are in addition to the capital cost and are $182.2 million. Standby costs will add an additional $174.6 million to the total costs. The combined capital and other costs for the Cigar Lake project are now estimated to be approximately $2.6 billion for the CLJV. The cost estimates in this paragraph are on a 100% basis.

The major components of the revised cost estimates, including Cameco's share, are detailed in *Table 21-2*.

Table 21-2: Summary of Project Estimated Costs by Cost Area

Cost Area Description	CLJV 2004-2011	CLJV 2012-2015	CLJV Total (100%)	Cameco Share (50.025%)
	Cost (Cdn $ millions)			
Cigar Lake Minesite				
Mine Development	179.9	100.9	280.8	140.5
Site Services	528.6	224.0	752.6	376.5
Mine Remedation - Capital	39.7	-	39.7	19.9
Mine Remedation - Expense	182.2	-	182.2	86.4
Mine Plan Scope Additions	18.8	0.6	19.4	9.7
Number 2 Shaft	102.0	28.0	130.0	65.1
Mine Capital Underground	121.1	157.3	278.4	139.3
Surface Capital	215.2	142.6	357.8	179.0
Other	50.4	47.9	98.3	49.2
Total Cigar Lake Minesite	1,437.9	701.4	2,139.3	1,065.6
Rabbit Lake Mill Modifications				
EIS & Licensing	1.1	-	1.1	0.6
Mill Modifications capped amount	5.5	-	5.5	2.8
Total Rabbit Lake Mill Modifications	6.6	-	6.6	3.4
McClean Lake JEB Mill Modifications				
Mill Modifications	87.1	155.9	243.0	121.6
Standby Costs	68.0	106.6	174.6	89.6
Total McClean Lake JEB mill Modifications	155.1	262.5	417.6	211.2
TOTAL Cigar Lake Project	1,599.6	963.9	2,563.5	1,280.2

Note : Cameco is responsible for a 50% share of certain JEB Mill modifications in excess of the negotiated cap and for standby costs above 80% of fixed costs.

Rabbit Lake mill modifications were made during the period 2004-2009 to prepare the mill to accept Cigar Lake ore. Under the new Memorandum of Agreement, the Rabbit Lake Toll Milling Agreement has been terminated, and 100% of Cigar Lake ores are committed to the JEB mill. No further costs will be incurred at Rabbit Lake.

Under the terms of a November 2011 cost confirmation and sharing agreement between the CLJV partners described in Section 19.2.1, Cameco and AREVA are responsible to fund capital costs of the initial modifications of the McClean Lake JEB mill in excess of a cap of $74.5 million negotiated by the CLJV partners at their proportionate share. The cap relating to the McClean Lake JEB mill modifications has been met. Cameco has funded its proportionate share of the costs. These costs have been included in the economic analysis.

21.3 Operating Cost Estimates

Estimated operating expenditures for the underground mining operation and for toll milling charges and fees are presented in *Table 21-3*.

Operating costs consist of annual expenditures at Cigar Lake, after the commencement of production in 2013, to mine the ore, treat the ore underground, including crushing, grinding and density control, followed by pumping the resulting slurry to surface for transportation to McClean Lake.

Operating costs at McClean Lake consist of the cost of leaching 100% of the Cigar Lake ore slurry into uranium solution and further processing into yellowcake.

To the extent that the McClean Lake JEB mill is co-processing ore from other mine sites, the toll milling agreement has provisions addressing the sharing of operating costs with the CLJV.

Operating costs for the Cigar Lake project, as a whole, are expected to average approximately \$18.57/lb U_3O_8 over the life of the Cigar Lake project. The 2010 Technical Report showed expected operating costs to average \$23.14/lb U_3O_8 over the life of the Cigar Lake project. The decrease in operating costs is primarily due to the agreement to mill all of the Cigar Lake Mineral Reserves at the McClean Lake JEB mill. The operating cost projections are stated in constant 2012 dollars and assume the throughput outlined in the production schedule in Section 16.3.5.

Cameco plans to begin commissioning in ore in mid-2013, with the first pounds to be packaged at the McClean Lake mill in the fourth quarter of 2013. Costs incurred during the commissioning phase will be capitalized as pre-operating costs until commercial production is achieved.

Table 21-3: Cigar Lake Operating Cost Forecast by Year

Operating Costs ($Cdn M)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Cigar Lake Mining	$ 55.8	$ 146.7	$ 150.9	$ 170.7	$ 165.0	$ 173.1	$ 176.2	$ 166.0	$ 163.0	$ 159.8	$ 157.4	$ 138.3	$ 128.1	$ 125.7	$ 104.8	$ 2,181.5
McClean Lake JEB Milling	31.5	76.5	97.6	108.1	109.2	111.0	111.4	110.7	110.2	112.1	108.9	110.8	113.3	111.2	96.2	1,518.7
Total	87.3	223.2	248.5	278.8	274.2	284.1	287.6	276.7	273.2	271.9	266.3	249.1	241.4	236.9	201.0	3,700.2
McClean Lake JEB Toll Milling	0.9	6.0	16.7	21.8	22.7	24.2	24.8	24.7	24.0	24.8	20.3	17.4	14.7	14.7	8.0	265.7
Total Operating Costs	**$ 88.2**	**$ 229.2**	**$ 265.2**	**$ 300.6**	**$ 296.9**	**$ 308.3**	**$ 312.4**	**$ 301.4**	**$ 297.2**	**$ 296.7**	**$ 286.6**	**$ 266.5**	**$ 256.1**	**$ 251.6**	**$ 209.0**	**$ 3,965.9**
Total Operating Cost per lb U3O8	**$ 159.21**	**$ 58.97**	**$ 23.96**	**$ 18.97**	**$ 17.99**	**$ 17.48**	**$ 17.29**	**$ 16.72**	**$ 16.98**	**$ 16.45**	**$ 19.38**	**$ 16.92**	**$ 14.21**	**$ 13.94**	**$ 21.39**	**$ 18.57**

**** presented as total cost to the Cigar Lake Joint Venture**

22 ECONOMIC ANALYSIS

22.1 Economic Analysis

The following economic analysis as shown in *Table 22-1* for the Cigar Lake project is based on the current mine plan which contemplates the mining and milling of all of the current Mineral Reserves. The analysis does not contain any estimates involving the potential mining and milling of Mineral Resources. Expenditures required to bring any of the Mineral Resources into production or to identify additional Mineral Reserves and Mineral Resources, have not been included. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

The analysis provided is from the point of view of Cameco, which owns 50.025% of the CLJV, and incorporates Cameco's projected sales revenue from its proportionate share of the related production, less its share of the related operating and capital costs of the CLJV, as well as all royalties and resource surcharges that will be payable on the sale of the concentrates.

Table 22-1: Cigar Lake Economic Analysis – Cameco's Share

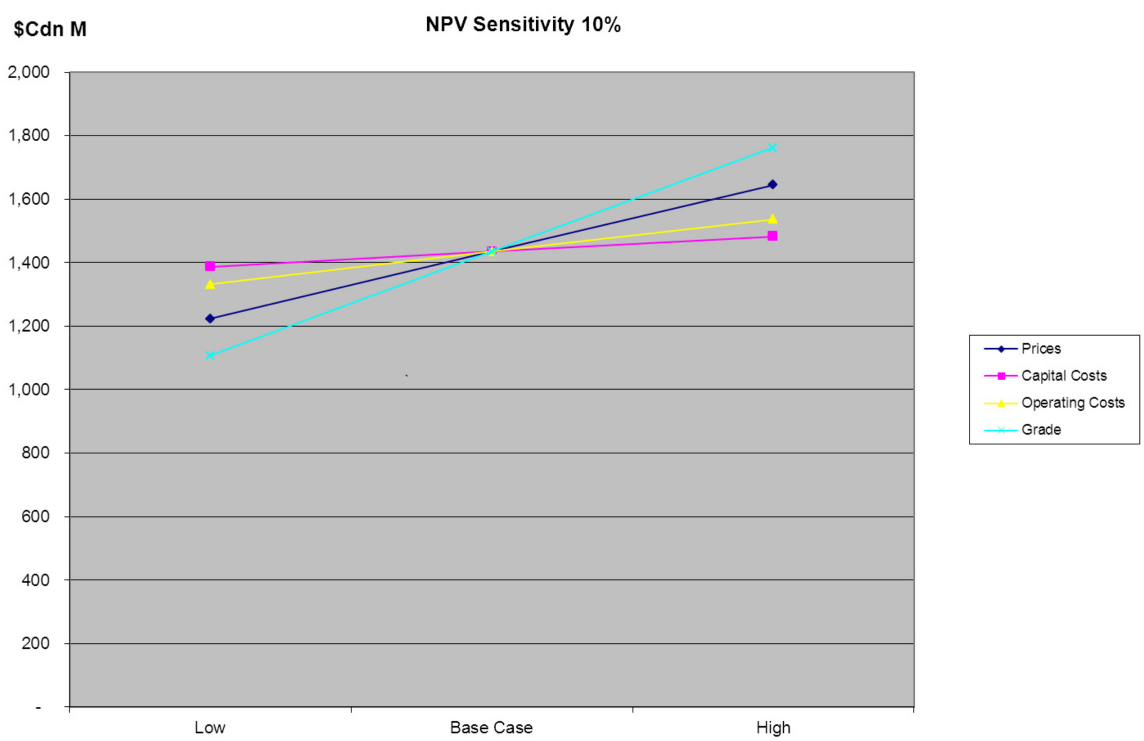
Economic Analysis ($Cdn M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Production volume (000's lbs U3O8)	-	277	1,944	5,536	7,929	8,256	8,825	9,036	9,020	8,759	9,024	7,396	7,881	9,014	9,028	4,888	-	106,813
Sales revenue	$ -	$ 15.6	$ 119.5	$ 342.6	$ 504.1	$ 534.5	$ 589.6	$ 608.3	$ 610.3	$ 616.8	$ 637.7	$ 524.0	$ 558.7	$ 654.3	$ 657.7	$ 356.1	$ -	$ 7,329.8
Operating costs	-	44.1	114.7	132.7	150.3	148.5	154.2	156.3	150.8	148.7	148.4	143.4	133.3	128.1	125.9	104.5	-	1,983.9
Standby costs	29.5	25.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.7
Capital costs	237.3	169.7	42.3	18.5	9.4	9.6	13.8	13.9	13.4	13.2	16.2	15.6	14.8	12.7	10.0	7.1	-	617.5
Basic royalty	-	0.6	4.8	13.7	20.2	21.4	23.6	24.3	24.4	24.7	25.5	21.0	22.3	26.2	26.3	14.2	-	293.2
Tiered royalty	-	-	-	6.0	34.0	47.4	53.4	55.4	55.7	57.8	59.8	49.2	52.5	62.4	62.8	34.0	-	630.4
Resource Surcharge	-	0.5	3.6	10.3	15.1	16.0	17.7	18.2	18.3	18.5	19.1	15.7	16.8	19.6	19.7	10.7	-	219.8
Net pre-tax cash flow	$ (266.8)	$ (224.5)	$ (45.9)	$ 161.4	$ 275.1	$ 291.6	$ 326.9	$ 340.2	$ 347.7	$ 353.9	$ 368.7	$ 279.1	$ 319.0	$ 405.3	$ 413.0	$ 185.6	$ -	$ 3,530.3
Pre-tax NPV (8%)	$ 1,435																	
Pre-tax IRR (%)	32.8%																	

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, for net cash flows from January 1, 2012 forward, of $1.4 billion for its share of the Cigar Lake Mineral Reserves. The pre-tax IRR, also calculated from January 1, 2012, is estimated to be 32.8%.

22.2 Sensitivities

The graph in *Figure 22-1* illustrates the project's sensitivity to changes in uranium grade, capital cost, operating cost, and uranium prices (including the mitigating effects of Cameco's level of committed sales through its sales contract portfolio). The graph illustrates the variability around the base case pre-tax net present value of $1.4 billion using sensitivities of plus and minus 10% on all variables. For uranium price, the high and low cases represent a plus or minus 10% deviation from the average spot price projections incorporated in the base case realized prices as shown in *Table 19.2*.

Figure 22-1: Cigar Lake Project Sensitivity Analysis



The Cigar Lake project shows relatively low sensitivity to changes in its operating or capital cost projections. The relative sensitivity to changes in uranium price and ore grade realized is significantly higher due in part to the relatively high-grade nature of the deposit and the price estimates being used, which are a reflection of the current U_3O_8 market environment.

22.3 Payback

Payback for the Cigar Lake project can be considered on many different factors.

Payback for Cameco, excluding all 2011 and prior costs as sunk costs, would be achieved during 2017 on an undiscounted, pre-tax basis.

If the $1.6 billion, including remediation costs, spent on Cigar Lake construction prior to 2012, (Cameco share equal to $796 million) were included in the calculation, Cameco would achieve payback during 2019 on an undiscounted, pre-tax basis.

22.4 Mine Life

The Cigar Lake project is based on the current Mineral Reserves that will produce 213.5 million mill recovered pounds of U_3O_8. The expected life of current estimated Mineral Reserves is approximately 15 years of sustained production based on the planned annual production of approximately 18 million pounds of U_3O_8. Cigar Lake will produce less than the full annual production in the early and late years of the Mineral Reserve life.

If the Mineral Resources are upgraded and then converted to Mineral Reserves through a positive feasibility study, this could extend the mine life. It cannot be assumed that all or any part of the Inferred Mineral Resources at Cigar Lake will ever be upgraded to a higher category. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

22.5 Taxes

The Cigar Lake project operates as an unincorporated joint venture and is therefore not subject to direct income taxation at the joint venture level. Cameco, as the mine operator, operates the mine on behalf of the CLJV and distributes the resulting U_3O_8 production to the CLJV partners in proportion to their joint venture interests.

Cameco is subject to federal and provincial (Saskatchewan and Ontario) income tax in Canada. Royalties are fully deductible for income tax purposes. For Ontario tax purposes, an additional tax is charged (at normal Ontario corporate tax rates) if the royalty deduction exceeds a notional Ontario resource allowance.

Cameco is no longer subject to capital taxes on paid-up capital (as defined for capital tax purposes in the relevant provincial legislation) in respect of its Canadian operations. These taxes have been eliminated. As a resource corporation in Saskatchewan, Cameco pays a corporate resource surcharge of 3.0% of the value of resource sales. *Table 22-2* below sets out the expected royalties and annual resource surcharge that will be incurred by Cameco on its share of production from Cigar Lake. The projected royalties and annual resource surcharge are based on the realized prices set out in *Table 19-2* and are quoted in constant 2012 dollars.

For the purposes of the economic analysis, the projected impact of income taxes has been excluded due to the nature of the required calculations. Taxable income for Cameco is comprised of results from several discrete operations, which are combined to determine Cameco's taxable income and its related tax liabilities. It is not practical to allocate a resulting income tax cost to Cameco's portion of Cigar Lake, as Cameco's tax expense is a function of several variables, most of which are independent of the investment in Cigar Lake. However, the projected future impact of the Saskatchewan corporate resource surcharge is included in the economic analysis.

22.6 Royalties

Cameco pays royalties to the Province of Saskatchewan on the sale of uranium extracted from ore bodies within the province under the terms of Part III of the Crown Mineral Royalty Schedule, 1986 (Saskatchewan) (the "Schedule"), as amended. The Schedule provides for the calculation and payment of both a basic royalty and a tiered royalty. The basic royalty is equal to 5% of gross sales of uranium and is reduced by the Saskatchewan resource credit, which is equal to 1% of the gross sales of uranium.

The tiered royalty is an additional levy on the gross sales of uranium, which applies only when the sales price of uranium exceeds levels prescribed by the Schedule. Uranium sales subject to the tiered royalty are first reduced by capital allowances, as permitted by the Schedule, for new mine or mill construction and certain mill expansion. Additions of capital allowances for new mines and mills are determined using amounts prescribed by the Schedule based on the design capacity of the new facility, and not on the actual construction costs. The aggregate of the allowances, less any allowance deductions, determines the balance in the capital recovery bank (CRB). When the allowable annual deduction from the CRB is fully maximized or the CRB is reduced to zero, tiered royalties become payable. Both the sales prices at which the tiered royalties become payable and the CRB, as defined in the Schedule, are adjusted annually to reflect changes in the Canadian gross domestic product.

The tiered royalty is calculated on the positive difference between the sales price per pound of U_3O_8 and the prescribed prices according to the following:

	Tiered Royalty rate	Canadian dollar ($/lb U_3O_8) Sales price in excess of:
	6%	$18.05
Plus	4%	$27.07
Plus	5%	$36.09

The above sales prices are applicable to 2011 and are in Canadian dollars. For example, if the sales price realized by Cameco was $40 per pound in Canadian dollars, the tiered royalty payable would be calculated as follows (assuming all capital allowances have been reduced to zero):

[6% x ($40.00 – $18.05) x pounds sold] + [4% x ($40.00 – $27.07) x pounds sold] + [5% x ($40.00 - $36.09) x pounds sold]

= $2.03 per pound sold

In 2007, Cameco's CRB was fully claimed and therefore Cameco was subject to tiered royalties starting in that year. Cameco will be eligible for additional capital allowances, as permitted by the Schedule, once Cigar Lake commences production. As a result, Cameco expects that the payment of tiered royalties relating to Cigar Lake will not be required until 2015.

Table 22-2 below sets out the expected royalties and annual resource surcharge that will be incurred by Cameco on its share of production from Cigar Lake. The projected royalties and annual resource surcharges are based on the realized prices set out in *Table 19-2* and are quoted in constant 2012 dollars.

The economic analysis for tiered royalties has been done on an incremental basis, and assumes that the capital bank additions to the CRB would only be used to offset the tiered royalties otherwise payable on Cameco's share of Cigar Lake production. In reality, the CRB will be available to shelter tiered royalties payable on all of Cameco's Canadian production centers, including Cigar Lake. As a result, the CRB will be exhausted in an accelerated fashion by the use of higher deductions in 2013 and 2014 to offset tiered royalties payable by Cameco from all of its Canadian production centers.

Table 22-2: Expected Royalties and Annual Resource Surcharge to be Incurred by Cameco for Cigar Lake

Royalties ($Cdn M)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Basic Royalty	0.6	4.8	13.7	20.2	21.4	23.6	24.3	24.4	24.7	25.5	21.0	22.3	26.2	26.3	14.2	293.2
Tiered Royalty	-	-	6.0	34.0	47.4	53.4	55.4	55.7	57.8	59.8	49.2	52.5	62.4	62.8	34.0	630.4
Resource Surcharge	0.5	3.6	10.3	15.1	16.0	17.7	18.2	18.3	18.5	19.1	15.7	16.8	19.6	19.7	10.7	219.8
Total Royalties	**$ 1.1**	**$ 8.4**	**$ 30.0**	**$ 69.3**	**$ 84.8**	**$ 94.7**	**$ 97.9**	**$ 98.4**	**$ 101.0**	**$ 104.4**	**$ 85.9**	**$ 91.6**	**$ 108.2**	**$ 108.8**	**$ 58.9**	**$ 1,143.4**

Note: Expected Royalties and Annual Resource Surcharge in *Table 22-2* are on Cameco's share of production only.

23 ADJACENT PROPERTIES

Information on adjacent properties is not applicable to this technical report since there are no adjacent properties with exploration results of note.

24 OTHER RELEVANT DATA AND INFORMATION

24.1 Cigar Lake Water Inflow Incidents

Over the period, 2006 through 2008, the project suffered several setbacks as a result of three water inflow incidents.

The first occurred in April of 2006 resulting in the flooding of the then partially completed Shaft No. 2. The two subsequent incidents involved inflows in the mine workings connected to Shaft No. 1 and resulted in flooding of the mine workings completed to that point in time.

Cameco developed and successfully executed recovery and remediation plans for both the Shaft No. 2 inflow and the 2 inflows experienced in Shaft No. 1 workings. This culminated in the resumption of sinking of Shaft No. 2 in the first half of 2011 and the successful break through to the 480 m level of the main mine workings in early 2012 and the commencement and completion of underground remediation and restoration of the Shaft No. 1 workings in 2010 and 2011.

The detailed phased remediation plan and its associated activities were described in the 2007 Technical Report and updated in the 2010 Technical Report.

24.2 Mine Inflow Remediation and Construction

Through 2010 and 2011, Cameco developed a comprehensive plan and successfully proceeded with remediation to restore the underground workings at Cigar Lake. The key aspects of that plan are described below.

Securing the Mine

This involved inspecting the mine and completing any additional remedial work to protect it from an inflow or significant ground failure (for example, determining if additional reinforcement was required in higher risk areas). The work to secure the mine was completed in 2011.

Underground Rehabilitation Program

With successful re-entry to the main mine workings achieved in early 2010, a comprehensive underground rehabilitation program was implemented through the period since the 2010 Technical Report. The program of work involved rehabilitating the remaining lower risk areas of the mine (including the 480 and 500 m levels) and re-establishing the full mine ventilation circuit. Some of the specific tasks included:

- re-establishing the permanent refuge stations and communications;

- installation of the emergency backup pumping capacity;
- re-establishing the orebody freezing program;
- commencing the Shaft No. 2 freezing program;
- preparing areas to resume construction/development activities; and
- replacing electrical components and equipment damaged due to flooding.

As part of securing the mine and underground rehabilitation program, detailed assessments of the underground conditions were completed which provided further input to the overall Cigar Lake design and strategy, allowing the mine plan to be further optimized.

Resumption of Construction Activities – Pre-Inflow

With the mine fully secured, the underground rehabilitation program complete and regulatory requirements met, Cameco resumed underground construction activities in 2011 that had been interrupted by the October 2006 water inflow.

24.3 Shaft No. 2 Inflow Remediation and Construction

Cameco completed the dewatering of Shaft No. 2 in April 2009 and remediation was completed in May 2009. The freezing infrastructure to support the completion of shaft sinking was completed in early 2011 and the freeze system activated. Shaft sinking resumed in the first half of 2011 and by early 2012, Cameco had achieved breakthrough to the 480 m level and sinking to completion (the 500 m level) continues. The breakthrough to the 480 m level provided for a second means of egress for the mine and for future increases in ventilation.

In 2011, a hydrostatic liner was installed in the shaft from the 368 m depth to the 480 m level, where it will transition back to a non-hydrostatic liner.

Cameco plans to complete Shaft No. 2 by the second quarter of 2013, taking the following steps:

- sinking the shaft from the current shaft bottom depth of 480 m to its final depth of 500 m – to be completed in 2012;
- establishing a shaft station at the 480 m level;
- installing shaft furnishings including construction of a concrete ventilation partition, installation of electrical cable, water services, ore slurry pipes and permanent service cage facilities; and
- commissioning of the shaft systems.

24.4 Implications and Learning

Throughout the entire water inflow remediation and rehabilitation, that successfully addressed all three incidents, Cameco identified and incorporated the lessons learned into all facets of the project. This was specifically done to ensure the implications not only to short-term project design, construction and startup were understood and addressed, but also to ensure that any lessons which are necessary to ensure the long-term success of operations were identified, where possible, and incorporated. These lessons included changes to the water management strategy, mine design, operational procedures and work management, project and operational leadership.

24.5 Preparation for Operations

In parallel to the extensive project work in place to design, construct and commission the Cigar Lake project, the preparation for operational startup, production rampup and long-term sustainable operations is fully underway. The key operations team is in place at Cigar Lake and working diligently to refine and execute the operations implementation plan. The team is made up of experienced Cameco personnel many of whom have worked at the Cigar Lake project and supported the successful remediation and rehabilitation of the mine. The team has also been strengthened by Cameco through the addition of both technical and operational personnel sourced from other areas of the mining and resource industry.

The operational implementation plan is a comprehensive plan, led by Cameco's Cigar Lake General Manager. It spans all aspects of the operation necessary to be in place from management systems, organization, resourcing and training of personnel, equipment operation and reliability systems, production planning and logistics management through to budget management.

A key component of the operational implementation plan is to assure the successful implementation of the jet boring system.

24.6 Project Risks

Cigar Lake is a challenging deposit to develop and mine. These challenges include control of ground water, weak rock formations, radiation protection, water inflow, mining method uncertainty, relatively thin flat lying mineralization and other mining-related challenges. The sandstone overlying the basement rock contains large volumes of water at significant pressure. Cameco is undertaking a number of initiatives to mitigate the project risks associated with mining the Cigar Lake deposit and to mine the deposit in a safe and economic manner including, but not limited to using the jet boring mining method, freezing of the orebody and surrounding ground, lowering the production horizon and increasing mine dewatering capacity. Cameco applies its operational experience and the lessons it has learned about water inflows at McArthur River and Cigar Lake to reduce risk.

Freezing the orebody and the surrounding ground is expected to result in several enhancements to the ground conditions, including: (1) minimizing the risk of water inflows from saturated rock above the unconformity; (2) reducing radiation exposure from radon dissolved in the ground water; and (3) increasing rock stability. However, freezing will only reduce, not eliminate, these challenges.

A significant risk to development and production is from water inflows. Despite the significant mitigation Cameco has put in place, including the incorporation of the learnings from the three inflows, there remains a possibility of a water inflow during the drilling of holes to freeze the ground, mine development and JBS mining. The consequences of another water inflow will depend upon the magnitude, location and timing of any such event, but could include a significant delay in Cigar Lake's development or production, a material increase in costs, a loss of Mineral Reserves or require Cameco to give notice to many of its customers that it is declaring an interruption in planned uranium supply. Such consequences could have a material adverse impact on Cameco. Water inflows are generally not insurable.

Cigar Lake's construction and production schedules are based upon certain assumptions including assumptions about the condition of the underground infrastructure at the mine. At the time of issuance of the 2010 Technical Report, re-entry to the 480 m levels had been established; however, the assessment of its condition was not completed until after the mine was secure. Cameco successfully secured the mine in 2010 and 2011 and conducted a thorough assessment of the underground conditions. The results were used to update the project plan and the evolution of the mine plan. Overall the conditions were found to be generally as expected.

The recovery of the flooded mine after the second mine inflow (2008) and the assessment of the 420 m level with respect to geotechnical and hydrostatic conditions, and associated risk, led Cameco to conclude that this level should be eliminated from any future mine plan. Actions to seal the level and backfill the 420 m level workings were put in place and successfully completed.

The assessment of the 465 m level with respect to geotechnical and hydrostatic conditions, and associated risk, led Cameco to conclude that any re-entry to the 465 m level, a level already eliminated from any future mine plan, was not appropriate from a risk perspective and actions to seal the level and backfill the 465 m level workings were immediately put in place and successfully completed. As development takes place on the 480 and 500 m levels, it is expected that localized areas of poor ground conditions may potentially be encountered which require modifications to the mine plan and project development schedules.

Cameco has noted a risk associated with the spalling and cracking of the tunnel segments in a short section of one of the crosscuts that were excavated in 1999. Cameco has taken steps to halt the deterioration and reinforced the affected area. Cameco notes that dispositioning of its third party geotechnical consultants' recommendations may result in the need to make minor revisions to modify the life-of-mine plan or segment design to ensure the portion of Mineral Reserves to be mined in this tunnel section are not negatively impacted.

The JBS mining method is new to the uranium mining industry and was developed and adapted specifically for the Cigar Lake deposit. Although Cameco has successfully demonstrated the JBS mining method in trials, this method has not been proven at full production. Test mining trials have been completed on a limited number of cavities that may not be representative of the deposit as a whole. As Cameco ramps up production, there may be some technical challenges, which could affect Cameco's production plans, including, but not limited to variable or unanticipated ground conditions, ground movement and cave ins, water inflows and variable dilution, recovery values and mining productivity. Even though enhancements have been made to the design of the JBS unit, there is a risk that the Cigar Lake project rampup to an annual production rate of approximately 18 million pounds U_3O_8 may take longer than planned. In addition, there is a risk that the Cigar Lake project may not be able to achieve the annual planned production rate of approximately 18 million pounds U_3O_8 on a sustained and consistent basis.

Despite the risks associated with this new mining method, Cameco continues to believe that the choice of the JBS mining method is prudent and practical. Cameco is confident that it will be able to solve challenges that may arise, but a failure to do so would have a significant impact on Cameco's business. A comprehensive JBS testing, pre-commissioning, commissioning and startup plan has been implemented to assure successful startup and ongoing operations.

The Cigar Lake mine plan requires four JBS units. Cameco currently has one unit and in 2011 agreed to purchase three additional units. Cameco has chosen to single source the manufacturing and supply of the JBS units to a European based, global mining and tunnelling, equipment supplier. The supplier has been working closely with Cameco through the past two decades of research, development and testing of the JBS mining method and associated equipment and process. There is a risk that rampup to full production at Cigar Lake may take longer than planned if the manufacture or delivery of these three additional JBS units does not take place as scheduled. As part of Cameco's startup plan noted above, Cameco is working with its supplier to assure timely delivery of these units.

The designed mine ventilation volume of 240 m^3/s is anticipated to provide sufficient airflow through the mine for use of diesel equipment and radiation protection at a sustained production rate of approximately 18 million pounds U_3O_8 per year. Should this volume of air prove inadequate for radiation protection at the designed production rate, the rate of production would be negatively impacted without additional capital expenditure to increase the ventilation throughput.

Metallurgical test work has been used to design the McClean Lake JEB mill circuits relevant to Cigar Lake ore and associated modifications. Samples used for metallurgical test work may not be representative of the deposit as a whole. It has been recommended that an ongoing sampling and metallurgical test work campaign be implemented to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation. If the test results show significant variation from the mill design criteria, this could impact operating costs and mill throughput.

Under the Memorandum of Agreement, the MLJV is required to further modify and expand the McClean Lake JEB mill to process and package all of Cigar Lake's current Mineral Reserves and the CLJV has agreed to pay for the capital costs to do so. Construction of the expanded facility is scheduled to begin in 2012 and be completed in 2015. Failure to complete construction of the expanded facility as planned could impact planned production.

Section 21 of this report contains estimates of capital and other costs, including the capital costs associated with the modification and expansion of the McClean Lake JEB mill. Actual costs may vary from estimates for a variety of reasons and there can be no assurance that cost estimates included in this report will be achieved.

Construction and production schedules could be impacted by regulatory approvals. Cameco has received from the CNSC a construction licence, which expires December 31, 2013, allowing for completion of the mine remediation plan, Shaft No. 2 and surface and underground construction. As a condition of the licence, certain activities require regulatory approval. Concurrent with the completion of the mine construction, an operating licence application will be prepared for submission to the CNSC. An amendment to the McClean Lake JEB mill's Licence to Operate is still required in order to process ore from Cigar Lake at the McClean Lake JEB mill. Delay in receiving regulatory approvals could impact the planned commencement of production in 2013. To date there have been no regulatory delays; however, the transition from construction to operations entails a series of regulatory approvals, including the intricacies of testing, commissioning and start up.

Working with the regulatory authorities to receive approvals for the actual execution of the work, including any changes related to the implementation of the revised mine plan, e.g. process infrastructure changes, may impact the production schedule and cost estimates.

The completion of engineering and construction and the startup of production at the Cigar Lake mine and the re-start of the McClean Lake JEB mill, is taking place in an environment of significant competition for resources. For example, in Western Canada, the northern development of Alberta oil sands combined with the growth in multiple aspects of Saskatchewan's economy, e.g. potash, have increased the risk of a shortage of personnel. People are core to Cameco's business. A shortage of personnel or an inability to acquire key construction and operational resources could result in delays to the construction schedule and the ability to successfully ramp up production.

The acceleration in the western Canadian economy can also introduce the risk of price increases for contractor and materials/supplies. An increase in prices for contractor and materials/suppliers could cause capital cost estimates to vary from those capital estimates referenced in Section 21 of this report.

24.7 Caution about Forward-Looking Information

This technical report includes statements and information about expectations for the future that are not historical facts. When we discuss Cameco's strategy, plans and future financial and operating performance, or other things that have not yet taken place, we are making statements considered to be forward-looking information or forward-looking statements under Canadian and US securities laws. We refer to them in this technical report as forward-looking information.

Key things to understand about the forward-looking information in this technical report:

- It typically includes words and phrases about the future, such as *believe, estimate, anticipate, expect, plan, intend, goal, target, forecast, project, scheduled, potential, strategy and proposed* or variations (including negative variations) of such words and phrases or may be identified by statements to the effect that certain actions, events or results, *may, could, should, would, will be or shall be taken, occur or be achieved*.
- It is based on a number of material assumptions, including those we have listed below, which may prove to be incorrect.
- Actual results and events may be significantly different from what is currently expected, because of the risks associated with the project and Cameco's business. We list a number of these material risks below. We recommend you also review other parts of this document, including Section 24.6 which outlines a number of key project risks, Cameco's Annual Information Form for the year ended December 31, 2011 under the headings "Caution about forward-looking information" and "Risks that can affect our business" and Cameco's annual Management's Discussion and Analysis for the year ended 2011 under the headings "Caution about forward-looking information" and "Development Project - Cigar Lake - Managing our risks", which include a discussion of other material risks that could cause actual results to differ from current expectations.

Forward-looking information is designed to help you understand current views of the qualified persons and management of Cameco. It may not be appropriate for other purposes. Cameco and the qualified persons will not necessarily update this forward-looking information unless it is required to by securities laws.

Examples of forward-looking information in this Technical Report

- Cameco's plans and expectations for the Cigar Lake project;

- results of the economic analysis, including but not limited to forecasts of uranium price, net present value, internal rate of return, cash flows and sensitivity analysis;
- estimates of capital, operating, sustaining and mine reclamation and closure costs;
- mineral resource and mineral reserve estimates;
- expected benefit of milling Cigar Lake ore at the McClean Lake JEB mill;
- Cameco's plans to begin commissioning in ore in mid-2013, with the first pounds to be packaged at the McClean Lake JEB mill in the fourth quarter of 2013;
- Cameco's belief that the JBS mining method will be successful and in its ability to solve technical challenges with the JBS mining method that may arise;
- forecasts relating to mining, development and other activities including but not limited to mine life, production and rampup forecasts;
- Cameco's expectation that all necessary regulatory permits and approvals will be obtained to meet its future annual production targets;
- future royalty and tax payments and rates; and
- timing for completion of construction of Seru Bay infrastructure, McClean Lake JEB mill expansion and modifications and optimization of the McClean Lake JEB mill tailings facility.

Material assumptions

- there is no material delay or disruption in Cameco's plans as a result of ground movements, cave ins, additional water inflows, a failure of seals or plugs used for previous water inflows, natural phenomena, delay in acquiring critical equipment, equipment failure or other causes;
- there are no labour disputes or shortages;
- all necessary contractors, equipment, operating parts, supplies, regulatory permits and approvals are obtained when they are needed;
- processing plants are available and function as designed and sufficient tailings capacity is available;
- Cameco's expectation that the new milling arrangement will result in the expected reduction in the operating cost;
- Cameco's mineral resource and mineral reserve estimates and the assumptions they are based on are reliable (See Sections 14.2 and 15.2);
- Cigar Lake development, mining and production plans succeed;

- Cameco's expectation that the jet boring mining method will be successful and that it will be able to solve technical challenges as they arise; and
- Cameco's expectation that it will be able to obtain the additional jet boring system units it requires on schedule.

Material risks

- an unexpected geological, hydrological, underground condition or an additional water inflow, further delays Cameco's progress;
- ground movements and cave ins;
- the necessary regulatory permits or approvals cannot be obtained or maintained;
- natural phenomena, labour disputes, equipment failure, delay in obtaining the required contractors, equipment, operating parts and supplies or other reasons cause a material delay or disruption in Cameco's plans;
- processing plants are not available or do not function as designed and sufficient tailings facility capacity is not available;
- the new milling arrangement does not result in the expected cost savings or other benefits;
- mineral resource and mineral reserve estimates are not reliable; and
- Cameco's development, mining or production plans for Cigar Lake are delayed or do not succeed for any reason, including technical difficulties with the jet boring mining method or Cameco's inability to acquire any of the required jet boring equipment.

25 INTERPRETATION AND CONCLUSIONS

The Cigar Lake project outlined in this report represents a significant economic source of feed material for the McClean Lake JEB mill. With an estimated operating mine life of 15 years, Cigar Lake is expected to produce an estimated 213 million pounds of U_3O_8. At the forecast average realized uranium price over this 15 year period, it is estimated that Cameco will receive substantial positive net cash flows from its share of Cigar Lake production.

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, for net cash flows January 1, 2012 forward, of $1.4 billion for its share of the Cigar Lake Mineral Reserves. The pre-tax IRR, also calculated from January 1, 2012, is estimated to be 32.8%. A sensitivity analysis of the Cigar Lake project economics demonstrates that the project generates positive cash flows in various scenarios, including assumptions of higher costs, lower revenues, or lower ore grades.

The aggregate capital and other costs for construction spent by the CLJV, including costs prior to December 31, 2011 of $1.6 billion, is estimated to be approximately $2.6 billion, an increase of $523.9 million over the cost estimate disclosed in the 2010 Technical Report. The cost increase is primarily the result of the implementation of the surface freeze strategy, general cost escalation, cost to upgrade and expand the McClean Lake mill and improvements to the mine plan. Despite these increases to the project cost, the economics for the project remains positive.

Cameco's share of the remaining capital and other costs to complete the Cigar Lake project is $483.6 million, including $428.9 million of capital costs and $54.7 million of standby costs. Including the $675.3 million spent by Cameco on construction costs and mill modification costs prior to December 31, 2011, Cameco's share of the aggregate capital cost is now estimated to be $1.1 billion ($192 million over the 2010 Technical Report). In addition, Cameco's share of the projected sustaining capital expenditures is $188.6 million.

The Cigar Lake project shows relatively low sensitivity to changes in its operating or capital cost projections. The relative sensitivity to changes in uranium price and ore grade realized is significantly higher due in part to the relatively high-grade nature of the deposit and the price estimates being used, which are a reflection of the current U_3O_8 market environment.

The development and construction of the project has been interrupted by two major water inflow incidents in 2006 and one major water inflow in 2008 that resulted in the flooding of the partially completed Shaft No. 2 and the underground workings. These incidents stopped all underground excavation and construction activities. Despite these setbacks, Cameco moved forward and developed and successfully implemented a remediation plan to allow the resumption of pre-inflow activities at the mine. Work is proceeding across all fronts to begin commissioning in ore in mid-2013.

Cameco revised its mine plan building on the lessons learned through the successful inflow remediation, geotechnical, geological, hydrogeological assessments, experience gained from the inspection of the underground workings after successful mine re-entry and learnings from other Cameco operations. These revisions to the mine plan include expanded ground freezing, the introduction of both surface and underground freezing in a hybrid approach and the backfilling of the 420 m level and the 465 m level, amongst many improvements in design and strategy. The installed pumping capacity has been expanded, and expansions in water treatment and surface storage capacity provide for an enhanced water management system. In addition, Cameco has implemented enhanced procedural controls and technical risk assessments for mine development and demonstrated their successful application in the underground development completed to date. These and other actions are expected to reduce the risk of any future inflows. Cameco is also employing a strategy of bulk freezing the ore zone prior to the commencement of production mining in a given area.

The revised mine plan, successfully implemented remediation program and the comprehensive construction and operational startup plans are anticipated to maintain the original objectives of the Cigar Lake project, to achieve:

- a positive economic outcome;
- a planned annual production of approximately 18 million pounds of U_3O_8; and
- over 200 million pounds of production.

There are a number of risks and challenges associated with developing and mining Cigar Lake, which are discussed in Section 24.6. The construction schedule, the planned commencement of production in 2013, and the cost estimates assume that Cameco will be able to successfully mitigate project risk. Cameco believes it will be able to do so.

Many aspects of the Cigar Lake project are based on the designs that have been proven and are being successfully used at the McArthur River mine. One of the challenges of mining the Cigar Lake deposit is radiation control due to its high grade. Cameco has been producing ore with similar high grades from the McArthur River mine since 1999. The experience from McArthur River has been used extensively in the design of the Cigar Lake project. These designs include remote mining for radiation protection, ground freezing for control of radon gas and water inflows, underground grinding of the ore and hydraulic hoisting to surface. The incorporation at Cigar Lake of these designs and practices proven to be successful at the McArthur River mine significantly reduces the risk in numerous aspects of the Cigar Lake project.

The JBS mining method is new to the uranium mining industry and was developed and adapted specifically for the Cigar Lake deposit. The JBS mining method planned for Cigar Lake has been successfully tested with prototype equipment and the mining plan has been engineered to suit this method. Because of the high grade of the ore the actual ore tonnage requirements to be mined per day to meet the U_3O_8 production requirement are modest, ranging between 100 and 140 t/d at full production of approximately 18 million pounds of U_3O_8 per year. In general, the projections for jet boring productivity are considered to be realistic.

Although Cameco has successfully demonstrated the JBS mining method in trials, this method has not been proven at full production. Test mining trials have been completed on a limited number of cavities that may not be representative of the deposit as a whole. As Cameco ramps up production, there may be some technical challenges, which could affect Cameco's production plans, including, but not limited to, variable or unanticipated ground conditions, ground movement and cave ins, water inflows and variable dilution, recovery values and mining productivity. Even though enhancements have been made to the design of the JBS unit, there is a risk that the ramp up to the full production rate may not be achieved on a sustained and consistent basis.

Despite the risks associated with this new mining method, Cameco continues to believe that the choice of the JBS mining method is prudent and practical. Cameco is confident that it will be able to solve challenges that may arise, but a failure to do so would have a significant impact on Cameco's business. Cameco has implemented a comprehensive JBS testing, pre-commissioning, commissioning and startup plan to assure successful startup and on-going operations.

Metallurgical test work has been used to design the McClean Lake JEB mill circuits relevant to Cigar Lake ore and associated modifications. Samples used for metallurgical test work may not be representative of the deposit as a whole. Additional sampling and metallurgical test work will be required to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation.

Approximately half of the drilling results used to define the Cigar Lake deposit were completed between 1981 and 1998 by SERU, a predecessor of AREVA, and CLMC prior to Cameco becoming operator in January 2002. Cameco has included this information in the drillhole data base that was used as the basis of the Mineral Resource and Mineral Reserve estimates. Cameco has performed a summary audit of the data received from CLMC, is satisfied with the quality of the data and considers it valid for use in the estimation of the Mineral Resources and Mineral Reserves along with the drilling results that Cameco has collected since 2002.

Substantial quantities of underground drilling through the deposit have been completed for geotechnical and freezehole drilling. The core from the geotechnical holes has been logged, assayed, and results have been incorporated into the Mineral Resource and Mineral Reserve estimates. Most freezeholes are percussion holes so no core is available from them, however, they are probed using in-hole loggers for radiometric grade data. This data is a valuable source of information and has become part of the resource data base.

The Cigar Lake deposit contains an estimated Inferred Mineral Resource of 124.4 million pounds of U_3O_8 with an estimated grade of 12.6% U_3O_8. This represents significant exploration potential and, if these Inferred Mineral Resources could be upgraded to Mineral Reserves, it is possible they could be mined from the existing and future shafts and supporting facilities of the Cigar Lake site. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

26 RECOMMENDATIONS

Based on its confidence in its updated mine design and mining plan, successful mine remediation and construction performance (both underground and surface) to date and a positive economic analysis, Cameco plans to continue to proceed through construction to production as described in this technical report.

Cameco has continued to assess lessons learned and sought opportunities to improve the project in many areas including design, engineering, and construction and operational strategy. In addition, Cameco has implemented enhanced procedural controls and technical risk assessments for mine development. Cameco is focused on the assurance of success of its project and operational execution.

Cameco successfully completed and received approval for the environmental assessment to discharge all treated effluent (except sewage) through two pipelines directly to a single location in Seru Bay of Waterbury Lake and is currently completing the construction and commissioning of this system.

Cameco successfully tested and has implemented an innovative surface freeze strategy to further assure successful startup and production. Cameco intends on using this approach for the freezing of initial ore mining panels.

Cameco has in place a comprehensive operational implementation program which focuses on the implementation of the JBS mining system. This includes the training of personnel prior to start up of operations, surface and underground testing, and reliability planning and implementation to assure as effective and efficient a startup, as possible.

Cameco is ensuring that systems, tools and personnel resources are enhanced and assessed for sufficiency, on a periodic basis, to assure the successful delivery of the project from engineering through field execution. Cameco continues to seek opportunities to integrate learnings from the project and its other operating divisions to assure a successful project.

In connection with a regulatory requirement, Cameco retained an independent engineering consultant to perform a technical review of the Cigar Lake mine design. A number of recommendations and suggestions for follow-up were included in the report provided by the consultants in the areas of geological interpretation, hydrogeological modelling, ground freezing, geotechnical data interpretation and ground stability assessment. Cameco has implemented an action plan to address such recommendations and suggestions in a timely manner.

Cameco plans to continue to systematically collect density samples from current and future core drilling programs to add samples to the current density database. The additional samples will be used to further improve the density estimation formulas for Mineral Resource estimation.

A drill program was proposed and initiated in 2011 for the western portion of the Phase 2 area with the goal of confirming the quantity of Mineral Resources as well as the potential to upgrade the category of such Mineral Resources. Following the completion of the current drill program (early-2012), Cameco plans to create a 3-dimensional block model for the Phase 2 area that will incorporate the latest geological interpretation and up-to-date structural information. This model will be used to update the Mineral Resource estimate and provide a basis for a scoping study to assess possible development options.

Additional drilling from surface or underground will be required to upgrade the Phase 1 Inferred Resources. No surface delineation drilling over Phase 1 is planned at this time. Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources at Cigar Lake will ever be upgraded to a higher category.

Metallurgical test work has been used to design the McClean Lake JEB mill circuits relevant to Cigar Lake ore and associated modifications. Samples used for metallurgical test work may not be representative of the deposit as a whole. It is recommended that an ongoing sampling and metallurgical test work campaign be implemented to verify the consistency of recoveries at the McClean Lake JEB mill and to address the potential impacts of ore variability on the mill design and operation.

In order to execute the Cigar Lake project plans while mitigating risks, the proposed expenditures set out in *Tables 21-1*, *21-2* and *21-3* of this report are necessary and endorsed by the authors of this technical report.

The authors of this technical report concur with, and recommend that Cameco proceed with, the foregoing plans and actions.

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28 DATE AND SIGNATURE PAGE

This technical report titled "Cigar Lake Project, Northern Saskatchewan, Canada" dated February 24, 2012, with an effective date of December 31, 2011, has been prepared by or under the supervision of the undersigned qualified persons within the meaning of NI 43-101.

Signed,

"signed and sealed" February 24, 2012
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