CAMECO CORP
Form 6-K
February 18, 2009

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
FORM 6-K
Report of Foreign Private Issuer
Pursuant to Rule 13a-16 or 15d-16 Under
the Securities Exchange Act of 1934
For the month of February, 2009
(Commission file No. 1-14228)
Cameco Corporation
(Translation of registrant s name into English)
2121-11th Street West
Saskatoon, Saskatchewan, Canada S7M 1J3
(Address of Principal Executive Offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F o Form 40-F þ

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): o

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): o

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes o No þ

If Yes is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b):

Exhibit Index

Exhibit No.	Description
99.1	McArthur River Technical Report dated February 16, 2009

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: February 18, 2009

Cameco Corporation

By: /s/ O. Kim Goheen
O. Kim Goheen
Senior Vice-President and
Chief Financial Officer

Exhibit 99.1

McArthur River Operation
Northern Saskatchewan, Canada
National Instrument 43-101
Technical Report
Effective Date: December 31, 2008
Filed on February 16, 2009

Prepared for:
Cameco Corporation

Qualified Persons:
David Bronkhorst, P.Eng.
Charles R. Edwards, P.Eng.
Alain G. Mainville, P.Geo.
Gregory M. Murdock, P.Eng.
Leslie D. Yesnik, P.Eng.

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McARTHUR RIVER OPERATION, NORTHERN SASKATCHEWAN, CANADA
NI 43-101 TECHNICAL REPORT

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Units of Measure and abreviations

a	Annum (year)
BTU	British Thermal Unit
BTU/h	British Thermal Units per hour
%	Percent
°	Degrees
°C	Degrees Celsius
cm	Centimetres
CNSC	Canadian Nuclear safety Commission
cps	Counts per Second
d	Day
g	Grams
g/cm^3	Grams per cubic centimetre
g/m^3	Grams per cubic metre
GHM	Ground Hazards Model
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%U	metres times per cent uranium
$m\%U_3O_8$	metres times per cent uranium oxide
masl	Metres above sea level (elevation)
mm	Millimetres
Mo	Molybdenum
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
P_{80}	80% passing (particle size nomenclature)
RMR	Rock Mass Rating
Se	Selenium
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	Triuranium octoxide (yellowcake)
%U_3O_8	Percent triuranium octoxide (%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
W/W%	per cent solids by weight
>	Greater than
<	Less than

1 SUMMARY

McArthur River in northern Saskatchewan is an underground uranium mine, in which Cameco Corporation (Cameco) has a direct and indirect ownership interest of 69.805%. It contains the world s largest known high-grade uranium deposit and has produced 150 million pounds of U_3O_8 since the start of production in 1999. McArthur River is owned by joint venture partners Cameco (55.844%), AREVA Resources Canada Inc. (AREVA) (16.234%) and UEM Inc. (27.922%), a company equally owned by Cameco and AREVA. Cameco is the operator.

At December 31, 2008, the Company s share of estimated Proven and Probable Reserves was 509,000 tonnes of ore containing 232.2 million pounds U_3O_8 with an average grade of 20.7% U_3O_8, its share of estimated Measured and Indicated Resources was 173,700 tonnes containing 34.7 million pounds U_3O_8 with an average grade of 9.1% U_3O_8, and its share of estimated Inferred Resources was 448,600 tonnes containing 97.0 million pounds U_3O_8 at an average grade of 9.8% U_3O_8. A breakdown of the Mineral Reserve and Mineral Resource estimates is set out in Table 1-1 and Table 1-2.

Annual production rate from McArthur River is forecast at 18.7 million pounds until 2016, and declines thereafter until 2033. Cameco estimates that, based upon the current Mineral Reserves only, McArthur River will have a mine life of at least 25 years, with an expected payback of capital invested by 2010, on an undiscounted pre-tax basis. Mineral resources are not included in the Life of Mine plan, however, any Mineral Resources that are upgraded to Mineral Reserves in the future would be used to both extend the years the mine produces at 18.7 million pounds and potentially extend mine life.

This technical report has been prepared for Cameco by, or under the supervision of, internal qualified persons and an external qualified person in support of disclosure of scientific and technical information relating to the McArthur River operation.

1.1 Property Tenure

The mineral property consists of one mineral lease, totalling 1,380 hectares, and 21 mineral claims totalling 83,438 hectares. The mineral lease and mineral claims are contiguous. The McArthur River uranium deposit is located in the area subject to mineral lease ML-5516. The right to mine this uranium deposit was acquired by Cameco under this mineral lease. The current mineral lease expires in March 2014 with a right to renew for successive 10 year terms absent a default by Cameco. Title to the 21 mineral claims is secured until 2017 as a result of previous assessment work completed by Cameco.

The surface facilities and mine shafts for the McArthur River operation 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 agreement was signed in April 1999 and has a term of 33 years. Upon termination or expiry of the surface lease, a new surface lease can be entered into until full property decommissioning and reclamation has been achieved. The McArthur River surface lease presently covers approximately 651 hectares.

1.2 Location and Site Description

The McArthur River minesite is located near Toby Lake in northern Saskatchewan, approximately 620 km north of Saskatoon. The McArthur River mine site is compact, occupying approximately an area of one kilometre in the north/south direction and half a kilometre in the east/west direction. The site consists of an underground mine, one full service shaft and two ventilation shafts along with numerous surface facilities, including inert waste rock stockpiles, a large capacity mine water treatment plant, a pump hose, ponds, standby diesel generators as well as maintenance and warehousing facilities.

The means of access to the McArthur River property is by an all-weather road and by air. All supplies to the site and shipment of product are transported by truck year round. An 80 km all weather gravel road runs between the mine site and the Key Lake milling operation.

The topography and the environment are typical of the taiga forested lands common to the Athabasca basin area of northern Saskatchewan. The surface facilities are at an elevation of approximately 550 masl.

The site is connected to the provincial electricity grid with standby generators installed in case of grid power interruption.

Personnel are flown to site from the northern area communities and major Saskatchewan population centres such as Saskatoon. Underground development and construction is performed by a number of contractors. Cameco personnel conduct all production functions.

McArthur River is a developed producing property, with surface right holdings that cover all of its mining operation needs as well as requirements for residences, access to water, airport, site roads and other necessary buildings and infrastructures. No tailings management facilities are required as McArthur River ore is sent to the Key Lake mill for processing.

1.3 Geology and Mineralization

The McArthur River deposit is located in the south-eastern portion of the Athabasca Basin, within the south-west part of the Churchill structural province of the Canadian Shield. The crystalline basement rocks underlying the deposit are members of the Aphebian Wollaston Domain, metasedimentary sequence. These rocks are overlain by flat lying sandstones and conglomerates of the Helikian Athabasca Group. These sediments are over 500 m thick in the deposit area.

High grade uranium mineralization has been delineated from surface drilling over a strike length of 1,700 m, occurring at depths ranging between 500 m to 640m below surface. Underground drilling programs have covered approximately 750 m of the 1,700 m strike length delineated from surface. Ore widths are variable along strike but the most consistent, high grade mineralization occurs proximal to the main graphitic thrust fault around the nose of the upthrust basement rock. Less consistent and generally lower grade mineralization occurs down dip along this fault contact between basement rock and sandstone.

Four distinct mineralized zones, identified as Zones 1, 2, 3 and 4, have been defined to date. Two additional Zones, A and B, are on the northern portion of the deposit and are indicated through surface drill holes only.

The P2 thrust fault is the most important mineralization control for the McArthur River deposit. Uranium occurs in both the Athabasca sandstone and the overlying basement rock near the main zone of thrust faulting. Mineralization is generally within 15 m of the basement/sandstone contact with the exception of Zone 2. Less significant zones of mineralization may occur further from the contact, usually in the sandstone, associated with subsidiary fracture/fault zones or along the margins of flat lying siltstone beds.

Zone 2 mineralization occurs deeper in the basement rocks in a unique area of the deposit. Here a footwall quartzite unit lies in close proximity to the main zone of thrust faulting. In this area of structural disruption, high-grade mineralization occurs not only in the hanging wall basement wedge but also overlies the footwall quartzite unit. The strike extent of this deeper basement mineralization is approximately 100 m.

In general, the high-grade mineralization, characterized by botryoidal uraninite masses and subhedral uraninite aggregates, constitutes the earliest phase of mineralization in the deposit. Pyrite, chalcopyrite, and galena were also deposited during this initial mineralizing event. Later stage, remobilized uraninite occurs as disseminations, veinlets, and fracture coatings within chlorite breccia zones and along the margins of silt beds in the Athabasca sandstone.

1.4 Mineral Resources and Mineral Reserves

The Mineral Resource and Mineral Reserve estimates are based on 36 drillholes from surface, of which 15 drillholes intersected mineralization, and 632 drillholes from underground, of which 334 holes intersected mineralization.

A summary of the estimated Mineral Resources for McArthur River with an effective date of December 31, 2008 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 and Mineral Reserve estimates.

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Table 1-1: Summary of Mineral Resources December 31, 2008

Category	**Tonnes (x 1000)**	**Grade % U_3O_8**	**Contained Lbs U_3O_8 (millions)**	**Cameco s Share Lbs U_3O_8 (millions)**
Measured	209.0	9.20	42.4	29.6
Indicated	39.8	8.37	7.4	5.1
Total	**248.8**	**9.07**	**49.7**	**34.7**
Inferred	642.6	9.81	139.0	97.0

Notes:

(1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves.

(2) Cameco s share is 69.805 % 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 economically. It

cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

(4) Mineral Resources have been estimated at a minimum mineralized thickness of 1.0 m and at cut-off grade of 0.1% to 0.5 % U_3O_8.

(5) The geological model employed for McArthur River involves geological interpretations on section and plan derived from surface and underground drillhole information.

(6) The Mineral Resources have been estimated with no allowance for dilution material and mining recovery.

(7) Mineral Resources were estimated on the assumption of using the raisebore, boxhole and blasthole stoping mining methods combined with

freeze curtains.

(8) Mineral Resources were estimated using cross-sectional method and 3-dimensional block models.

(9) Environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues are not expected to materially affect the above estimate of Mineral Resources.

(10) Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

(11) Totals may not add up due to rounding.

A summary of the estimated Mineral Reserves with an effective date of December 31, 2008 is shown in Table 1-2.

Table 1-2: Summary of Mineral Reserves December 31, 2008

Category	**Tonnes (x 1000)**	**Grade % U_3O_8**	**Contained Lbs U_3O_8 (millions)**	**Cameco s Share Lbs U_3O_8 (millions)**
Proven	449.2	17.18	170.1	118.8
Probable	280.0	26.33	162.5	113.4
Total	**729.2**	**20.69**	**332.6**	**232.2**

Notes:

(1) Lbs U_3O_8 are those contained in Mineral Reserves and are not adjusted for the estimated metallurgical recovery of 98.4 % .

(2) Cameco s share is 69.805 % of total Mineral Reserves.

(3) McArthur River Mineral Reserves have been estimated at a cut-off grade of 0.8% U_3O_8.

(4) The geological model employed for McArthur River involves geological

interpretations on section and plan derived from surface and underground drillhole information.

(5) Mineral Reserves have been estimated with an average allowance of 20% dilution from backfill mined.

(6) Mineral Reserves have been estimated based on 95% mining recovery.

(7) Mineral Reserves were estimated based on the use of the raisebore, boxhole and blasthole stoping mining methods combined with freeze curtains. All material extracted by mining is radiometrically scanned for grade and that which is greater than 0.8% U_3O_8 is treated as ore and is fed to an initial processing circuit located underground consisting of grinding to produce an ore slurry which is hoisted

hydraulically by pumps to surface. On surface the ore slurry is transported to the Key Lake mill for final processing and production of uranium. The mining rate is planned to vary between 110 and 130 t/d at a full mill production rate of 18.7 million pounds U_3O_8 per year based on 98.4% mill recovery.

(8) Mineral Reserves were estimated using a 3-dimensional block model.

(9) For the purpose of estimating Mineral Reserves in accordance with NI 43-101, an average price of US$47/lb U_3O_8 was used. For the purpose of estimating Mineral Reserves in accordance with US Securities and Exchange Commission s Industry Guide 7, an average price of US$70/lb U_3O_8 was used.

Estimated Mineral Reserves are similar at either price because of the insensitivity of the Mineral Reserves to the cut-off grade over the range of these two prices.

(10) The key economic parameters underlying the Mineral Reserves include a conversion from US$ dollars to Cdn$ dollars using a fixed exchange rate of US$1.00 = Cdn$1.22.

(11) Environmental, permitting, legal, title, taxation, socio-economic, political, marketing, or other issues are not expected to materially affect the above estimate of Mineral Reserves.

(12) Totals may not add up due to rounding.

The current mine plan has been designed to extract all of the current Mineral Reserves. Over the last five years, the reconciliation of the mine production has been within 5% of the Mineral Reserve estimates of contained pounds of uranium.

Mineral Resources in the Measured, Indicated and Inferred Mineral Resource categories have not been included in the current mine plans. Mineral Resources have no demonstrated economic viability.

1.5 Exploration of the McArthur River Deposit

Cameco, through its predecessor company, the Saskatchewan Mining Development Corporation (SMDC), became operator of the McArthur River project in 1980. Surface exploration programs, ranging from small line cutting crews to large helicopter supported drilling and prospecting camps, were active from 1980 through to 1992. The mineral property presently consists of 84,818 ha.

Surface exploration programs were active from 1980 through to 1992. Significant mineralization of potentially economic uranium grades were first discovered as a result of surface drilling in the 1988 and 1989 exploration seasons.

In the summer of 1988, drilling along the northern portion of an electromagnetic conductor encountered structural disruption and sandstone alteration in hole MAC-195. The last hole of the year, MAC-198, encountered the contact between the overlying sandstone and basement rock (unconformity) much higher than expected, but 65 m deeper it passed back into sandstone and intersected a 10 m thick zone of high grade mineralization along the faulted basement/sandstone contact. Subsequent surface drilling programs in 1989, 1990, 1991, and 1992 delineated the mineralization over a strike length of 1,700 m, occurring at depths ranging between 500 to 640m below surface.

In 1993, an underground exploration program, consisting of shaft sinking, lateral development, and diamond drilling was approved by government agencies. The shaft was completed in 1994. Following review of the environmental impact statement, public hearings, and receipt of approvals from the governments of Canada and Saskatchewan, the Atomic Energy Control Board (AECB) issued construction licences for McArthur River in August 1997 and May 1998. In October 1999, Cameco received an operating licence from federal authorities and operating approval from provincial authorities.

Construction and development of the McArthur River mine was completed on schedule and mining commenced in December 1999. Commercial production was achieved on November 1, 2000.

Since 1993 over 630 underground drill holes, totalling in excess of 56,000 m, have provided detailed information for delineation of 750 m of the strike length. Over 1,400 additional underground diamond drill holes, totalling 85,000 m, were drilled for geotechnical information; probe and grout covers; service and drain holes; and freeze holes.

Underground exploration drilling and development continued in 2008. Activity for 2009 focuses on evaluation of Mineral Resources, mainly to the south of the current McArthur River Mineral Reserves. In 2008, Cameco concluded that Mineral Resources to the south of the mine have greater near-term development potential for future mining due to established infrastructure and were made a higher priority exploration target. Mineral Resources to the north of the mine are planned for further evaluation in either late 2009 or 2010, depending on the progress made in the south of the mine.

1.6 Exploration of P2 Grid

The McArthur River deposit, originally called P2 North, is on the P2 grid situated on the north western boundary of the property. Other significant, but sub-economic discoveries, which are located on the property include the Harrigan Zone, the BJ Zone, and P2 Main.

Routine prospecting in 1980 and 1981 discovered radioactive boulders about 10 km southwest of the McArthur River deposit. Exploration on the P2 grid accelerated in 1984 and definition of the P2 electromagnetic conductor, identified by reconnaissance geophysical surveys, was completed in 1986. The open ended conductor extended for 12 km on the property and became a high priority exploration target.

In 1985, drilling on the P2 conductor resulted in the discovery of the P2 Main sandstone hosted mineralization, associated with a major fault zone. Continued drilling through to 1988 defined this 500 m long, sub-economic zone of mineralization.

Exploration focus shifted to the P2 North area in 1988, with the discovery of high grade mineralization (4.3% U_3O_8 / 10.0 m) in drill hole MC-198. Successive diamond drill programs from 1989 91, totalling 27,928 metres in 43 holes, delineated the P2 North uranium deposit from surface. Subsequent geotechnical and hydrological evaluation of the deposit area in 1992 preceded the approval for underground development in 1993.

Surface exploration drilling was conducted in 2004, 2005 and 2006 to the north to test the extension of mineralization previously identified from historical surface drill holes and to also test new targets along strike. In 2007, surface diamond drilling to evaluate the P2 trend north of the McArthur River mine was significantly accelerated in order to understand as quickly as possible the full potential of the prolific P2 structure. As at December 31, 2008, approximately 80 surface drill holes totalling in excess of 42,000 m, comprising a combination of conventional and directional drilling have tested the P2 structure at approximately 200 m intervals for a distance of 4.3 km north of the mine. Results continue to be encouraging and will require follow-up drilling. For 2009, $3.5 million has been budgeted towards diamond drilling on extension of the P2 fault both to the north and south of the mine.

1.7 Mining Methods

The mining of the McArthur River deposit faces a number of challenges including control of groundwater, weak rock formations, and radiation protection from very high grade uranium ores. Based on these challenges, it was identified during initial mining studies that non-entry mining methods would be required to mine the majority of the deposit.

The sandstones that overlay the ore zones and basement rocks contain significant amounts of high pressure water that will flow into the underground workings unless they are controlled. Ground freezing is used to form an impermeable freeze wall, to prevent water from the sandstones entering into the active ore zones, and to help stabilize highly fractured footwall rocks during mining operations.

The raisebore mining method was selected as an innovative approach to meet these challenges and was adapted to meet the conditions at the McArthur River mine. The raisebore method involves drilling a series of raisebore holes through the ore zone. The ore is collected by remote controlled scooptrams at the bottom of the raise. Once the raise is completed, the raise is concrete filled.

This method has been used to extract all the ore at McArthur River since mine production started in 1999. The method has proven to be very successful both in terms of achieving budgeted production and safety goals including low accident frequency and radiation exposure.

Alternate mining methods planned for other Zones of the ore body include boxhole boring and blasthole stoping.

In 2005, a mining method study determined that a modification to this method, the boxhole mining method, would be better suited for the Upper Zones 1, 3 and 4 because it would allow development from a preferred location within the basement rockmass since this zone is overlain by water bearing sandstones. Cameco plans to use this method for production from Upper Zone 4 beginning in 2013.

Boxhole boring is a vertical development technique used at a few mines in the world; however, this will represent its first application to uranium mining. Cameco has some experience with boxhole boring as it previously tested the method at Rabbit Lake and Cigar Lake. Additional testing at McArthur River will be required to evaluate the productivity of this method, and will likely require additional operational development during test work and initial mining phases.

The technical challenges associated with this mining method include reaming through frozen ground, raise stability (due to thawing from reaming and backfill), controlling raise deviation, reaming through backfilled raises, and control of radiation exposure. Accordingly, Cameco has scheduled a long lead-time for implementation to ensure the technical challenges are understood and risks mitigated. Until Cameco has fully developed and tested the boxhole boring method at McArthur River, there is uncertainty in the estimated productivity.

Cameco plans to develop and test the boxhole boring method over the next four years. In 2006, Cameco placed an order for a boxhole borer for delivery in the first half of 2008 and in 2007 completed the mine plan for the boxhole boring test area. The first test raise was setup at the end of 2008 and pilot hole drilling commenced in January 2009. Three raises in waste are planned for 2009 as is completion of freeze drilling for a boxhole boring ore extraction test area. The brine distribution system for this area is scheduled to be installed in 2009 as part of the plan to test this method in ore in 2010. Cameco has CNSC approval for the boxhole boring test program in waste and will provide a second submission for boxhole boring in ore planned for 2010.

A third mining method, blasthole stoping is being evaluated for small isolated ore zones where raisebore or boxhole boring is impractical. McArthur River plans to implement this method for ore remnant recovery in Zone 2, pending regulatory review and approval.

1.8 Mine Operations

Underground exploration drilling has identified four mineralized zones (Zones 1 to 4). Cameco is working on the transition to new mining zones at McArthur River, including mine planning and development. Since mining startup in 1999, only Zone 2 has been mined. Zone 2 is divided into four Panels (1, 2, 3, and 5).

As extraction of Zone 2 (Panels 1, 2, and 3) progresses, Cameco expects to place Lower Zone 1, Zone 2 (Panel 5) and the lower mining area of Zone 4 into production in stages between 2009 and late 2010, subject to regulatory approval. Cameco plans to continue to use the raisebore mining method to extract ore in these zones.

Freeze drilling and raisebore access for Lower Zone 1 has been developed on the 530L. Due to water risks, the 560 level extraction chamber development will not be driven until the production freeze wall has been established. Freeze drilling for Lower Zone 1 is scheduled to begin in the 2nd quarter of 2009.

At Zone 2 (Panel 5), the brine system to form the new freeze wall was activated in the fourth quarter of 2008 and formation of the new freeze wall is in progress. The new freeze wall is expected to be in place in the second quarter of 2009. Approximately six months of freeze time is required before the raisebore chamber can be developed. By mid-2009, the ground should be sufficiently frozen to begin developing the raisebore chamber. Production is scheduled for Zone 2 (panel 5) in the second half of 2009. Cameco intends to produce over 85 million pounds of U_3O_8 from this area.

Development work for Lower Zone 4 is progressing. This area is classified as higher risk development for the raisebore chamber on the upper level and Cameco has adjusted its development and production schedules to recognize and mitigate these risks. In 2009, development of this Zone will continue and freeze hole drilling is expected to take place. Production from this area is now scheduled for 2010.

During the fourth quarter of 2008, access was successfully re-established along the previously backfilled Zone 2 Panel 3 freeze wall on the 530 level. This mining area will be used to extend the life of Panel 3 and is part of the revised production plan for 2009 to address the rescheduling of production from Lower Zone 4.

In November of 2008, the lower extraction area for Lower Zone 4 development on the 590 m level encountered a small inflow of water that was quickly captured and controlled. This area was considered low risk development which is defined as having an inflow potential of less than 100 m^3/h or an order of magnitude below the available pump and treat capacity. The inflow has not caused Cameco to alter any planned mining in this area. However, full grouting of the inflow area is required before development resumes. As of January 2009, the critical path for production in this area is on the 530 m level where freeze drilling will be carried out and not the 580/590 m level extraction area where the inflow was encountered. Other development on the 580 level continues.

1.9 Processing

McArthur River ore is processed at two locations. Size reduction is conducted underground at McArthur River and the resulting finely ground ore is pumped to surface and transported in truck mounted containers to Key Lake as a 50% solids slurry at a typical grade range of 15% to 30% U_3O_8. Blending down with mineralized waste to a nominal 4% U_3O_8 mill feed grade and all remaining uranium processing, tailings disposal and effluent treatment steps occur at Key Lake. The final uranium product is a calcined yellowcake grading 98% U_3O_8 on average.

The current CNSC licensed production rate for the combined McArthur River/Key Lake operations is limited to a maximum of 7.2 million kilograms U (approximately 18.7 million pounds U_3O_8) per year. Cameco has applied for an increased licensed capacity of 22 million pounds U_3O_8 annually. Options to further increase the production rate to 24 million pounds U_3O_8 annually are currently being assessed as part of a program to revitalize and expand the Key Lake operation.

The Key Lake mill is owned by the Key Lake Joint Venture (KLJV) and operated by Cameco. The KLJV is comprised of Cameco (66 2/3%) and UEM (33 1/3%). UEM is a company owned equally by Cameco and AREVA. The KLJV has entered into a toll milling agreement with AREVA for the processing of AREVA s share of McArthur River uranium at the Key Lake mill. Cameco and UEM, the other owners of the McArthur River Joint Venture (MRJV), have agreed that milling of each party s share of McArthur River ore will be accomplished through the KLJV and it is not necessary to enter into a formal toll milling agreement with the KLJV.

1.10 Environmental Assessment and Licensing

The McArthur River operation 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. The main regulatory agencies that issue permits / approvals and inspect the McArthur River mine are: the CNSC (federal), Fisheries and Oceans Canada (federal), Environment Canada (federal), Transport Canada (federal), Ministry of Advanced Education, Employment and Labour (provincial), and Ministry of Environment (provincial) (SMOE).

Three permits must be maintained to operate the mine. Cameco holds a Uranium Mine Facility Operating Licence from the CNSC, and an Approval to Operate Pollutant Control Facilities and a Permit to Operate Waterworks both from the SMOE. These permits are current. The CNSC operating licence was renewed for 5 year term in 2008 and expires on October 31, 2013. The SMOE approvals will require renewal in 2009 as they expire on October 31, 2009. The renewal process for these approvals has been started.

The Key Lake operation is regulated in a similar manner as the McArthur River mine and as such has regulatory obligations to both the federal and provincial governments. Three permits must be maintained to operate the Key Lake uranium mill. Cameco holds a Uranium Mill Operating Licence from the CNSC and an Approval to Operate Pollutant Control Facilities and Permit to Operate Waterworks both from SMOE. These permits are current. The CNSC operating licence was renewed for a five year term in 2008 and expires on October 31, 2013. The SMOE approvals will require renewal in 2009 as they expire on November 30, 2009. The renewal process for these approvals has been started.

The CNSC operating licences for McArthur River and Key Lake limit production to approximately 18.7 million pounds of U_3O_8 per year, while the provincial approval to operate pollution control facilities sets restrictions on the rates and quality of treated effluent that can be released to the environment. This provincial approval also specifies restrictions associated with the management and transport of mineralized wastes generated from the mining activities.

In 2002, Cameco applied to increase the annual licence capacity at both the McArthur River mine and the Key Lake mill to 22 million pounds U_3O_8 per year (compared to the current 18.7 million pounds). This application has been undergoing a screening level environmental assessment (EA) under the *Canadian Environmental Assessment Act*

(CEAA) with the CNSC as the responsible authority. The EA has been delayed due to discussions with the CNSC regarding how to address the local accumulation of molybdenum and trace amounts of selenium in the Key Lake downstream environment.

Cameco has developed an action plan to modify the effluent treatment process to reduce concentrations of molybdenum and selenium discharged to the environment. The CNSC facility operating licence includes a condition for the Key Lake mill to implement this action plan.

Pursuant to this action plan Cameco has been proceeding to modify the mill effluent treatment process in order to reduce molybdenum and selenium levels to very low concentrations. The project, originally planned to be complete in the first part of 2008, experienced difficulties in commissioning that have subsequently required further project changes. Cameco now expects this project to be completed and the new process changes optimized in the first half of 2009. Cameco plans to update the CNSC in April 2009 with respect to the indicative performance of the molybdenum and selenium removal circuit. Depending on the relative success of this project in reducing molybdenum and selenium concentrations in the Key Lake mill effluent, further work identified in the action plan referred to in the licence condition may or may not be required.

The EA for the increased licence capacity is pending demonstration of the effectiveness of the process to reduce concentrations of molybdenum and selenium. Cameco expects that reducing the current level of these metals will help advance this EA.

In addition to obtaining approval for the EA (which has to be resubmitted at the appropriate time) and licence approval to operate at higher production levels, Cameco needs to transition to new mining zones at McArthur River and to implement various mill process modifications at Key Lake in order to sustain increased production levels. Mine planning, development and freeze hole drilling for the McArthur River zone transition is ongoing and only after this transition is complete, can Cameco fully assess the production rate capacity of the new mining zones.

A revitalization assessment of the Key Lake mill was completed in the first part of 2008. Subsequently, engineering commenced and further assessment of alternative options began. The Key Lake revitalization plan includes upgrading circuits with new technology for simplified operation, increased production capacity and improved environmental performance. The engineering and project planning for replacement of the acid and oxygen plants was further advanced in 2008. Construction of these replacement plants is planned to start in 2009, subject to regulatory approvals.

If Cameco receives approval for the increased production limit, Cameco expects that annual production will range between current levels and 20 million pounds until such time as revitalization is completed at Key Lake. Annual production levels after mill revitalization are expected to be largely dependent on mine production. As such, Cameco anticipates it will be a number of years before it can achieve the sustainable increased production rates at these operations.

The tailings management facility (TMF) is located within the Deilmann pit, which was mined out in the 1990s. Tailings from processing McArthur River ore is deposited in this TMF.

In February of 2009, Cameco received regulatory approval for the deposition of tailings to a moderately higher elevation in the Deilmann TMF. At current production rates, the approved capacity of the Deilmann TMF increases from five years to approximately eight years, assuming only minor storage capacity losses due to sloughing (or erosion) from the pit walls.

Cameco also initiated technical pre-feasibility work to secure long-term tailings capacity at Key Lake that will be sufficient to hold all tailings generated from processing of McArthur River Mineral Reserves as well as substantial additional capacity to allow for other potential sources of production. This tailings option study is considering the feasibility of further extending the capacity of the Deilmann TMF and options for new tailings management facilities. Cameco expects to submit a project description to regulatory agencies in 2009 that will initiate the environmental assessment process for securing long-term tailings capacity at Key Lake.

With respect to the ongoing operation of the Deilmann TMF, Cameco has performed several studies to better understand the pitwall sloughing mechanism and initiated engineering work to design and build mitigation measures for prevention of sloughing. Sloughing has occurred in the past at the Deilmann TMF resulting in the loss of approved capacity. Although the situation has recently stabilized as a result of stabilizing the water level in the pit, there is a risk of further sloughing at the Deilmann TMF.

At the Key Lake site there is another TMF. It is an above-ground impoundment with tailings stored within compacted till embankments. This facility, constructed in 1983, has not received tailings since 1996. Cameco is reviewing several decommissioning options regarding this facility.

There are five rock stockpiles at the Key Lake site. Three of the stockpiles contain non-mineralized waste rock and two contain low-grade mineralized material. The latter are currently used to lower the grade of McArthur River ore to approximately 4% U_3O_8 before entering the milling circuit. The dilution of the high-grade ore serves three purposes: recovery of uranium from the low-grade material, reduction of radiation exposures in the mill, and final disposal of the low- grade waste. The remaining non-mineralized waste rock stockpiles will require decommissioning upon site closure.

1.11 Production Plan

The mining plan has been designed to extract all of the current Mineral Reserves. McArthur River currently has sufficient Mineral Reserves to continue production to 2033. Yearly production is currently limited by McArthur s Uranium operating license at 18.7 million pounds of U_3O_8.

It is expected that Mineral Reserves may increase as further exploration continues from both surface and underground and mining plans are put in place for Zones 4 South, A and B Mineral Resources. Cameco believes there is good potential it will be able to convert portions of the McArthur River Measured and Indicated Mineral Resources to Mineral Reserves, in order to maintain annual production at 18.7 million pounds for longer than currently estimated and/or extend mine life. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

1.12 Economic Analysis

The economic analysis for the McArthur River Mine, is based on the current mine plan and the estimated Mineral Reserves only. The analysis does not contain any estimating involving the potential mining and milling of the Mineral Resources from any mineralized zone. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category. Accordingly, expenditures that may be required to bring any of the Mineral Resources into production or to identify additional Mineral Resources have not been included.

The analysis is from the point of view of Cameco, which owns, directly or indirectly, 69.805% of the MRJV, and incorporates Cameco s projected sale revenue from its proportionate share of the related production, less its share of the related operating and capital costs of the MRJV, as well as all royalties that will be payable on the sale of concentrates.

The analysis estimated a pre-tax NPV (10%) to Cameco, as at January 1, 2009, of Cdn$2.69 billion for its share of the McArthur River Mineral Reserves. The pre-tax IRR has been estimated to be 13%.

Operating costs for the MRJV were estimated to average Cdn$19.69/lb U_3O_8 over the life of the estimated Mineral Reserves only. For the period from 2009 to 2013, operating costs were estimated to average Cdn$15/lb U_3O_8. The operating projections are stated in constant 2009 dollars and assume an annual production rate of 18.7 million pounds until 2016, and gradually declining annual production until 2033. Operating costs include estimated underground mining operations and milling costs.

Mining of the McArthur deposit is capital intensive in comparison to other underground types of mining. The extraction method utilizing raisebores allows the operation to minimize the size of excavations in ore and therefore reduce the risk of ground movement that could potentially impact the freeze wall integrity. Given the importance of preserving freeze wall integrity, the mining methods in this report has taken this into account.

1.13 Project Risks

McArthur River is a challenging deposit to mine. These challenges include control of ground water, weak ground formations, radiation protection, water inflow, mining method uncertainty and changes to productivity, mine transitioning, regulatory approvals, tailings capacity, reliability of facilities at Key Lake, surface and underground fires.

Two of the primary geotechnical challenges in mining the deposit are control of groundwater and ground support in the immediate area of massive mineralization, in areas where the rock is fractured and faulted, and in the overlying sandstone. In general, the poorest ground conditions have been encountered in the hanging wall sandstone along the western edge of the deposit, up from the footwall unconformity to the tip of the basement wedge. Geotechnical investigation holes are drilled into any planned mining areas prior to mining and help determine the mining design and whether development in an area is low, medium or high risk.

Major water bearing formations at high hydrostatic pressure are present in the altered sandstone, P2 fault and unconformity overlying the basement rocks. A risk of mine flooding is present if either of these formations is intersected with mine openings or exploration drill holes. As a result, prior to mining an ore zone, the footwall areas must be frozen to isolate the ore zone from the water bearing sandstone and vertical faults that form the western part of the deposit. Ground freezing also helps stabilize the highly fractured footwall rocks during mining operations and reduces the potential for radiation exposure from radon dissolved in the ground water. Ground freezing, however, will only reduce, but not eliminate, these challenges. The different methods of ground freezing can result in freeze walls that are not 100% enclosed and therefore do not provide full protection from water inflows. There is a possibility of a water inflow event during the drilling of holes to freeze the ground as well as due to other causes. Therefore, the risk of water inflows at McArthur River remains.

All mine development to date has attempted to minimize the amount of water to be encountered. This was done through extensive grouting and careful placement of mine development away from known groundwater sources whenever possible, as well as ground freezing.

Production at the McArthur River mine was temporarily suspended on April 6, 2003, as increased water inflow from an area of collapsed rock in a new development area, located just above the 530 m level, began to flood portions of the mine. Remedial work to return the mine to safe operating condition was initiated during the second quarter of 2003 and was sufficiently advanced in July 2003 for mine production to resume. The excess water inflow was sealed off by July 2004. Permanent water treatment capacity was expanded to about 750 m^3/h.

During the water inflow incident, additional temporary capacity was put in place to treat the water flows. Construction was completed in 2005 to increase the permanent and contingency water treatment capacity to approximately 1,500 m^3/h. In 2008, Cameco increased pumping capacity at the McArthur River mine to 1,650 m^3/h from the previous 1,500 m^3/h, with a potential to add additional capacity. Cameco has the ability to treat between 750 and 800 m^3/h through its conventional water treatment plant. In addition, another 750 m^3/h contingency water treatment capacity is available which requires regulatory approval to use. Beyond that, Cameco has water storage capability of 50,000 m^3 in a surface pond which could provide several weeks storage for any inflows in excess of hourly treatment capacity.

Current discharge rates are limited by the Saskatchewan MOE with the approval to release up to 360 m^3/h during the period of April 15 to June 15 to allow passage of spawning fish through the downstream Read Creek culvert and up to 833 m^3/h for the remainder of the year. Cameco is working on obtaining regulatory clarity for contingency water treatment and release in the event of a large water inflow.

In 2009, McArthur River plans to upgrade the Read Creek culvert to allow fish passage during high flow conditions, apply to Saskatchewan MOE for removal of the 360 m^3/h flow restriction, and submit an application to CNSC and Saskatchewan MOE for formal approval of the McArthur Contingency Water Management Plan that would allow Cameco to operate the contingency water treatment plant and discharge at rates up to 1500 m^3/h during mine inflow conditions.toto

In November of 2008, the lower extraction area for Lower Zone 4 development on the 590 m level encountered a small inflow of water that was quickly captured and controlled. This area was considered low risk development which is defined as having an inflow potential of less than 100 m^3/h or an order of magnitude below our pump and treat capacity. The inflow has not caused Cameco to alter any planned mining in this area. However, full grouting of the inflow area is required before development resumes.

The 2008 water inflow is still under investigation, however the necessary measures to control the water have been implemented and progress is being made. The water is being managed through the conventional water handling systems, and contingency water treatment systems have not been required to mitigate this situation.

The consequence of another water inflow at McArthur River will depend upon the magnitude, location and timing of any such event, but could include a significant reduction in McArthur River 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. Although Cameco takes steps to mitigate the risks of water inflow, there can be no guarantee that such steps will be successful and water inflow could have a material impact upon Cameco.

A significant amount of the estimated Mineral Reserves in Upper Zones 1, 3, and 4 have been planned for mining with the boxhole boring method, with production planned to commence in Upper Zone 4 in 2013. This method has had limited testing at Cigar Lake and Rabbit Lake. Boxhole boring is a mining technique used around the world, this will represent its first application in uranium mining. Additional testing at McArthur River will be required to evaluate the productivity of this method, and will likely require additional operational development during test work and initial mining phases.

In order to address the technical challenges with this mining method (described above), Cameco has scheduled a long lead-time for implementation to ensure the technical challenges are understood and risks mitigated. Until Cameco has fully developed and tested the boxhole boring method at McArthur River, there is uncertainty in the estimated productivity. Failure to resolve the technical challenges with this mining method could adversely impact planned production and timing, which could have a material impact upon Cameco.

Beginning in 2009, Cameco expects to transition to new mining areas at McArthur River, which involves significant technical challenges. Failure or delay in overcoming these challenges may have a material impact upon Cameco.

Underground mine fires pose a serious threat to mine workers and mine operations. Controls and procedures are in place to mitigate the risk of mine fires.

Failure to maintain existing tailings capacity at the Deilmann TMF due to sloughing or other causes or failure to obtain or delay in obtaining regulatory approval for a new tailings management facility or to expand existing tailings capacity at the Deilmann TMF could constrain uranium production, which could have a material adverse impact upon Cameco.

The original Key Lake milling facilities and related infrastructure have been in service for over twenty five years. In late 2006 to address the risks associated with an aging facility, Cameco initiated the development of a strategic plan to revitalize the Key Lake facilities for the next 25 years of operation to mill McArthur River ore. The key objectives of this plan are to refurbish or replace selected areas of the existing infrastructure, enhance environmental performance and increase nominal production capacity to approximately 24 million pounds U_3O_8 per year. As part of the revitalization of the Key Lake mill, Cameco is planning to commence the construction of replacement of acid and oxygen plants in 2009.

1.14 Conclusions and Recommendations

With more than a 150 M lbs of U_3O_8 mined from the McArthur River deposit, Cameco has demonstrated that the challenging conditions associated with mining in the Athabasca Basin can be overcome. The operational experience gained since the start of commercial production has resulted in significant risk reduction.

The McArthur River operation estimated Mineral Reserves have proven, thus far, to be conservative with more U_3O_8 extracted than predicted to date. As a result of the high grade of the deposit it has been shown that the Mineral Reserve based economics produce robust cash flow margins and are not significantly sensitive to the grade and price variations assumed in this report. Given that the Zone 4 area, planned for production in 2010, has no historic production base for comparison with the Mineral Reserve estimates, calibration may be required.

The single greatest risk to the operation is production interruption from water inflows. Although significant improvements have been made since 2003, mining has inherent risk as rockmass quality is variable in nature. The operation has developed maximum inflow volume scenarios that have been validated by independent consultants and pumping and treatment systems have been established accordingly. However, it is recommended that ongoing assessment and redundant capacity requirements continue to be reviewed.

Cameco has recognized the need to develop new mining methods such as boxhole boring for ore extraction in the upper portion of the mineralized zones of the McArthur River deposit where raisebore chambers are difficult to develop. This approach is fully endorsed, but productivity from the boxhole method is not yet firmly established. The test program for boxhole boring therefore needs to continue as planned.

The Mineral Resources at the operation are significant and it is recommended that Cameco assess the potential for converting Mineral Resources to Mineral Reserves in the south end of the mine initially. This is necessary for the mine to increase either the time frame for mining at 18.7 million lbs of U_3O_8 per year or extending the mine life. In light of the positive surface drilling results encountered over the last several years, it is recommended that surface exploration be continued along the north and south ends of the P2 structure.

In order to improve confidence on the calculation of uranium grade from radiometric probing results it is recommended that one in twenty underground holes should be assayed to confirm that the current calibration of the probe is reliable. Further density determination should be made on core samples prior to sampling the core. This is for confirmation of the formula currently used to calculate density.

With the recent and planned expenditures on infrastructure at Key Lake, mill capacity is expected to return to past performance levels, and in the future have capacity to produce beyond the current license limit. Longer term issues with tailings are well understood and studies for tailings capacity expansion take into account the Mineral Reserves and Resources at McArthur River as well as other potential tailings streams.

The high grade nature of the deposit has required a capital intensive approach to extraction. As such, the operating and capital budgets set out in Tables 18-7, 18-8 and 18-9 of Section 18.7 are necessary to ensure that the McArthur River operations continue to produce in the lowest risk environment possible and are endorsed by the authors of this technical report. Given the significant margin of cost to revenue, it is believed that all estimated Mineral Reserves can be extracted economically. It is recommended that any increased production be in the context of increased raisebore access along the strike length of the estimated Mineral Reserve and potential Mineral Resource additions.

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 report prepared for Cameco, by or under the supervision of internal qualified persons and one external qualified person, is in support of disclosure of material scientific and technical information on the McArthur River operation. The report has an effective date of December 31, 2008 and has been prepared to comply with NI 43-101 under the supervision of the following individuals:

David Bronkhorst, P. Eng., General Manager, McArthur River Operation, Cameco Corporation;

Charles R. Edwards, P. Eng., Director Metallurgy, AMEC Americas Ltd.

Alain G. Mainville, P. Geo, Director, Mineral Resources Management, Cameco Corporation;

Gregory M. Murdock, P.Eng., Technical Superintendent, McArthur River Operation, Cameco Corporation

Leslie D. Yesnik, P. Eng., General Manager, Key Lake Operation, Cameco Corporation

The individuals noted above are qualified persons within the meaning of NI 43-101 responsible for the content of this report. All five qualified persons have visited the McArthur River and Key Lake sites. The date and duration of each qualified person s most recent inspection of the McArthur River and Key Lake sites are included in their respective Certificate of Qualified Person filed with this report and are listed below.

Charles R. Edwards visited the McArthur River Operation for a day in April 2008 to review the ore slurry handling processes, equipment and structures and tour the plant. Mr. Edwards went to the Key Lake Operation in May 2008 for a day to review the milling processes, equipment, technology development and revitalization plans and to tour the plant. Mr. Edwards previously made numerous visits to both sites while Director, Engineering & Projects with Cameco.

Alain G. Mainville toured the Key Lake mill and the McArthur River underground mine on February 22, 2008. Mr. Mainville was previously an employee at Key Lake for seven years. He has been involved with the McArthur River Operations since 1995 and has visited the site on numerous occasions.

Mr. Bronkhorst and Mr. Murdock s work locations are at the McArthur River Operation and have therefore visited the site generally at least twice a month for periods extending up to seven days.

Mr. Yesnik is General Manager of Key Lake Operation and is present at the site generally at least twice a month for periods extending up to 7 days.

2.2 Report Basis

This report has been prepared with available internal Cameco data and information and data and information prepared for the MRJV.

The principal technical documents and files relating to the McArthur River operation that were used in preparation of this report are listed in Section 22.

3 RELIANCE ON OTHER EXPERTS

In the context of Form 43-101F1, item 5, the authors have relied, and believe they have a reasonable basis to rely, upon the following individuals who have contributed the environmental, legal, social, marketing and taxation information stated in this report, as noted below:

Jean Alonso, P. Eng, Director, Compliance & Licensing, Cameco Corporation, Sections 4.6 (a description of known environmental liabilities) and 18.5 (a description of environmental considerations)

Pat Landine, P. Eng, Chief Geo-Environmental Engineer, Technical Services, Cameco Corporation, Sections 4.6 (a description of known environmental liabilities) and 18.5.3 (a description of environmental considerations).

Larry Korchinski, LLB, Director, Legal Affairs, Securities Compliance, Cameco Corporation, Sections 4.2 (a description of mineral tenure), 4.3 (Surface tenure), 6.1 (a description of ownership), and 18.4.3 (a description of toll milling contracts), and 19.9 (aboriginal title and consultation issues).

Penny Buye, BA Econ, Manager, Market planning and Analysis, Marketing, Cameco Corporation, Section 18.3 (a description of uranium markets) and 18.4.4 (a description of uranium sales contracts).

Bev Godson, CMA, Director, Financial Services, Cameco Corporation, Section 18.6 (a description of taxes and royalties).

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The McArthur River minesite is located near Toby Lake in northern Saskatchewan, approximately 620 km north of Saskatoon, at approximate latitude 57º 46 north and longitude 105º03 west, and about 40 km inside the eastern margin of the Athabasca Basin Region in northern Saskatchewan, Canada (see Figure 1).

The McArthur River minesite is 80 km northeast by road from the Key Lake milling operation. The Cigar Lake project is 46 km northeast and the Rabbit Lake operation is 95 km northeast from the McArthur River minesite. No direct roads connect McArthur River to the Cigar Lake or Rabbit Lake operations.

Figure 1 McArthur River Operation Location

Source: Cameco

4.2 Mineral Tenure

The mineral property consists of 21 mineral claims and one mineral lease (ML-5516) totalling 84,818 ha.

The McArthur River uranium deposit is located in the area subject to ML-5516, totalling 1,380 ha. The right to mine this uranium deposit was acquired by Cameco under this mineral lease, as renewed, effective March 8, 1994 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 *The Crown Minerals Act* (Saskatchewan), the term of ML-5516 is for 10 years, with a right to renew for successive 10 year terms absent a default by Cameco. Lease ML-5516, like all Crown leases, cannot be terminated by the provincial government except in the event of default or default under any of the provisions of *The Crown Minerals Act* (Saskatchewan), or regulations there under, including for certain prescribed environmental concerns. The current mineral lease expires in March 2014.

Surrounding the McArthur River uranium deposit are 21 mineral claims, totalling 83,438 hectares. The 21 mineral claims were also granted by the province of Saskatchewan under *The Crown Minerals Act* (Saskatchewan). These mineral claims grant the right to explore for minerals. 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. The mineral lease and claims are delineated on the ground by staking posts. The *Mineral Disposition Regulations, 1986*, (Saskatchewan) recognize the staked boundaries as the legal boundaries. A legal survey of a portion of the western property line was done in 1984 and covers the boundary adjacent to the McArthur River mine site.

An annual cash payment of $13,800 is required to maintain ML-5516 in good standing. The 21 mineral claims require annual exploration expenditures of $2.1 million. However, title is secured until at least 2017, by virtue of previous assessment work submitted and approved by the province of Saskatchewan. Disposition status is included in **Table 4-1**.

Figure 2 shows the McArthur River mineral lease and mineral claims as currently registered with the province of Saskatchewan.

Table 4-1 McArthur River Operation Disposition Status

Disposition	Record Date	Area (ha)	Annual Assessment	Next Payment Due
ML 5516	8-Mar-84	1,380	$13,800	08-Mar-09
S 105653	8-Mar-77	4,880	$122,000	08-Mar-17
S 105654	8-Mar-77	4,076	$101,900	08-Mar-17
S 105655	8-Mar-77	4,380	$109,500	08-Mar-17
S 105656	8-Mar-77	3,434	$85,850	08-Mar-17
S 105657	8-Mar-77	3,290	$82,250	08-Mar-17
S 105658	8-Mar-77	4,060	$101,500	08-Mar-17
S 105659	8-Mar-77	4,752	$118,800	08-Mar-17
S 105660	8-Mar-77	2,945	$73,625	08-Mar-17
S 105661	8-Mar-77	4,505	$112,625	08-Mar-17
S 105662	8-Mar-77	3,470	$86,750	08-Mar-17
S 105663	8-Mar-77	3,248	$81,200	08-Mar-18
S 105664	8-Mar-77	5,055	$126,375	08-Mar-19
S 105665	8-Mar-77	4,519	$112,975	08-Mar-18
S 105666	8-Mar-77	4,930	$123,250	08-Mar-17
S 105667	8-Mar-77	3,926	$98,150	08-Mar-17
S 105668	8-Mar-77	2,075	$51,875	08-Mar-17
S 105669	8-Mar-77	2,838	$70,950	08-Mar-17
S 105670	8-Mar-77	5,207	$130,175	08-Mar-17
S 105671	8-Mar-77	3,586	$89,650	08-Mar-18
S 105672	8-Mar-77	3,390	$84,750	08-Mar-17
S 105673	8-Mar-77	4,872	$121,800	08-Mar-18
Total Claims (21)		**83,438**	**$2,085,950**	
Total Lease (1) and Claims (21)		**84,818**	**$2,099,750**	

Figure 2 Mineral Lease and Claims Map

4.3 Surface Tenure

The surface facilities and mine shafts for the McArthur River operation 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 of Saskatchewan. The most recent surface lease agreement was signed in April 1999 and has a term of 33 years. The province of Saskatchewan uses surface leases as a mechanism to achieve certain environmental protection and socio-economic objectives. As a result, certain obligations are attached to the surface lease and relate primarily to annual reporting regarding the status of the environment, land development, and progress on northern employment and business development. On termination or expiry of the surface lease, a new surface lease can be entered into, if necessary, until full property decommissioning and reclamation has been achieved. The McArthur River surface lease presently covers approximately 651 ha.

The McArthur River operation is located on historical traditional lands of First Nations. Pursuant to historical treaties, it is generally acknowledged that First Nation bands ceded Aboriginal Title to most traditional lands in northern Saskatchewan in exchange for treaty benefits and reserve lands but generally retained their right to hunt, fish, and trap on these traditional lands. Cameco understands that the federal and Saskatchewan governments have a duty to consult First Nations before taking actions that affect the ability of First Nations to exercise treaty rights. A more detailed discussion of the governments duty to consult, its impact on project proponents generally, and Cameco s notice of claims potentially affecting the Key Lake and McArthur River sites is provided in section 19.9 below.

The McArthur River mine site is compact, occupying approximately an area of one kilometre in the north/south direction and half a kilometre in the east/west direction. Figure 3 shows the McArthur River general site arrangement with the outline of the surface leases.

In 2007, the annual rent and taxes for the McArthur River surface lease were $1 million and for quarries and miscellaneous, $19,000.

Tri-City Surveys of Saskatoon, Saskatchewan, carried out the McArthur River surface lease survey in March 2000.

Figure 3 Map of Mine Facilities and Surface Lease

4.4 Mine and Infrastructure

All current Mineral Reserves and Mineral Resources are contained within mineral lease ML-5516. Underground workings are confined to a small area of the mineral lease where mining is concentrated.

Waste rock piles from the excavation of the three shafts and all underground development are confined to a small footprint within the surface lease. Waste rock management is further discussed in Section 5.5 and Section 18.5.3.

No tailings are stored at the McArthur River site since all ore mined is transported to the Key Lake mill for processing. Tailings management at the Key Lake site is discussed in Section 18.5.3.

A discussion of the mine shafts, buildings, and infrastructure at the McArthur River site is included in Section 5.5.

A site plan of the existing and planned surface facilities is shown in Figure 3. . The locations of the McArthur River deposit and other significant but sub-economic uranium discoveries are further discussed in section 6.2.1 and presented on Figure 6-1.

4.5 Royalties

For a discussion of royalties, see Section 18.6.2.

4.6 Known Environmental Liabilities

Material environmental liabilities are essentially future decommissioning liabilities. These are covered by regulatory-required financial assurances. In this process, Cameco develops a conceptual plan describing how a particular site could be decommissioned. Once the plan is accepted by the regulatory agencies, it is then cost estimated, typically resulting in the issuance of letters of credit. The design basis for this work is a decommission tomorrow scenario, as the regulatory foundation of this work is protection of the taxpayer in the event that a company is unable to meet its decommissioning obligations. It is important to note that regulators accept the decommissioning plans in concept as an approach to address environmental liabilities which has reasonable prospects of meeting current regulatory requirements. As Cameco-operated properties approach or go into decommissioning, further regulatory review of the detailed decommissioning plans may result in additional requirements, associated costs and financial assurances. It is not possible to predict what level of decommissioning and reclamation (and financial assurances relating thereto) may be required in the future by regulators. If Cameco is required to comply with significant additional regulations or if the actual cost of future decommissioning and reclamation is significantly higher than current estimates, this could have a material adverse impact on the work needed to address these future environmental liabilities.

Beginning in 1996, Cameco has conducted regulatory-required reviews of its decommissioning plans for all Canadian sites. These periodic reviews are nominally done on a five-year basis, or at the time of an amendment to or renewal of an operating licence. These updates serve to reflect changes in operations, conditions, evolving technologies and changing regulatory requirements. In 2003, Preliminary Decommissioning Plans (PDPs) for both the Key Lake (Cameco, 2003a) and McArthur River operations (Cameco, 2003b) were prepared by Cameco and approved of by both the CNSC and SMOE. These conceptual PDPs discussed the environmental liabilities that were known at that time. The estimated cost of implementing these PDPs and addressing the known environmental liabilities resulted in production of two other associated documents called preliminary decommissioning cost estimates (PDCEs) for both Key Lake (Cameco 2003c) and McArthur River Operations (Cameco, 2003d). Financial assurances to cover the 2003 PDCEs for McArthur River and for Key Lake operations were posted with SMOE in the form of irrevocable standby letters of Credit (LOC).

These documents were revised in 2008 in support of the CNSC licence renewal process, and considered changes to conditions over the preceding 5 year period since the last revision. Based on the total estimated decommissioning costs presented and approved in these PDCEs, Cameco increased the financial assurance posted with the province of Saskatchewan to Cdn$120.7M and Cdn$36.1M for decommissioning the Key Lake and McArthur River operations, respectively. These estimates replace the 2003 estimates of Cdn$45.5M and Cdn$8.6M respectively. These financial assurances represent 100% of the total estimated costs and not Cameco s share of such costs. Broadly speaking, the increases in the estimates have resulted from significant escalation of labour and equipment rates, increases in up-front project management efforts, interim care and maintenance costs while awaiting regulatory approvals, higher levels of contingency in engineering cost estimates, and general inflation provisions. A measure of stability in the estimates for the next few years is expected, given the granting of five-year licences to 2013.

The known environmental liabilities are discussed further in Section 18.5.

4.7 Permitting

For a discussion of permitting, see Section 18.5.1.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

McArthur River ore is transported to the Key Lake mill for processing some 80 km to the southwest along a gravel road.

The property is accessible by road and air. Supplies are transported by truck and can be shipped from anywhere in North America through the company transit warehouse in Saskatoon. Trucks travel north from Saskatoon, on a paved provincial road through Prince Albert to just south of La Ronge, then west on gravel surfaced Provincial Road 165 and north on gravel Provincial Road 914 to the Key Lake mill. The 80 km road from Key Lake to McArthur River is gravel surfaced and maintained by Cameco. The Key Lake to McArthur River road is used to transport ore to Key Lake for processing and to ship supplies to McArthur River. Public access to this road is controlled and restricted. Figure 4 shows the regional location of the McArthur River site and local roads.

An unpaved airstrip is located approximately one kilometre east of the minesite within the surface lease, allowing flights to and from the McArthur River property.

Figure 4 McArthur River 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 30^0 C on occasion. Mean daily maximum temperatures of the warmest months are around 20^0 C and only three months on average have mean daily temperature of 10^0 C or more. The winters are cold and dry with mean daily temperature for the coldest month below minus 20^0 C. Winter daily temperatures can reach below minus 40^0 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 throughout the year despite cold winter conditions. The fresh air necessary to ventilate the underground workings is heated during the winter months using propane-fired burners.

5.3 Physiography

The McArthur River project lies within the Athabasca South Eco-District of the Northern Boreal Eco-Region. The vegetation at the McArthur River property are typical of the taiga forested land common to the Athabasca basin area of northern Saskatchewan. The topography in the region is dominated by large scale drumlins, which locally can have relief of 100 m above the surrounding lakes. Overburden thickness over the deposit is approximately 10 m. The terrain consists primarily of sandy rolling hills which are separated by a number of low-lying areas filled with lakes, creeks, and muskegs.

The dominant upland forest type is a semi-open jack pine forest with an understory of lichens and blueberries. The moister lowlands are predominated by open black spruce and tamarack stands with an understory of mosses and Labrador tea. Major forest fires have covered most of the McArthur River area over the last 20 years and have modified the local vegetation.

The minesite elevation is approximately 550 masl.

5.4 Local Resources and Proximity to Population Centre

No communities are located in the immediate vicinity of either the McArthur River or Key Lake operations. The closest community to the two operations is the village of Pinehouse, 240 km south of the Key Lake site by gravel Provincial Road 214. The McArthur River minesite is a further 80 km north from the Key Lake site via a Cameco maintained gravel road.

Employees commute from a number of designated communities by air. Most company employees are on a week-in and week-off schedule. Contractor employees are generally on a longer work schedule.

Athabasca Basin community residents fly from various pick-up points in smaller airplanes to the minesite. Southern resident employees fly to the 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.

Personnel are recruited on a preferential basis: initially from the communities of northern Saskatchewan, followed by the province of Saskatchewan generally, and then from outside the province. Personnel are flown to site from the northern area communities and major Saskatchewan population centres such as Saskatoon.

Site activities such as construction work and mine development work are performed by northern owned or joint venture contactors and major contractors that have the ability to hire qualified personnel from the major mining regions across Saskatchewan and Canada. Cameco personnel conduct all production functions.

The McArthur River 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 620 km south of the McArthur River mine with highway and air links to the rest of North America.

5.5 Infrastructure

McArthur River is a developed producing property, with sufficient surface rights to meet all of its mining operation needs as well as sufficient site facilities and infrastructure. Site facilities include a 1600 m long gravel airstrip and air terminal, permanent residence and recreation complex, administration and maintenance shops building, warehouse, water treatment plant and ponds, freeze plant, concrete batch plant, Pollock, No. 2, and No. 3 Shaft headframes and hoisthouses, site roads, powerhouse, electrical substations, ore loadout building, fresh water pumphouse and miscellaneous infrastructure.

Power to the McArthur River site is provided by a SaskPower 10 km long 138 kV feeder line from the main power transmission line. There are standby generators in case of grid power interruption.

The McArthur River mine site has access to sufficient water from nearby Toby Lake to satisfy all industrial and residential water requirements.

No tailings management facilities are required as McArthur River ore is sent to the Key Lake mill for processing. Processing facilities at Key Lake are discussed in Section 16.3. Tailings management facilities at Key Lake are discussed in Section 18.5.3.

Waste rock piles from the excavation of the three shafts and all underground development are confined to a small footprint within the surface lease. Waste piles have been segregated into three separate areas: clean waste, mineralized waste (>0.03% U_3O_8) and potentially acid generating waste (PAG). The latter two stockpiles are contained on engineered lined pads. The clean waste piles include piles for mine development waste, crushed waste, and various piles for concrete aggregate and backfill. Waste rock management is discussed in Section 18.5.3.

6 HISTORY

6.1 Ownership

There have been numerous changes in ownership of participating interests in the joint venture that governs the McArthur River property. The current owners, and their participating interests in the MRJV are as follows: Cameco has a direct and indirect participating interest of 69.805% and AREVA has a direct and indirect participating interest of 30.195%.

The original joint venture was established in 1976 between Canadian Kelvin Resources Ltd. and Asamera Oil Corporation Ltd. (Asamera) to explore the Keefe Lake area. Asamera was the operator of the joint venture. In 1977, SMDC, a predecessor company to Cameco, 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).

Effective January 1, 1980, a joint venture agreement was entered into to govern exploration of the McArthur River area and SMDC, holding a 50.75% participating interest in the joint venture at that time, was appointed the operator of the MRJV.

Between 1980 and 1988, SMDC was involved in a number of transactions of sales and purchases of participating interests in the MRJV.

In 1988, Eldorado Resources Limited merged with SMDC to form Cameco. In connection with that merger transaction, SMDC assigned to Cameco its 43.991% participating interest in the MRJV and Cameco became the operator of the MRJV.

In 1992, Cameco acquired an additional 10.0% participating interest in the MRJV and in 1995, Cameco entered into two transactions with Uranerz Exploration and Mining Limited (Uranerz) that resulted in Cameco holding, in total, a 55.844% participating interest in the MRJV.

Since 1995, there have been two significant changes in ownership in the MRJV:

in 1998, Cameco bought all of the shares of Uranerz (and changed Uranerz s name to UEM Inc.), thereby increasing its direct and indirect participating interest in the MRJV to 83.766%; and

in 1999, AREVA acquired one-half of the shares of UEM Inc., thereby reducing Cameco s direct and indirect participating interest in the MRJV to 69.805% and increasing AREVA s direct and indirect participating interest in the MRJV to 30.195%.

6.2 Exploration and Development History

6.2.1 General

Cameco, through its predecessor company, SMDC, became operator of the McArthur River project in 1980. Surface exploration programs, ranging from small line cutting crews to large helicopter supported drilling and prospecting camps, were active from 1980 through to 1992.

The McArthur River deposit was discovered by surface drilling in 1988. Additional surface diamond drilling from 1988 to 1992 further delineated the ore zone. Mineralization occurs at depths of 500 m to 640 m and is hosted in both the Athabasca sandstones and the underlying Aphebian metasedimentary gneisses. A graphitic, southeast dipping thrust fault is the source of a coincident electromagnetic conductor. The deposit does not have the extensive clay alteration halo or the cobalt-nickel-arsenide mineral association common to many other Saskatchewan uranium deposits.

In 1993, an underground exploration program, consisting of shaft sinking, lateral development, and diamond drilling was approved by government agencies. Approvals for mine construction and development were obtained in 1997. First production was achieved in December 1999.

Construction and development of the McArthur River mine was completed on schedule and mining commenced in December 1999. Commercial production was achieved on November 1, 2000.

The McArthur River deposit, originally called P2 North, is on the P2 grid situated on the north western boundary of the property (see Figure 5). Other significant, but sub-economic discoveries which are located on the property include the Harrigan Zone, the BJ Zone, and P2 Main. A brief history of exploration on the P2 grid is discussed below.

6.2.2 P2 Grid Exploration History

Routine prospecting in 1980 and 1981 discovered radioactive boulders about 10 km southwest of the McArthur River deposit. Although an on-property source for these boulders has never been proven, they did help to intensify exploration efforts in this portion of the property. Exploration on the P2 grid accelerated in 1984 following the detection of a basement conductor with reconnaissance geophysical surveying. Definition of the entire P2 conductor was completed in 1986. The open ended conductor extended for 12 km on the property and became a high priority exploration target.

In 1985, drilling on the P2 conductor resulted in the discovery of the P2 Main sandstone hosted mineralization, associated with a major fault zone. Additional drilling to 1988 defined a 500 m long, sub-economic zone of mineralization with the best intersection being 1.38% U_3O_8 over 7.3 m.

In the summer of 1988, drilling along the northern portion of the conductor encountered structural disruption and sandstone alteration in hole MAC-195. MAC-196 was collared about 100 m to the west and intersected weak sandstone hosted mineralization, with characteristics similar to P2 Main. The next hole, 100 m north, intersected a similar but wider zone of mineralization. The last hole of the year, MAC-198, encountered the unconformity much higher than expected, but 65 m deeper it passed back into sandstone and intersected a 10 m thick zone of high-grade mineralization along the faulted basement/sandstone contact. Subsequent surface drilling programs in 1989, 1990, 1991, and 1992 delineated the mineralized zone over a strike length of 1,700 m and occurring at depths ranging between 500 m and 640 m. Since 1993 over 630 underground drill holes, totalling in excess of 56,000 m, have since provided detailed information for 750 m of the strike length. Over 1,400 additional underground diamond drill holes, totalling 85,000 m, were drilled for geotechnical information; probe and grout covers; service and drain holes; and freeze holes. Four distinct mineralized zones, identified as Zones 1, 2, 3, and 4, have been defined to date. Two additional Zones, A and B, are on the northern portion of the deposit and are indicated by surface drill holes only.

Diamond drilling to evaluate the P2 trend north of the McArthur River mine has been ongoing since 2004. As at December 31, 2008, approximately 80 surface drill holes totalling in excess of 42,000 m, comprising a combination of conventional and directional drilling, have tested the P2 structure at approximately 200 m intervals for a distance of 4.3 km north of the mine.

The exploration program for 2008 was a continuation of the brownfield drilling program which commenced in 2004. The area of focus was along the P2 trend to the north of Zone B. 2008 marked the second year of a three year accelerated brownfield exploration program with the goal to evaluate the full potential of the entire P2 trend.

Figure 5 P2 Grid Map

6.3 Historical Mineral Resource and Mineral Reserve Estimates

The original McArthur River resource estimates were derived from surface diamond drilling. The drill hole data consists of assay results from 42 drill holes compiled with all relevant geological and technical data. The very high grade encountered in these drill holes justified the development of an underground exploration project. National Instrument 43-101 defines historical estimate as an estimate of mineral resources or mineral reserves prepared prior to February 1, 2001. Unless specified, reported estimates are for the McArthur River operation on a 100% basis and not solely for Cameco s share thereof.

6.3.1 Historical Estimates 1991 - 2000

McArthur River Mineral Resources and Mineral Reserves published in Cameco Annual Reports for year-ends 1991 to 2000 were estimated and disclosed prior to the adoption of NI 43-101 and should be considered as historical. Except for 2000 year-end, they were not classified in compliance with NI 43-101. Their classifications as geological reserves or mineable reserves do not conform to the current CIM Definitions Standards for Mineral Resources and Reserves since the categories used at the time are not acceptable today. In today s terminology, they would likely be equivalent to Mineral Resources or Mineral Reserves but still lacking proper resource and reserve sub-classification., These historical estimates are reported for historical purposes only. Except for the November 1995 historical resource model based on the pre-1992 surface drillholes, the historical estimates are not relevant or reliable as they have been superseded by a number of updated mineral resources and mineral reserves disclosures.

Geological reserves reported by Cameco for year-ends 1991 to 1994 are shown on **Table 6-1**. The estimates were based on 44 surface holes covering sections 7600N to 9300N. They were done using a cross-sectional method and a cut-off grade of 0.50% U_3O_8.

Table 6-1: Historical Resource Estimate Cameco, October 1991

Year-ends	Type	Tonnes (x 1000)	Grade % U_3O_8	Lbs U_3O_8 (millions)
1991-1994	Geological Reserves	2,370	5.0	260

Notes:

(1) See the cautionary statements for historical estimates in the first paragraph of Section 6.3.1.

(2) The necessary work to verify this historical estimate, its classifications and assumptions has not been completed. As such, this historical estimate should not be relied upon. It may not be equivalent to current classification definitions.

In November 1995, Cameco announced the results of an updated estimate of geological reserves and mineable reserves . They are based on 37 surface holes and 50 underground diamond drill holes intersections above a cut-off of 0.5% U_3O_8 on sections 7600N to 9300N. The 1995 historical estimates are listed on **Table 6-2**. In Cameco Annual Report for year-end 1995 geological reserves and mineable reserves were reported respectively as resources and reserves. The geological reserves were defined by a cross-sectional method on 21 vertical sections spaced at 50m and 100 m. The qualified person for this section, Alain G. Mainville, has verified the data, assumptions and methodology for the November 1995 estimate of geological reserves , and found the estimate not relevant but reliable as a basis to report remaining mineral inferred resources defined by the pre-1993 surface drilling. As additional underground and surface drilling was added over the years, the mineral resources for the areas not drilled since 1992 were reported from the November 1995 resource model. The underground drilling, from which the mineable reserves were defined, was contained within the area between mine grid Northing 8125N and 8450N.

Table 6-2: Historical Resource & Reserve Estimates Cameco, November 1995

Year-ends	Type	Tonnes (x 1000)	Grade % U_3O_8	Lbs U_3O_8 (millions)
1995-1997	Mineable Reserves	365.7	19.06	153.7
	Geological Reserves	859.0	12.02	227.8

Notes:

(1) See the cautionary statements for historical estimates in the first paragraph of Section 6.3.1.

(2) The necessary work to verify the historical mineable reserves estimate, its classifications and assumptions has not been completed. As such, the historical mineable reserves estimate should not be relied upon. It may not be equivalent to current classification definitions.

The historical reserves and resources published by Cameco at the end of 1998 and 1999 are presented on **Table 6-3**. They are the result of a 3-year program of underground drilling in the area between 8187N and 8307N defined as Zone 2.

Table 6-3: Historical Resource & Reserve Estimates Cameco, December 1998

Year-ends	Type	Tonnes (x 1000)	Grade % U_3O_8	Lbs U_3O_8 (millions)
1998-1999	Proven Reserves	505.0	22.15	246.5
	Probable Reserves	163.0	2.42	8.7
	Total Reserves	**668.0**	**17.33**	**255.2**
	Indicated Resources	859.0	12.02	227.8

Notes:

(1) See the cautionary statements for historical estimates in the first paragraph of Section 6.3.1.

(2) The necessary work to verify this historical reserves estimate, its classifications and assumptions has not been completed. As such, this historical reserves estimate should not be relied upon. It may not be equivalent to current classification definitions.

McArthur River Mineral Resources and Reserves, published in Cameco Annual Report for year-end 2000 and listed on Table 6-4 are historical estimates. The classification of mineral resources and reserves and the subcategories of each, conformed to the definitions prescribed in the proposed NI 43-101 dated November 17, 2000 and defined by the Canadian Institute of Mining, Metallurgy and Petroleum as the CIM Definition Standards on Mineral Resources and Mineral Reserves and adopted by CIM Council on August 20, 2000. The year-end 2000 Mineral Reserves and Resources estimates reflected additional drilling in Zones 1, 2, 3 and 4, along with a density adjustment based on mining production during 2000. They are not relevant and reliable as they have been superseded with a number of updated mineral resources and reserves disclosures.

Table 6-4: Historical Resource & Reserve Estimates Cameco, December 2000

Year-end	Type	Tonnes (x 1000)	Grade % U_3O_8	Lbs U_3O_8 (millions)
2000	Proven Reserves	768.0	21.00	355.5
	Probable Reserves	77.0	23.04	39.0
	Total Reserves	**845.0**	**21.18**	**394.5**
	Indicated Resources	614.0	10.74	145.4

Notes: (1) See the cautionary statements for historical estimates in the first paragraph of Section 6.3.1.

(2) The necessary work to verify this historical reserves estimate, its classifications and assumptions has not been completed. As such, this historical reserves estimate should not be relied upon. It may not be equivalent to current classification definitions.

6.4 Historical Production

The McArthur River operation received its first operating licence in October 1999 from the AECB who later became CNSC. The underground development completed in 1999 was sufficient to allow production mining to begin in the fourth quarter. Mine production was ramped up over the next two years to just under the operating license limit of 18.718 million pounds of U_3O_8 per year (see Table 6-5). During 2008 Cameco s share of the mine production was 12.2 million pounds U_3O_8 and portions of it remained stockpiled.

Table 6-5 McArthur River Historical U3O8 Mine Production

Year	Tonnes (x 1000)	Grade % U_3O_8	Lbs U_3O_8 (millions)	Cameco s Share Lbs U_3O_8 (millions)	Comments
1999					One production raise mined »50,000lbs U_3O_8. Pounds carried over to 2000.
2000	43.7	11.6	11.174	7.800	
2001	48.0	16.2	17.166	11.983	
2002	52.5	16.0	18.524	12.931	
2003	45.4	15.2	15.243	10.641	Three-month shutdown due to water inflow event.
2004	55.9	15.2	18.699	13.053	
2005	60.4	13.9	18.512	12.922	
2006	57.6	14.7	18.698	13.052	
2007	59.6	14.2	18.718	13.066	
2008	53.2	14.9	17.502	12.218	
TOTAL	**476.3**	**14.7**	**154.236**	**107.666**	

Cameco s share of production of U_3O_8 at McArthur River/Key Lake was 11.6 million pounds for 2008, 0.4 million pounds less than the previous estimate of 12.0 million pounds. The production shortfall resulted from various process and equipment problems experienced at Key Lake. The problems encountered were corrected and Cameco s share of production for 2009 is expected to be 13.1 million pounds. Average metallurgical mill recovery for 2008 was 98.34%.

7 GEOLOGICAL SETTING

7.1 Regional Geology

The McArthur River deposit is located in the south-eastern portion of the Athabasca Basin, within the south-west part of the Churchill structural province of the Canadian Shield.

The Wollaston Domain, together with the Mudjatik Domain and the Virgin River Domain, form the Cree Lake Mobile Zone of the Churchill Structural Province (Lewry et al., 1978). The McArthur River area overlies the Wollaston Domain, near the contact with the Mudjatik Domain (see Figure 6). In general terms, the Wollaston Domain consists of Archean granitoid gneisses overlain by an assemblage of Aphebian pelitic, semipelitic, and arkosic gneisses, with minor interlayered calc-silicates and quartzites. These rocks are overlain by an upper assemblage of semipelitic and arkosic gneisses with magnetite bearing units. The major uranium deposits of the eastern Athabasca region, including McArthur River, are associated with graphitic members of the lower assemblage. The majority of the Wollaston Domain rocks have been influenced by mid to upper amphibolite facies metamorphism.

The Wollaston Domain basement rocks are unconformably overlain by flat lying, unmetamorphosed sandstones, and conglomerates of the Helikian Athabasca Group which is a major aquifer in the area.

Figure 6 McArthur River Property, Regional Geology

7.2 Local Geology

7.2.1 General

The McArthur River mineralization, generally occurring at depths ranging from 500 m to 640 m, is structurally controlled by the northeast-southwest trending (45º azimuth) P2 reverse fault which dips 40-65º to the southeast. In the deposit area, the fault has thrust a sequence of Paleoproterozoic graphitic metasedimentary rocks into the overlying late Paleoproterozic (Helikian) Athabasca Group sediments. The vertical displacement of the thrust fault exceeds 80 m at the northeast end of the deposit decreasing to 60 m at the southwest end.

The sub-Athabasca basement consists of two distinct metasedimentary sequences: a hanging-wall pelitic sequence of cordierite- and graphite-bearing pelitic and psammopelitic gneiss with minor meta-arkose and calc-silicate gneisses, and a sequence consisting of quartzite and silicified metaarkose and rare pelitic gneisses.

The Wollaston Domain stratigraphy in the deposit area has been divided by the mine geology staff into three blocks, based on their lithological and structural characteristics. Uppermost is the Hanging Wall Block, consisting of biotite and garnet gneiss, and calcsilicate. The Middle Block consists of cordierite gneiss, graphitic cordierite gneiss, biotite gneiss, and arkose. The main graphitic fault zone lies within the upper 20 m of the Middle Block. Underlying these units is the Quartzite Block, consisting of massive to faintly laminated quartzite. Quartzite was more resistive to erosion than the gneissic units and as a result the quartzite exists at the unconformity as a paleotopographic ridge. Pegmatite and granitic veins occur within all basement lithologies.

Athabasca Group rocks vary in thickness from 480 m over the hanging wall to 560 m over the footwall and consist of the units A, B, C, and D of the Manitou Falls Formation (see Figure 7. A basal conglomerate containing pebbles and cobbles of quartzite unconformably overlies the crystalline rocks of the Wollaston Group.

Six significant mineralized bodies (Zones 1, 2, 3, 4, A & B) are present, five of which are located in the sandstone wedge of the footwall (see Figure 8). The Zone 2 orebody is predominantly basement hosted and occurs largely in the footwall of the P2 reverse fault (see Figure 7 and Figure 10). Over 150 million pounds U_3O_8 were extracted from Zone 2. It contains one third of the current McArthur River uranium Mineral Reserves.

The major structural feature of the deposit is the P2 fault; however, a series of steeply dipping, east-southeast west-northwest transcurrent faults (100° 110°) are also present. Those faults locally displace mineralization (see Figure 9).

lteration minerals in the sandstone are mostly quartz, kaolinite, chlorite, and dravite. Basement alteration includes illite, chlorite, and dravite, with local apatite and carbonate. The unusual characteristics of this mineralization include an abrupt transition from weakly altered basement host rock to intense chlorite alteration and monomineralic high-grade uranium mineralization over distances of less than a metre. Two uranium-rich whole-rock samples were dated by the U/Pb method and provided upper intercept discordia ages of 1348 ± 16 and 1521 ± 8 Ma, the older being interpreted as the age of the primary uranium mineralization and the younger as the age of a remobilization event.

Figure 7 McArthur River Deposit Schematic Cross-Section

7.3 Structure

The northeast trending P2 thrust fault is the dominant structural feature of the McArthur River deposit (see Figure 8 and Figure 10). As a general rule, thrust faulting occurs along several graphite-rich fault planes within the upper 20 m of the Middle Block basement rocks. These faults parallel the basement foliation and rarely exceed one metre in width. Structural disruption is more severe in the overlying brittle and flat lying sandstone, evidenced by broad zones of fracturing and brecciation. Zone 4 mineralization is typical for the majority of the deposit, occurring in the vicinity of the main graphitic fault zone, at or near the contact between the upthrust basement rocks and the Athabasca sandstone. The tectonic setting for Zone 2 differs from the remainder of the deposit. At Zone 2, the Quartzite Block occurs within 50 m of the main graphitic fault zone, closer than anywhere else on the deposit. While the movement along the thrust fault is limited to the main graphitic unit over the remainder of the deposit, at Zone 2 the entire middle block is also uplifted, appearing to ride along the eastern slope of the quartzite ridge. Zone 2 mineralization is almost entirely hosted within this structurally disrupted Middle Block.

Two sets of cross faults are present at McArthur River, they strike at 100-110º and at 160-170º, both steeply dipping and generally within 30º of vertical. Although displacement across these faults appears to be relatively minor, they are interpreted to have had a significant impact on the orebody, often truncating zones of high-grade mineralization. Figure 9 is a plan view of the 950 m elevation illustrating the interpreted 100-110º faults.

A significant vertical fault developed, at least locally, in the Zone 2 area. The faulted zone along the eastern edge of the Quartzite Block exists as a zone of very weak ground, consisting of sand, clay, and high pressure water that has proven very difficult to drill.

Figure 8 Underground Development and Mineralized Zones from Drilling

Figure 9 Plan View of Zone 2

7.3.1 Alteration

As in most Athabasca basin deposits, host rock alteration has played a critical role in the development of rock strength and geochemistry.

The most relevant aspects of alteration in terms of mining and development of the deposit are:

- the effect of alteration on ground stability, particularly when associated with tectonism,
- the relationship between alteration and groundwater movement, and,
- the effect of alteration on rock chemistry particularly waste rock and its acid generating capability.

Although all rocks at McArthur River are altered to some degree, the alteration is strongest in or near faults, often associated with mineralization. The nature and effect of the alteration also varies depending on rock type or location. For example, strong clay alteration greatly decreases rock strength while at the same time impeding the flow of water in fault zones. From a mining perspective, this is both a positive and negative effect.

Pervasive silicification is the predominant alteration characteristic of the sandstone. Intensity of silicification increases 375 m below surface and continues to the unconformity. While this process reduced permeability of the sandstone in general, and prevented development of a clay alteration halo around the mineralization, this brittle sandstone is strongly fractured along the path of the main fault zone. Ground conditions in this area are poor, with high fracture density and permeability.

In the pelitic hanging wall basement rocks above the thrust fault, chloritization is common. Graphitic zones and clay filled faults require appropriate ground control. Pyrite-bearing rocks, often associated with graphitic units, require proper waste rock management to control potential acid mine drainage.

Similarly, in the basement hosted Zone 2, the overlying gneisses are strongly chloritized, intensely dravitized, and bleached in areas. The contact with the underlying quartzite is typically faulted and highly altered, resulting in poor ground conditions and high permeability. This area has been frozen prior to mining.

A final zone of alteration is the paleoweathered surface of the basement. This zone extends for varying depths from the unconformity downwards and is common throughout the basin. At McArthur River the paleoweathered zone is generally hard, competent, and hematized. The zone is thicker and more conspicuous in the footwall basement rocks, hydrothermal alteration having overprinted much of the paleoweathering profile in the hanging wall basement wedge.

7.4 Property Geology

All of the McArthur River ore zones are associated with the graphitic P2 thrust fault. With the exception of Zone 2, most of the mineralization in Zones 1, 3, 4, A and B occurs in both the Athabasca sandstone and adjacent basement rocks, near the main zone of thrust faulting. Mineralization is generally within 15 m of the basement/sandstone contact with the exception of Zone 2.

Zone 2 mineralization occurs deeper in the basement rock in a unique area of the deposit (see Figure 10). At Zone 2, a massive footwall quartzite unit lies in close proximity to the main zone of thrust faulting. The presence of this quartzite unit has resulted in a structurally disrupted zone that has affected a wide block of the footwall basement rocks. This 100 m long segment of the basement rock hosts the Zone 2 mineralization. To the north and to the south, the quartzite unit trends away to the west and the tectonics of the thrust fault returns to a more planer nature (Figure 10).

Figure 10 Typical Zone 2 Geological Section Looking North

8 DEPOSIT TYPES

McArthur River is an unconformity-associated uranium deposit. The geological model was confirmed by underground drilling, development and production activities. Similar deposits include: Rabbit Lake, Key Lake, Cluff Lake, Midwest Lake, McClean Lake, Cigar Lake and Maurice Bay in the Athabasca uranium district (Saskatchewan, Canada), Kiggavik (Lone Gull) Thelon Basin district (Nunavut, Canada), Jabiluka, Ranger, Koongarra and Nabarlek, Alligator River district (Northern Territory, Australia). Although these deposits belong to the unconformity-associated model, all are different. Uranium mineralization in the Nunavut and Australian deposits is all hosted in the basement lithologies whereas in the Athabasca deposits, mineralization is present in both the basement and overlying sandstone. Another key difference is that the Athabasca deposits are of considerably higher grade.

Unconformity-associated uranium deposits comprise massive pods, veins, and/or disseminations of uraninite spatially associated with unconformities between Proterozoic siliciclastic basins and metamorphic basement. The siliciclastic basins are relatively flat-lying, un-metamorphosed, late Paleoproterozoic to Mesoproterozoic, fluvial red-bed strata. The underlying basement rocks comprise tectonically interleaved Paleoproterozoic metasedimentary and Archean to Proterozoic granitoid rocks. Uranium as uraninite (commonly in the form of pitchblende) is the sole commodity in the monometallic sub-type and principle commodity in the polymetallic sub-type that includes variable amounts of Ni, Co, As and traces of Au, Pt, Cu and other elements. Some deposits include both sub-types and transitional types, with the monometallic tending to be basement-hosted, and the polymetallic generally hosted by basal siliciclastic strata and paleo-weathered basement at the unconformity.

Uranium minerals, generally pitchblende and coffinite, occur as fracture and breccia fillings and disseminations in elongate, prismatic-shaped or tabular zones hosted by sedimentary/metasedimentary rocks located below, above or across a major continental unconformity. Orebodies may be tabular, pencil shaped or irregular in shape extending as much as a few kilometres in length. Most deposits are limited to less than a 100 m below the unconformity. The Jabiluka and Eagle Point deposits, however, are concordant within the Lower Proterozoic host rocks and extend for several hundred metres below the unconformity. Most deposits fill pore space or voids in breccias and vein stockworks. Some Saskatchewan deposits are exceptionally rich with areas of massive pitchblende/coffinite. Features such as drusy textures, crustification banding, colloform, botryoidal and dendritic textures are present in some deposits. The mineralogy of these deposits is typically pitchblende (Th-poor uraninite), coffinite, uranophane, thucolite, brannerite, iron sulphides, native gold, Co-Ni arsenides and sulpharsenides, selenides, tellurides, vanadinites, jordesite (amorphous molybdenite), vanadates, chalcopyrite, galena, sphalerite, native Ag and PGE. Some deposits are simple with only pitchblende and coffinite, while others are complex and contain Co-Ni arsenides and other metallic minerals. McArthur River fits into the simple category as it is essentially monomineralic uraninite.

Typical alteration consists of chloritization, hematization, kaolinization, illitization, and silicification. In most cases hematization is due to oxidation of ferrous iron bearing minerals in the wallrocks caused by oxidizing mineralizing fluids. The intense brick-red hematite adjacent to some high grade uranium ores is, however, probably due to loss of electrons during radioactive disintegration of U and its daughter products. An interesting feature of the clay alteration zone is the presence of pseudomorphs of high grade metamorphic minerals, such as cordierite and garnet, in the retrograded basement wallrock.

The location of mineralization is controlled by a mid-Proterozoic unconformity and favourable stratigraphic horizons within Lower Proterozoic host rocks. These strata are commonly graphitic. Local and regional fault zones that intersect the unconformity are also important features.

Deposits of this type are believed to have formed through an oxidation-reduction reaction at a contact where oxygenated fluids meet reducing fluids. The unconformity provides that contact. Graphitic faults like the P2 fault at McArthur River may have been the conduit for the reducing fluids.

The geological setting at McArthur River is similar to that of Cigar Lake in that the sandstone overlying the basement rocks of the deposit contains significant water at hydrostatic pressure.

9 MINERALIZATION

Uranium mineralization has been delineated from surface drilling over a strike length of 1700 m and occurring at depths ranging between 500 m to 640 m below surface. Ore widths are variable along strike but the most consistent, high grade mineralization occurs proximal to the main graphitic thrust fault around the nose of the upthrust basement block. Less consistent and generally lower grade mineralization occurs down dip along this fault contact between basement rock and sandstone.

The P2 thrust fault is the most important mineralization control for the McArthur River deposit. Uranium occurs in both the Athabasca sandstone and the overlying basement rock near the main zone of thrust faulting. Mineralization is generally within 15 m of the basement/sandstone contact with the exception of Zone 2. Less significant zones of mineralization may occur further from the contact, usually in the sandstone, associated with subsidiary fracture/fault zones or along the margins of flat lying siltstone beds.

Zone 2 mineralization occurs deeper in the basement rocks in a unique area of the deposit. Here a footwall quartzite unit lies in close proximity to the main zone of thrust faulting. In this area of structural disruption, high-grade mineralization occurs not only in the hanging wall basement wedge but also overlies the footwall quartzite unit. The pelitic host rock in this basement zone is relatively competent but strongly chloritized. The strike extent of this deeper basement mineralization is approximately 100 m.

In general, the high-grade mineralization, characterized by botryoidal uraninite masses and subhedral uraninite aggregates, constitutes the earliest phase of mineralization in the deposit. Pyrite, chalcopyrite, and galena were also deposited during this initial mineralizing event. Later stage, remobilized uraninite occurs as disseminations, veinlets, and fracture coatings within chlorite breccia zones and along the margins of silt beds in the Athabasca sandstone. Nickel, cobalt, and arsenic bearing minerals have only been detected in trace amounts with the aid of a microscope.

10 EXPLORATION

Mineral Lease ML-5516, which hosts the McArthur River deposit, sits on the western edge of a block of 21 claims which comprise the McArthur River project.

10.1 Asamera 1976 1979

In September 1976, the Keefe-Henday Joint Venture was formed between Canadian Kelvin Resources Ltd. and Asamera. This joint venture included all of what would later become the Dawn Lake, Waterbury Lake (portions of which are now known as Cigar Lake), and McArthur River projects. Asamera, as the operator, conducted various field investigations from 1976 to 1979, including airborne and ground geophysical surveys followed by lake sediment and water sampling programs. Seventeen diamond drill holes were completed during the 1978 and 1979 campaigns on what is now known as the McArthur River property.

10.2 SMDC / Cameco 1980 1993

In January of 1980, SMDC took over as operator of the McArthur River project. During the years 1980 to 1992, SMDC (which merged with Cameco in 1988) completed various airborne and ground geophysical programs, lake sediment and water sampling programs, boulder prospecting, and substantial diamond drilling.

Surface exploration on the McArthur River project was halted in 1993 with the shift in focus to the development of the McArthur River mine. Refer to Section 6.2.2 P2 Grid Exploration History, for a discussion of exploration drilling that resulted in the discovery of the McArthur River deposit.

10.3 Recent Exploration 2000 Present

Surface exploration resumed on the McArthur River project in 2000 (see Table 10-1) after an eight year hiatus in drilling (see **Table 11-1**). In 2000 2001, historic geological and geophysical data was compiled and reassessed. Project-wide coverage by an airborne GEOTEM survey and geochemical surveys over select portions of the project area were also undertaken during this period.

During 2002 2004, airborne (magnetic gradiometer) and ground (resistivity, gravity, TDEM and AMT) geophysical surveys refined the basement geology along the P2 trend. Diamond drilling during this period predominantly focused on the P2 trend both to the north and south of the mine. A total of 7,400 m in 14 holes were drilled in this three year period. Positive drill results from 0.1% over 1.0 m to 12.1% U_3O_8 over 30 m north of the Pollock Shaft, culminated in the definition of Zone A.

Consecutive diamond drill programs (2005 2008) have continued to evaluate the P2 trend, north of the current underground workings. During this period almost 39,000 m was drilled in 70 drill holes comprising a combination of conventional and directional drilling. In 2005, systematic surface diamond drilling to evaluate the P2 trend north of the McArthur River mine commenced. The P2 structure has now been tested at approximately 200 m intervals for a distance of four kilometres north of the mine. Results continue to be encouraging. High-grade mineralization (including 36% U_3O_8 over 30 m) was encountered 500 m north of Zone A and low-grade mineralization, intersected by multiple holes, a further 600 m along strike of the P2 trend. Drill definition of this mineralization (Zone B), as well as continuation of the drill testing of the northern strike of the P2 trend, is on-going.

Exploration efforts over the past several years have demonstrated that the P2 trend is still a prime target for finding additional high-grade deposits. As currently defined, the P2 trend extends for 18 km but has only been adequately tested from surface for approximately 6.0 km leaving 65% of this highly prospective trend untested or significantly under-tested. The positive drill results encountered over the last several years confirm that the potential for significant uranium mineralization is still present along strike to the north and south.

The focus in 2009 is for underground drilling in the south of Zone 4, labelled Zone 4 South, and conversion of Mineral Resources to Mineral Reserves. Tunnelling of a north exploration drift was initiated in 2007 to follow-up on the surface exploration drilling results. The north exploration development will likely continue in 2010, followed by an underground diamond-drilling program to delineate Zones A and B, previously identified from surface, in order to develop mine plans (See

Surface drill testing of the regional P2 fault structure north of the mine will be completed by the first quarter of 2009. Systematic surface evaluation of the P2 fault structure south of the mine, by designed 200 m spaced drillhole coverage, is planned for consecutive diamond drill programs in 2009 2010.

The 2009 budget for underground delineation diamond drilling is for 6,500 m. This includes approximately 5,000 m (50 holes) for Zone 4 South and 1,500 m (15 holes) for Zone 1.

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Table 10-1: Summary of Surface Exploration at McArthur River 2000 2008

	Drilling			Airborne Geophysics		Ground Geophysics		Other Exploration
Year	**Type**	**No. Holes**	**Metres Drilled**	**Type**	**Line (km)**	**Type**	**Length (km)**	**Type**
2000								Compilation, Historical drillcore logging and sampling, Soil gas
2001				GEOTEM	1,533			Compilation, Historical drillcore logging and sampling, Soil gas
2002	Core	4	2,618			Gravity	19.3	Compilation, Historical drillcore logging and sampling
						Pole-Dipole Resistivity	21.6	
						AMT -Audio magnetotellurics	68 Stations	
2003	Core	2	1,299	Triaxial Gradiometer	1,176	Fixed Loop TEM	38.2	Historical drillcore logging and sampling, SPOT5 Satellite Imagery
						Pole-pole resistivity	12.3	
2004	Core	8	3,481			Fixed Loop TEM	137	

						In-loop Soundings	23.1	
2005	Core	5	3,309					
2006	Core	10	5,361					LIDAR DEM survey, Historical drillcore logging and sampling
2007	Core	25	13,840	Triaxial Gradiometer	4,457	Fixed Loop TEM	332.6	Compilation, Historical drillcore logging and sampling
						In-loop Soundings	3.45	
2008	Core	30	16,479					
Total		**84**	**41,026**		**5,633**		**584.2**	

Figure 11 Map of Surface Drilling

11 DRILLING

11.1 Surface Drilling

Surface drilling operations have been carried out by a variety of contractors since 2002. Major Midwest Drilling Inc. (Midwest) of Flin Flon, Manitoba carried out the 2002 drill program using a Boyles 38 drill mounted on skids and other ancillary equipment. Drill hole deviation surveys were completed by Midwest using a Reflex EZ-SHOTä instrument.

Boart Longyear Inc. (Longyear) of Saskatoon, Saskatchewan completed all diamond drilling operations on the McArthur River operation between 2003   2006. One skid-mounted Longyear 50 drill and ancillary equipment was utilized for these drill programs. Longyear personnel completed drill hole deviation surveys using a Reflex EZ-SHOTä instrument.

Hy-Tech Drilling Ltd. (Hy-Tech) of Smithers, British Columbia, has carried out drilling operations since 2007. Two skid mounted Tech-5000 drill rigs and ancillary equipment were utilized for these drill programs. Hy-Tech personnel completed drill hole deviation surveys using a Reflex EZ-SHOTä instrument

A computer-coded core logging system was used for logging and storing drill core data. Drill core data was collected and entered directly into IPAQ® Pocket PC and Palm™ handheld organizers. Core radioactivity was measured and recorded using an SRAT-SPP2 scintillometer.

All holes were radiometrically probed with a combination of Mount Sopris logging equipment. Probe selection was based on anticipated grades expected from visual and radiometric examination of the core. All probing equipment is calibrated at the beginning of each field season using reference pits containing known grades of uranium ore, at the Saskatchewan Research Council (SRC) facilities in Saskatoon.

All drill hole locations are verified in the field by differential GPS or in the case of holes near the mine infrastructure by the mine site surveyors. The location of the surface drill holes is shown on Figure 12. A summary of surface drilling by year is shown in **Table 11-1**. Holes are generally drilled on sections spaced at between 50 and 200 m with 12 to 25 m between holes on a section where necessary. Drilled depths average 670 m. Vertical holes generally intersect the mineralization at angles of 25 to 45 degrees, resulting in true widths being about 40% to 70% of the drilled width. Angled holes usually intercept the mineralized material perpendicularly, giving true width.

Figure 12 Surface Drill Collar Location Map

Table 11-1: Summary of Surface Drilling by Year

Year	Company	No. of Holes	Metres Drilled
1978	Asamera	4	1,187
1979	Asamera	13	2,764
1980	SMDC	22	6,412
1981	SMDC	42	10,731
1982	SMDC	35	9,877
1983	SMDC	19	7,445
1984	SMDC	19	9,092
1985	SMDC	17	8,766
1986	SMDC	9	5,302
1987	SMDC	29	16,123
1988	SMDC	15	8,473
1989	Cameco	14	9,118
1990	Cameco	15	9,585
1991	Cameco	15	9,330
1992	Cameco	25	8,933
1996	Cameco	3	1,662
2002	Cameco	4	2,618
2003	Cameco	2	1,299
2004	Cameco	8	3,481
2005	Cameco	5	3,309
2006	Cameco	10	5361
2007	Cameco	25	13,840
2008	Cameco	30	16,479
Totals		**380**	**161,857**

11.2 Underground Drilling

Underground delineation drilling began in 1994 using a 60 HP LM37 drill. It soon became apparent that drilling conditions were extremely challenging. High water pressures combined with zones of sand and clay were often impossible to drill through and occasionally threatened the security of the mine and the safety of the drillers.

As a result, the concept of drilling under pressure , to duplicate surface drilling conditions, was proposed. N. Morissette of Haileybury, Ontario designed the necessary equipment to drill under pressure and since then virtually all of the drilling at McArthur River has used this collar security as well as 120 HP, LM75 or 200 HP, LM150 drills.

This system, which uses an auxiliary Bean Pump, allows the driller to pump water down the drill rods and down the annulus of the hole simultaneously. The hole can be kept under full or partial pressure by adjusting the discharge. Under full pressure, all cuttings must flow into the formation.

Detailed delineation diamond drilling has been completed from underground drill bays over a strike length of 750 metres, although a few sections still require some additional fill-in drilling. All of this detailed drilling has occurred over the southern portion of the deposit (see Figure 13). Underground development has begun on the northern portion of the deposit, which will allow for future delineation drilling.

The delineation drilling has been accomplished from 30 m spaced drill bays excavated on the western side of the main drift on the 530 level. Each drill bay would have one section of holes drilled directly west (on the mine grid), followed by sections that are angled just to the north and just to the south, ultimately resulting in three, 10 m spaced sections through the orebody. Hole spacing within each section is targeted to be 10 metres, at the expected mineralized intersection. Each hole was gamma logged with a downhole radiometric probe. Radiometric probing was at 0.1 m spacing in the radioactive zones and 0.5 m in unmineralized zones. Deviation measurements were taken with either a Sperry Sun instrument or a Reflex Maxibor® instrument. Collar locations were surveyed after the drill moved out of the bay.

Underground exploration drilling and development continued in 2008. Activity for 2009 focuses on evaluation of Mineral Resources, mainly to the south of the estimated McArthur River Mineral Reserves. In 2008, Cameco concluded that Mineral Resources to the south of the mine have greater near-term development potential for future mining due to established infrastructure and were made a higher priority exploration target. Mineral Resources to the north of the mine are planned for further evaluation in either late 2009 or 2010, depending on the progress made in the south of the mine.

Figure 13 Map of Underground Drilling

11.3 Core Logging Underground Diamond Drilling

The drill core was systematically logged, photographed, and racked outdoors. Drill hole data was entered into a geological database. Cross sections were generated and interpretations were made by the geologists. The procedures are as follows:

From the drill to the core yard:

Core is drilled and placed in boxes by the drillers. Run markers are placed at the end of each run. At the completion of each box, a lid is placed on the box and secured in place then stacked on a pallet. At the completion of the hole the boxes are secured to the pallet and the core is moved to the shaft station to be hauled to surface. Once on surface, the pallet is hauled to the core yard by site services.

Move the core into the core shack:

The first box is hauled into the core shack and placed on the rack. The lid is removed and the core is scanned with a SPP2 scintillometer. Any boxes with readings greater than 500 counts per second (cps), after correction for background radioactivity have their ends painted red. This process is continued, arranging the boxes in numerical order, until the end of the hole.

Labeling:

The beginning depth of each core box is measured from the closest run marker and written on the top left corner. Labels are generated using a metal punch tape and stapled to each box. Information on the label includes the hole number, box number and the depth interval.

Core Recovery:

This log records the percentage of core recovered from an individual drilling interval. The length of core recovered between run blocks is measured. The recovery percent is the ratio of the measured length to the drilled length.

Mineralization:

The boxes with red ends (>500 cps) are measured for mineralization. After determining the background reading near the scanning area, the first red painted core box is laid on the scanning area and marked up in 10 cm intervals. With a lead-shielded SPP2 the core is scanned in 10cm intervals until the end of the box and the readings are marked on the box as well as recorded on paper.

Geotechnical Log:

Geotechnical logging assigns a visual rock competency value to the drill core. Whenever the rock competency changes the interval and value are recorded.

Rock Mass Rating:

RMR logging considers five factors each of which is assigned a number from a discrete range. The five numbers are added together to calculate the overall rock mass rating for each interval and recorded.

Lithology Log:

The lithology log describes in sequence all major lithology units. Within each unit major structures, fracture intervals, alteration, mineralization, foliation, as well as overall rock competency are also described and recorded.

Photography:

Core boxes are laid out in order on the photo rack.. The core is sprayed with water and digital photos are taken. Digital photos are printed and filed with the rest of the core logs as well as stored electronically. At this point the core is hauled outside to the core racks.

Throughout these steps a Core Shack Information Sheet stays with the core and is used to indicate which logs have been completed, and which logs still need to be completed.

11.4 Core Logging Exploration Surface Drilling

Core logging of surface drill holes on the McArthur River project begins with geotechnical work. A geotechnician enters data for box intervals, RQD (fractures or breaks as well as recovery in each row), RMR (Rock Mass Rating, a system that determines strength of intervals of core), Ballmark (core orientation continuity) and pebble counts for each row. This data is entered into a Palm Pilot which is then uploaded into an Access database on a project laptop. From that point the data is imported into DH Logger from the Access database.

A geologist examines the core and determines its overall characteristics. These include lithology, alteration, structure and mineralization. This information is uploaded into an Access database on a project laptop. Data is imported to DH Logger in the same manner as with the Palm Pilots.

Digital photographs are taken once all the information is gleaned from the core. The core is then stacked nearby until it can be moved to a permanent spot at the Bermuda Core Storage, located 7.5 km from the McArthur River operation.

11.5 Cementing of Surface Diamond Drill Holes

After a diamond drill hole is completed it is cemented from the bottom up to the first unconformity. A Van Ruth plug is set just below the unconformity to seal off basement-related fluids. From there, the cementing procedure depends on two factors: another unconformity and/or fault zone. If there is another unconformity the hole is cemented from the first Van Ruth plug, then another plug is set just below the second unconformity and cement is poured on top of this last plug. If there is an extensive fault zone (>10 m) in the lower sandstone above an unconformity, cementing continues from the first plug. This is done until a Van Ruth plug is set above the structure and 50 m of cement is poured on top of that plug. This cementing procedure has been incorporated as standard practise on the McArthur River project since 2004.

This procedure is followed for all mineralized holes as well as any holes nearby. There are rare holes that have gone without cement but they were not mineralized and located over four km from the current mine workings.

Supplemental to the above procedure, since 1996, 28 old surface drill holes that were anticipated to come within 50 m of projected future mine workings, had their collars located and cement poured into the hole until it reached the collar.

12 SAMPLING METHOD AND APPROACH

12.1 Sample Density and Sampling Methods

Surface holes are generally drilled on sections spaced at between 50 and 200 m with 12 to 25 m between holes on a section where necessary The surface drill hole spacing is illustrated on Figures 11-1, Underground delineation drilling is performed on a 10 m by 10m grid spacing in the plane of the mineralization. The underground drill hole spacing is represented on Figure 11-2, in the previous section, and on Figure 12-1.

Surface

Any stratigraphy exhibiting noteworthy alteration, structures and radiometric anomalies was sampled. Specific basement sampling procedures were based on the length of the interval to be sampled, and attempts were made to avoid having samples cross lithological boundaries.

All core with a radioactivity >1000 cps (SPP-2) is sampled for assay. Core is split with a Longyear splitter; one half of the core is placed in a sample bag while the other half is retained in the core box. A sample tag with a unique sample number is placed in the bag while a duplicate sample tag remains in the sample book. Each bag is also numbered with the sample number on the outside of the bag. An aluminium label having the same sample number is placed on the core box. Depending on the level of radioactivity, samples are either shipped in metal or plastic pails.

Underground

Core from underground drill holes may be sampled to ascertain the U_3O_8 content past the probing limit of a hole or to provide correlation samples to compare against a probed interval. Occasionally there would be portions of the mineralized zone that were not probed, usually because the hole was dipping upwards, and the probe could not be pushed far enough up the drill rods to reach the entire mineralized zone. In these circumstances, the core was logged and photographed as always, and then sampled for uranium analyses. If the sampling is past the probe limit, samples are taken 1.0 m before the end of the probe data to provide an overlap. Rather than splitting the core, the entire interval was sampled.

Using the mineralization log, high-grade and low-grade intervals are sampled separately. Sample widths varied depending on rock type, grade consistency, or any other characteristic of the core that would indicate a logical sample break. When sampling past the probe limit of a hole the minimum sample interval used is 0.3 m and the maximum interval is 1.0 m

For correlation purposes, the mineralization log and probed data intervals are used to identify high-grade peaks to correlate an interval to sample. The high-grade and low-grade intervals are sampled separately. When sampling for correlation purposes the minimum sample interval is 0.1 m to isolate massive pitchblende stringers and the maximum sample interval is 1.0 m.

The following information is recorded:

Hole number, date and name

Sample number: numbers are in numerical order on stamped plastic tags

From and To intervals, Length

Recovered Length: actual measured core length (rubble estimated)

SPP2 range of radioactivity: use the range previously written on the box

Weight: weigh of the sample in the plastic sample bag.

Core diameter: when sampling for correlation purposes, a calliper is used (averaging 4 measurements).

Description: rock type, alteration, mineralization.

The sample number is written on a plastic bag and the samples are placed within. The numbered plastic tag is also inserted into the bag. The bags are tied securely and placed in a five gallon metal shipping drum. The drum is marked to indicate the samples contained within it. The samples are scanned by the radiation department then taken to the warehouse where they are shipped off site according to procedures for transporting radioactive material.

Due to the radioactive nature of the samples, they were shipped to the SRC laboratory in Saskatoon under the Transportation of Dangerous Goods regulations. The laboratory results were added to the database after they were received.

12.2 Core Recovery

For surface holes, all uranium grade data is obtained from assaying core. Core recovery is generally considered to be excellent with local exceptions. For underground drill holes, a small portion of the assay data used for resource estimation is generated by assaying core where the radiometric probe could not be pushed completely to the end of the hole. Core recovery in those areas can be excellent to poor. No problems relating grade to core recovery were noted.

12.3 Sample Quality and Representativeness

The quality and representativeness of the surface drill hole samples is adequate for resource estimation. This has been validated on numerous occasions with underground drilling results in the vicinity of mineralized intervals drilled from surface.

Few underground drill samples are analyzed because a gamma probe is used to determine grade in the holes. Drilling is done from 30 m spaced drill stations with three fans of holes from each station. This provides coverage of about 10 m across the deposit which is considered to be adequate for resource estimation. The drill hole fans provide representative access for the gamma probes across the entire deposit.

When physical samples are collected as a result of the inability to insert the gamma probe, whole core is used. This provides very high-quality samples in those areas.

Sample quality and representativeness is adequate for resource estimation and mine planning.

12.4 Sample Composites with Values and Estimated True Widths

In general, the edges of the mineralized zones exhibit very sharp boundaries with non-mineralized host rock. A table that summarizes the mineralized intercepts at McArthur River is presented in Appendix 1 (see Appendix 1 Summary of Mineralized Intercepts at McArthur River).

Underground drill holes are collared from drill bays spaced 30 m apart and located 35 to 60 m in the hanging wall from the mineralization. Three general sets of drill directions are collared: the middle fence is drilled perpendicular to the strike of the mineralization and a north and south fence are drilled approximately ± 6° - 12° off azimuth from the middle fence to maintain a 10 m section spacing. Each fence then delineates the mineralization with hole angles ranging from +45° to -70°. The resulting drill hole intersection with the mineralization generally varies from perpendicular to 25°. Depending on the angle, drilled length represents true width to 2.4 times the true width. Figure 14 illustrates the drillhole traces on a vertical section with their profiles of radioactivity and interpreted faults. Existing mine openings are shown in white.

Figure 14 Typical Underground Drill Hole Spacing Section Looking North

13 SAMPLE PREPARATION, ANALYSES AND SECURITY

13.1 Sample Preparation by Cameco Employees

Beyond marking and bagging samples by Cameco employees, Cameco employees, officers, directors and associates are not, and have not, been involved with preparation of samples.

13.2 Sample Preparation

13.2.1 Introduction

All samples collected from McArthur River for determining uranium content by chemical analysis and used in the Reserve and Resource estimates were sent to Saskatchewan Research Council (SRC) for analysis. It should be noted however that a few of the earlier surface drill holes had their samples sent to another lab for analysis because at that time, SRC was not able to analyse the very high grade samples. None of these samples were used in the estimate as they were replaced by underground diamond drill holes which use primarily probe data. All underground diamond drill sample sent out for chemical analysis were done by SRC.

Multi-element analysis was generally performed on the same samples that were analysed for uranium content. Some of the elements required special equipment in order to deal with the radioactive saturation from high grade samples. Prior to SRC purchasing this equipment, some samples were sent to another lab to complete the analysis. Only SRC and uranium analysis is material to this Technical Report.

This section reviews the procedures used at SRC Geoanalytical Laboratories located in Saskatoon for the safe receipt and handling of materials to be analysed for uranium. . There are three main sample processing areas for uranium analysis at SRC:

- sandstone samples (Main Laboratory);
- low radioactive basement samples: red line to 1 dot samples (Main Laboratory); and
- high radioactive basement samples: 2 dot and higher (Radioactive Facility).

13.2.2 Sample Receiving

Samples are received at the site as either dangerous goods (qualified Transport of Dangerous Goods TDG personnel required) or as exclusive use only samples (no radioactivity documentation attached). On arrival, samples are assigned a SRC group number and are entered into the Laboratory Information Management System (LIMS).

All received sample information is verified by sample receiving personnel: sample numbers, number of pails, sample type/matrix, condition of samples, requests for analysis, etc. The sample is then sorted according to its radioactivity level.

13.2.3 Sample Sorting

To ensure that there is no cross contamination between sandstone and basement samples, non-mineralized, low-level and high-level mineralized samples, they are sorted according to their matrix and radioactivity levels (see Figure 15).

Samples are first sorted into groups according to matrix type (sandstone and basement/mineralized).

Then the samples are checked for their radioactivity levels. Using a Radioactivity Detector System, the samples are classified according to their radioactivity as follows:

Red line (minimal radioactivity) < 500 counts/second

1 dot 500 1999 counts/second

2 dot 2000 2999 counts/ second

3 dot 3000 3999 counts/second

4 dot 4000 4999 counts/second

UR (unreadable) 5000 counts/second and greater

Samples are then sorted into ascending sample numerical order and transferred to their matrix-designated drying ovens.

13.2.4 Sample Preparation

All samples are dried. After the drying process is completed, Red line and 1 dot samples are sent for further processing (crushing and grinding) in the main geoanalytical laboratory. This is done in the SRC basement preparation area. All radioactive samples at 2 dots or higher (2000 counts/second or greater) are sent to the SRC secure radioactivity facility for the same sample preparation. All highly radioactive materials are kept in a radioactive bunker until they can be transported by TDG trained individuals to the SRC radioactivity facility for processing.

When sample pulps are generated they are then returned to the main laboratory to be chemically processed prior to analysis. All containers are identified with sample information and their radioactivity status at all times. When the preparation is completed the radioactive pulps are then returned to a secure radioactive bunker, until they can be transported back to the radioactive facility.

All rejected sample material not involved in the grinding process is returned to the original sample container. All highly radioactive materials are stored in secure radioactive designated areas until it is returned to the customer.

Rock samples are jaw crushed to 60% @ -2mm and 100-200g sub-sample split using a riffle splitter. The sub sample is pulverized to 90% @ -106 microns using a puck and ring grinding mill. The pulp is then transferred to a labeled plastic snap top vial.

Figure 15 Schematic of Sample Preparation Procedures

13.2.5 Summary of Licenses, Certifications and Registrations

The SRC laboratory is licensed by CNSC for possession, transfer, import, export, use and store designated nuclear substances under CNSC License Number: 01784-1-09.3.

As such, the SRC laboratory is closely monitored and inspected by the CNSC for compliance. SRC is an accredited testing laboratory assessed by the Standards Council of Canada under the requirements of ISO/IEC 17025:2005 (accredited laboratory number 537).

Safety is a paramount concern at the SRC laboratory. Low radioactive level samples are only processed at the main laboratory due to the generation of hazardous radioactive dust. Due to the limits set for radiation exposure, personnel working at the high radioactive level facility must limit their exposure. This may delay the immediate processing of high level samples at the facility.

In addition, the radioactivity exposure limits of laboratory personnel are also closely monitored by SRC. All personnel working with radioactive material are required to be registered as Nuclear Energy Workers and must wear the appropriate Personnel Protective Equipment at all times. Exposure to radioactivity is measured through the wearing of Thermo Luminescence Dosimeters . These are checked every three months by the CNSC. All readings are reported to the SRC Radiation Safety Officer. Any significant readings are reported to this individual.

13.3 Assaying

An aliquot of pulp was digested in a 100ml volumetric flask in a mixture of HNO_3:HCl, on a hot plate for approximately one hour, then diluted to volume using deionized water. Samples are diluted prior to analysis by ICP-OES. Instruments used in the analysis are calibrated using certified commercial solutions. The instruments used were PerkinElmer Optima 300DV, Optima 4300DV or Optima 5300DV. This method is ISO/IEC 17025:2005 accredited by the Standards Council of Canada.

13.4 Radiometric Surveying and Assaying

The majority of the grade data for the deposit have been calculated from the gamma probe results collected from inside the drill rods. These probes use a shielded detector that allows use of the probe in high-grade portions of the deposit. Typical commercial probes will become saturated at substantially lower grades than those observed at McArthur River, rendering the probe essentially inefficient. Grade of the mineralization is directly correlated to the gamma values that were collected with the probe.

Gamma probes are tested in a controlled source on a weekly basis to ensure that the readings they were producing were consistent. Any probe that shows unusual readings are sent off-site for testing and repair. Every time a probe is ready to be sent into a drill hole, it is again tested against a controlled source to ensure that the instrument is reading correctly.

Depending on the instrument, probe data is collected at either 10 cm or 20 cm intervals in the orebody. The data were downloaded into the database and verified. Two data checks are made that frequently involve adjustments to the data. The data is first compared to the geological log of the drill core. If discrepancies with the location of mineralization are found, probe data is adjusted (shifted) to match the geological log. The second check involves radon. Probe data from portions of holes that are known to be in unmineralized rock (based on the geological logging and SPP2 scans) often have a gamma signature that can be attributed to radon decay products in the groundwater filling the drillhole. This signature is often a relatively low but consistent counts per second value. An estimate of this radon gamma value is made, and that value is then stripped from the gamma data for the entire drill hole, including the mineralized zone.

Gamma data is then processed with software that accounts for the calibration (K) factor for the instrument, drill hole diameter, whether the hole is water filled or not, and the thickness of the steel in the drill rods that are probed through. The result is a file of corrected counts data. The corrected counts data are then used to calculate the grade in the samples using a proprietary counts/grade algorithm. The calculated grade data can then be plotted for interpretation and planning, and are ultimately used as the basis for the resource and reserve estimation.

At the beginning of the underground exploration program, several holes were selected and sampled for uranium analyses, in order to verify the results from the gamma processing. The holes that were selected had to have excellent core recovery so that the entire interval could be sampled. The sampling was again done with varying widths depending on the core and grade characteristics. Due to the high grades involved, the laboratory always requested an estimate of grade for each sample. The higher grade samples required extra titrations to prevent the analytical equipment from saturating. The analytical results were correlated with the equivalent grade results from the probing. Adjustments to the grade calculations could then be performed as required.

13.5 Density Determinations

Density at McArthur River is calculated using an equation based on the correlation of U_3O_8 grade to measured density. A total of 51 density determinations were made covering a grade range from 0.01% U_3O_8 to 77.9% U_3O_8. Values for grades greater than 77.9% are extrapolated. The data are summarized in Figure 16. Density was measured at Cameco s Key Lake laboratory (KL lab in Figure 16) and at McArthur River (MCA Lab in Figure 16), by Cameco s employees, as well as off site at the SRC laboratory. The Key Lake laboratory exhibits a small (0.1 g/cm^3), constant low bias relative to the McArthur River laboratory. That bias is not considered to be significant. The basic equation was derived in 1995. In 2000, the equation was modified to better fit high-grade data. The line of regression, labelled New 2000 in Figure 16 represents the equation used since that time.

Some samples have grades greater than 80% U_3O_8 and the densities for samples with those grades have not been verified. While there are no specific concerns about the validity of the equation, it is recommended that additional density data be collected to validate the high-grade portion of the equation and to generally validate the rest of the grade range.

Figure 16 Density Summary

13.6 Quality Assurance/Quality Control (QA/QC)

13.6.1 Exploration Surface Drilling

QAQC Materials Assay Analysis

SRC performs analyses in batches of 40, including 37 samples provided by the client, two internal standard materials, and a pulp duplicate of one of the client s samples.

For uranium assays SRC personnel, using the standards appropriate for each group, add Cameco standards to the sample groups. As well, for each assay group, an aliquot of Cameco s blank material is also included in the sample batch. **Table 13-1** summarizes the identity and number of materials analyzed in a typical batch of 40 samples.

Table 13-1: Materials Analyzed Within a Typical Assay Group

Material	**Number**
SRC Internal standards	2
SRC Analytical Duplicate	1
Cameco Standard	1
Cameco Blank	1
Cameco Unknowns	35
SRC Preparation Duplicate SR (U_3O_8 only)	1

Cameco employs a Data and Quality Assurance Coordinator (DQAC) who is responsible for reviewing the quality of geochemical data received from laboratory contractors. Electronic copies of all data are delivered to the DQAC for review from the laboratory, and additional hard and electronic copies are delivered to project staff and exploration management. Official use of analytical data is restricted until approved by the DQAC.

The DQAC reviews the analyses provided by the lab using the results of standard reference materials as a benchmark. Any data that is beyond the min/max threshold (within three standard deviations of the mean) established through round-robin analysis statistics would be considered outliers and would require further review and/or re-analysis. Generally, if the outlier is uranium, a re-assay will be done, but if the outlier is related to one of the other elements, a re-assay will only be done if the project geologist views that element as critical.

The DQAC also reviews the lab replicate samples for greater than a 20% relative percent difference from the associated reference sample. Any significant deviations are followed up with the project geologists to determine if a re-assay is required. Finally, the DQAC reviews the report sent from the lab to ensure that the format is appropriate for importing into the Century database.

Historic Quality Control material performance is periodically reviewed by the DQAC to monitor the historic consistency and accuracy of data received from the laboratory. The Century Systems database has an integrated QA/QC charting operation that will automatically produce basic comparisons of standards and blanks for quality control. Where required, more detailed review of Quality Control measures is completed using Access to plot results with respect to project and year.

13.6.2 Underground Drilling

QA/QC for underground drillhole information is focused on quality probing results. This is ensured by Cameco employee by checking the calibration of the probes prior to each use, by visually monitoring the radiometric measurements as they are read by the instrument going in and out of the hole and by duplicating probe runs on occasions. Additional quality control is obtained through comparisons of the probing results with the core measurements and by visual inspection of the radiometric profile of each hole by experienced geologists, at the mine site and in Saskatoon.

13.7 Sample Security

All samples are prepared under close supervision of a qualified geoscientist in a restricted core processing facility. They are stored and shipped under Transport of Dangerous Goods regulations through the Cameco warehouse facilities at McArthur River and in Saskatoon.

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

Sample preparation was done using industry accepted practices at the time the samples were prepared and is considered to be adequate.

Assaying was done with industry standard procedures.

Probe data was generated using industry standard procedures. Grades were calculated from corrected counts data using a proprietary algorithm. That algorithm was derived using assay data and is believed by Cameco to accurately reflect the U_3O_8 grade in the holes. While there are no specific concerns with the grade data, the confidence on the quality and representativeness of the probing results would be further supported by collecting duplicate data to determine the precision of the data. It is thus recommended that one in twenty holes be probed twice and the grades calculated. This will allow estimation of the precision of the method. It is also recommended that one in twenty holes be assayed and compared to the grade calculated from the probe data. This will further allow verification of the accuracy of the calibration of the probe.

Reconciliation of the model to production is indicates that grades estimated in the block model accurately reflect the mined grades. This further indicates that the grades calculated from probe data are adequate. The checks of the calibration of the probes prior to each use is also an important QA-QC check. This assures that the probes are operating properly. Duplicate probe runs and periodic assays will enhance confidence in data generated at McArthur River.

Sample security is largely defined by regulation and all samples were stored and shipped in compliance with regulations. Tampering with samples from McArthur River is extremely unlikely because of the high grades and the fact that core is scanned immediately after it is received at the sample preparation laboratory and a grade is estimated at that point.

14 DATA VERIFICATION

The drillhole database, containing information from surface and underground drill holes and used to produce the mineral resource and reserve estimates over the years, has been verified on multiple occasions by site geologists, external consultants and geologists within Cameco s Mineral Resources Management Department. The quality control measures and the data verification procedures included the following:

Surveyed drillhole collar coordinates and hole deviations were entered in the database, displayed in plan views and sections and visually compared to the planned location of the holes,

Core logging information was visually validated on plan views and sections and verified against photographs of the core or the core itself when questions were raised during the geological interpretation process,

Downhole radiometric probing results were compared with radioactivity measurements made on the core and drilling depth measurements,

The uranium grade based on radiometric probing was validated with sample assay results when available,

The information in the database is compared against the original data, namely paper logs, deviation survey films, assay certificates and original probing data files,

Since 2000, information collected from production activities, like freeze holes, raise bore pilot hole probing, radiometric scanning of scooptram buckets and mill feed sampling, are regularly compared to the drillhole data.

The qualified person for this section, Alain G. Mainville, has personally verified the data used for the estimates and supervised other geologists who have also verified the data. Mr. Mainville is satisfied with the quality of the data. Current and past mine production history has demonstrated that the drillhole data is valid.

15 ADJACENT PROPERTIES

Information on adjacent properties is not applicable to this technical report.

16 MINERAL PROCESSING AND METALLURGICAL TESTING

16.1 Overview

McArthur River ore is processed at two locations. Size reduction is conducted underground at McArthur River and the resulting finely ground ore is pumped to surface and transported to Key Lake operation as a 50% solids slurry at an average grade of 20% U_3O_8. The slurry is temporarily stored at McArthur River and trucked to Key Lake for processing. Blending to a nominal 4% U_3O_8 mill feed grade and all remaining uranium processing, tailings disposal, and effluent treatment steps occur at Key Lake.

The current CNSC licensed production rate for the combined McArthur River/Key Lake operations is limited to a maximum of 18.7 million pounds U_3O_8 annually. Cameco has applied for an increased licensed capacity of 22 million pounds U_3O_8 annually. Options to increase the production rate to at least 24 million pounds U_3O_8 annually are currently being assessed as part of a program to revitalize and expand the Key Lake operation.

The KLJV has entered into a toll milling agreement with AREVA for the processing of the portion of McArthur River ore that belongs to AREVA as the result of its participation in the MRJV. This toll milling agreement is described in Section 18.4.2 of this report. Since Cameco and UEM are the remaining participants in the MRJV and are owners of the Key Lake mill, no toll milling agreement is required for processing their share of McArthur River ore at the Key Lake mill.

A high level operation flow sheet of the project ore processing activities is shown in.

Figure 17 McArthur River Ore Processing Activities Block Flow Sheet

16.2 Processing at McArthur River

Initial processing of the ore produced by the raise boring mining system takes place underground including grinding, density control and water handling circuits. The finely ground, high density ore slurry is pumped to surface storage tanks, blended, thickened, and loaded into truck mounted containers for delivery to Key Lake at grades ranging from 15 to 30% U_3O_8. Contaminated water from underground, after recycling to the maximum extent possible, is treated on surface in a two stage treatment plant and the excess, above the demand for recycled treated water, is released to the environment.

16.2.1 Metallurgical Testwork

Ore processing at McArthur River was commissioned in 2000 following a lengthy period of testing, design, procurement, and construction. The flowsheet was largely based on the use of conventional mineral processing concepts and equipment. Where necessary, testwork was undertaken to prove design concepts or adapt conventional equipment for unique services. Simulated ore was utilised in much of the testwork because the off-site testing facilities were not licensed to receive radioactive materials. The major test programs undertaken included:

- Pipeline flow testing of simulated uranium ore slurries at SRC s Saskatoon pump test facility to establish minimum flow velocities and maximum particle sizes.

- Operational testing on a full scale slurry container prototype at Key Lake including gravity unloading, time for contents to freeze while outside during cold weather and drop testing to evaluate the potential for leakage during a simulated road accident.

- Operational testing using simulated uranium ore slurries with prototype container loading and vacuum unloading platforms at the Saskatoon shops of Prairie Machine and the Northstar Business Center.

- Full scale testing of truck/trailer combinations to assess B-train handling and weight bearing characteristics related to ore slurry transportation in containers.

- Radiation scanning equipment testing on a full scale slurry container prototype at Key Lake. Although this testwork was successful, automated scanning equipment was not installed at Key Lake or McArthur River. Instead the use of closed circuit television cameras and manual scanning was implemented.

Marconajet testing on simulated crushed uranium ore at Pre-Con Limited s (Pre-Con) Saskatoon shop to investigate the reclaiming of settled crushed ore from the bottom of storage tanks.

MMD Sizer testing on simulated uranium ore at Pre-Con s Saskatoon shop to investigate the use of low profile crushing equipment. This testwork was unsuccessful and an MMD Sizer was not included in the flowsheet.

Testing of a Water Flush Cone Crusher at Pre-Con s Saskatoon shop on simulated uranium ore to investigate the use of crushing equipment as part of the grinding circuit. Although this testwork was successful, a cone crusher has not been found to be necessary in the semi-autogenous grinding circuit.

Testing of a prototype Transportable Mining Unit on simulated uranium ore at Pre-Con s Saskatoon shop and later, underground at McArthur River to assess methods for recovering, screening, and pumping reamed ore. Although included in the original flowsheet, this equipment is no longer utilised at McArthur River. Instead reamed ore is hauled to the grinding circuit by underground load-haul-dump (LHD) vehicles.

Testing at Key Lake of equipment to simultaneously measure slurry density and ore grade.

Lab scale Bond Grinding Work Index tests on representative ore samples for SAG mill sizing purposes.

Lab scale settling and thickening tests on representative ore samples at the target grind for thickener sizing purposes.

Since commissioning, numerous changes have been made to the McArthur River ore processing and water treatment circuits to improve their operational reliability and efficiency. From a uranium recovery perspective, the most important was to change the grinding circuit classification system from screens to cyclones. Classification based on specific gravity and particle size instead of particle size alone resulted in preferential grinding of the denser uranium minerals versus the gangue, providing a measurable recovery increase in the Key Lake leach circuit. In addition, this change reduced particle segregation issues during ore slurry transport and storage, significantly reducing plugging and sanding out problems in pipelines and tankage at both McArthur River and Key Lake.

16.2.2 Current McArthur River Flowsheet

Mined ore in the form of raise bore cuttings is either fed directly to the underground grinding circuit or stockpiled. The ore is transferred by LHD to a grizzly covered hopper. A rock breaker mounted over the hopper is used to reduce oversize until it passes through the grizzly screen. Grizzly undersize is fed by belt conveyor to a semi-autogenous grinding (SAG) mill located on the 640 m level. The grinding circuit operates at 15 t/h in closed circuit with cyclones and a scalping (safety) screen. Secondary feed sources such as settled solids from raises and sumps, and drill cuttings are pumped to two underground overflow type surge tanks and intermittently re-slurried for transfer to the grinding circuit by bottom mounted solids recovery Marconajet systems.

Cyclone overflow ground to a P_{80} of 100 microns is thickened to 50% solids in one of two 13 m diameter thickeners and pumped to an underground ore slurry storage tank. From there, the ore slurry is pumped via boreholes to four air agitated 650 m^3 pachuca storage tanks located on surface. Ore slurry discharged from the pachucas is blended to a maximum grade of 30% U_3O_8 in a mix tank. After excess water is removed from the ore slurry in a thickener, it is pumped into 5 m^3 truck mounted containers for shipment by road to Key Lake. Each truck train carries four containers. Typically 12 to 14 truck loads are required daily to meet current production rates.

As much untreated water as possible is recirculated underground in the process. Excess water is pumped to surface and treated in a conventional 750 m^3/h, two stage water treatment plant. Additional water treatment capacity is available as required in a 750 m^3/h contingency water treatment plant. Treated water is recycled as much as possible and only the excess is released to the environment via a monitoring pond system. Precipitated solids from the water treatment process are either added into the ore slurry or filtered and mixed with mineralized mine waste. Mine waste including filtered precipitates are hauled by truck to Key Lake where they are stockpiled and used as part of the blending strategy to achieve the target mill feed grade.

16.3 Processing at Key Lake

Processing at Key Lake was initiated in 1983 on ores averaging 2% to 3% U_3O_8 mined initially from the Gaertner open pit and later from the adjacent Deilmann open pit. Annual uranium production was initially 12 million pounds U_3O_8 with mill ore throughput constrained to approximately 1,000 dry metric tonnes per day. Throughput was later increased to 14 million pounds U_3O_8 annually by minor debottlenecking and reducing the length of planned maintenance shutdowns. Mill tailings were initially disposed of in a purpose built above ground tailings management facility. Mining was completed at Key Lake in 1997 and the mined out Deilmann pit was converted to an in-pit below ground tailings disposal facility.

In 2000, McArthur River ore slurry receiving and blending facilities were commissioned at Key Lake. McArthur River ore slurry is removed by vacuum from the truck mounted containers and the high grade slurry is blended to 4% U_3O_8 for radiation protection purposes, using mineralized waste processed through the original Key Lake grinding plant. The blended slurry is pumped to the original Key Lake mill where the uranium is recovered as a calcined yellowcake grading 98% U_3O_8 on average. The current licensed maximum annual production rate of 18.7 million pounds U_3O_8 was achieved largely by debottlenecking the product end of the existing plant with minimal additional capital investment required. Cameco has submitted an application to the CNSC to raise the licensed production capacity to 22 million pounds U_3O_8 annually by further debottlenecking. Cameco believes the successful commissioning of facilities currently under construction in the bulk neutralization plant to control selenium and molybdenum concentrations in the final treated effluent will be helpful in Cameco s efforts to receive regulatory approval.

Three stockpiles contain non-mineralized waste rock and two contain low-grade mineralized material. The latter are currently used to lower the grade of McArthur River ore to approximately 4% U_3O_8 before entering the milling circuit. The dilution of the high-grade ore serves three purposes: recovery of uranium from the low-grade material, reduction of radiation exposures in the mill, and final disposal of the low- grade waste. The remaining non-mineralized waste rock stockpiles will require decommissioning upon site closure.

16.3.1 Metallurgical Testwork

An extensive program of bench scale testwork was completed at the Key Lake metallurgical lab on representative samples of fresh McArthur River ore in the years prior to the introduction of this material into the Key Lake mill in early 2000. This testwork confirmed the suitability of the Key Lake mill circuits for processing McArthur River ore with high uranium recovery. In 2008, overall uranium recovery to the final calcined yellowcake product averaged 98.3%.

Concrete accompanying the ore and waste from McArthur River originates in raises mined adjacent to cemented back-filled raises. This material is referred to as McArthur mineralized waste and is one of the components used to blend down the feed grade of the slurry to 4% U_3O_8 before the mill leaching process. This has contributed to processing problems in the Key Lake solvent extraction circuit with excessive crud formation and resultant high organic losses, leading to difficulties producing releasable effluent at times from the Key Lake water treatment system. Testwork has confirmed that the fly ash component in the backfill has exacerbated these problems, resulting in a change back to 100% Portland cement usage for backfill preparation at McArthur River. Recent testwork at Key Lake has shown that gravity separation techniques can be used to remove concrete particles from the McArthur River mineralized waste before it is added to the mill feed blend. A capital project at Key Lake involving the installation of a centrifugal gravity concentrator is complete and optimization is in progress.

16.3.2 Current Key Lake Process

The Key Lake milling and water treatment facilities are located in eight separate plants. The McArthur River ore slurry receiving plant, the grinding/blending plant, and the reverse osmosis plant are located adjacent to each other, between the two open pits approximately two kilometres away from the mill site. The remaining facilities are located on the mill terrace and include the following:

- leaching/counter current decantation plant,
- solvent extraction plant,
- yellowcake precipitation/dewatering/calcining/packing/ammonium sulphate crystallization plant,
- bulk neutralization/lime handling/tailings pumping/oxygen plant,
- and the powerhouse/utilities/acid plant complex.

The plants located on the terrace are interconnected by covered walkways or galleries.

Each of the plants is operated from a control room typically staffed by an operator and one or two helpers. The mill terrace is paved to contain any spillage and shaped to direct any liquid to a reservoir for subsequent treatment. Process pipelines between the ore receiving/grinding/blending plants, the main mill site and the tailings disposal areas are contained in sealed concrete utilidors. In order to avoid spills to the environment, alarmed collection sumps have been provided every 100 m to warn of possible pipeline breaks.

High grade McArthur River ore slurry arriving at the Key Lake receiving plant is unloaded from the truck mounted containers by a vacuum system and pumped to one of four large air agitated slurry storage pachuca tanks. Periodically high grade slurry is pumped from a pachuca to the blending tank located in the grinding plant. There it is mixed with low grade slurry prepared by grinding mineralized waste hauled from McArthur River or left over from the original Key Lake mining operations. The resulting slurry, blended to a target of 4% U_3O_8, is pumped to one of three storage pachuca tanks located in the leach plant. Blending is necessary because the original Key Lake processing facilities were not designed, from a radiation protection perspective, to accommodate the high ore grades found at McArthur River.

Sulphuric acid produced on site by burning/converting sulphur is used to dissolve the uranium, along with various impurities, from the ore in a two stage leach circuit. The first stage occurs at atmospheric pressure in pachuca tanks while the second stage occurs in autoclaves under 540 kPa pressure at 60º C. Nearly pure oxygen, produced on-site in a cryogenic air separation plant, is injected into the leach vessels to oxidize the uranium minerals and thereby permit uranium dissolution. Approximately 99% of the uranium and varying percentages of the impurities enter solution during leaching.

Counter current decantation (CCD) consists of eight thickeners and a clarifier located outdoors on the mill terrace beside the leach plant. Acidic water is introduced at the tail end of the circuit and advanced from thickener to thickener in the opposite direction to the leached solids flow. The result is that the dissolved components are washed away from the leached solids. The washed leach residue is sent to the bulk neutralization plant for neutralization and disposal. Pregnant solution containing 10 to 15 g/L dissolved uranium and varying levels of impurities is clarified to remove residual solids and pumped through sand filters to the solvent extraction plant.

In the solvent extraction plant, filtered pregnant solution is mixed with an organic solvent consisting of isodecanol and amine dissolved in kerosene. The uranium transfers from the aqueous solution to the organic phase leaving behind most of the dissolved impurities. Th