Cameco

McArthur River Operation

Northern Saskatchewan, Canada

National Instrument 43-101

Technical Report

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Prepared for:
Cameco Corporation

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TABLE OF CONTENTS

TABLES

FIGURES

Units of Measure and Abbreviations

%	percent
°	degrees
°C	degrees Celsius
Cdn$	Canadian dollars
Cdn$ M	million Canadian dollars
cfm	cubic feet per minute
cm	centimetres
cps	counts per second
e%U_3O_8	equivalent percent uranium oxide
g	grams
g/cm^3	grams per cubic centimetre
GHM	ground hazards model
h	hour(s)
ha	hectares (10,000 square metres)
HP	horsepower
IRR	internal rate of return
km	kilometres
km/h	kilometres per hour
km^2	square kilometres
kV	kilovolts
lbs	pounds
M	million
MVA	megavolt ampere
MWA	megawatt ampere
m	metres
m^3	cubic metres
m^3/h	cubic metres per hour
masl	metres above sea level (elevation)
mm	millimetres
Mo	molybdenum
MPa	megapascal
MVA	megavolt ampere
MW	megawatts
NPV	net present value
psi	pounds per square inch
P_{80}	80% passing (particle size nomenclature)
RMR	rock mass rating
SX	solvent extraction
t	tonnes (metric)
t/h	tonnes per hour
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)
US$	US dollars
US$/lb	US dollars per pound
>	greater than
<	less than

1 SUMMARY

1.1 Preamble

In February of 2009, Cameco Corporation (Cameco) prepared and filed a technical report for the McArthur River Operation based on scientific and technical information available at that time (2009 Technical Report). Since the 2009 Technical Report, there have been further advancements and changes in the McArthur River Operation. The McArthur River Operation has experienced world record uranium production over the past two years.

This technical report is based on the scientific and technical information as of August 31, 2012. Some of the key highlights include:

- Cameco has completed updated Mineral Reserve and Mineral Resource estimates. Cameco's share of the Mineral Reserves increased from 226.2 Mlbs U_3O_8 as of December 31, 2011 to 269.1 Mlbs U_3O_8 as of August 31, 2012 (up by 19.0%), due to a 22.1% increase in tonnage and only a slight decrease in the average grade. The changes to the Mineral Reserve estimates are primarily due to the addition of 41.2 Mlbs U_3O_8 of Probable Reserves (Cameco's share) from Zone B as well as 14.2 Mlbs U_3O_8 of Probable Reserves (Cameco's share) from the incorporation and upgrading of Mineral Resources for an area formerly part of McA South into Zone 4 South. See Sections 14 and 15 for more details.

- The McArthur River production schedule has been modified to incorporate the additional Mineral Reserves and to include a production rate increase to 22.0 Mlbs U_3O_8 per year that is scheduled for 2018, subject to receipt of regulatory approval. The updated production schedule assumes the current average licence limit of 18.7 Mlbs U_3O_8 per year until 2017. Between 2018 and 2026, an average annual production of 21.5 Mlbs U_3O_8 is forecast. Estimated production then begins to decrease in three distinct steps towards the end of the mine life in 2034. Based on the planned production schedule, Cameco estimates that McArthur River will have a mine life of at least 22 years. See Section 16.5 and Figure 16-12 for more details.

- Cameco's share of the total estimated life of mine capital costs for the McArthur River and Key Lake Operations is \$2.5 billion compared to \$1.4 billion in the 2009 Technical Report. More than 40% of this increase is related to the addition of more than 85 Mlbs U_3O_8 of new forecast production since the 2009 Technical Report and about 15% relates to expenditures required to allow production at a higher rate such as additional ventilation including the sinking of a fourth ventilation shaft. The remainder of the increase is related to expanding the infrastructure to support ongoing and expanded operations and general cost escalation. In 2013, Cameco's share of the estimated capital costs is \$235 million. See Sections 18 and 21.1 and Table 21-1 and Table 22-1 for more details.

- The operating costs per pound are estimated to average \$19.23/lb U_3O_8 over the life of the mine. This is a slight decrease since 2009, but it is considered to be significant given the general trend of escalating costs widespread across the mining industry, particularly in the areas of labour, energy and consumables. See Section 21.2 and Table 21-2 for more details.

- The economic analysis results in an estimated pre-tax net present value (NPV) at a discount rate of 8% to Cameco of \$3.0 billion for its share of Mineral Reserves. Using the initial investment and operating cash flows from inception, the pre-tax internal rate of return (IRR) is estimated to be 11.9%. See Section 22.1 and Table 22-1 for more details.

1.2 Introduction

McArthur River is an underground uranium mine located in northern Saskatchewan. It contains the world's largest known high grade uranium deposit and as at August 31, 2012 has produced approximately 225 Mlbs U_3O_8 since the start of production in 1999. Cameco is the operator. McArthur River is owned by the McArthur River Joint Venture (MRJV). The MRJV partners are:

- Cameco (69.805%); and

- AREVA Resources Canada Inc. (AREVA) (30.195%).

This technical report has been prepared for Cameco by, or under the supervision of, internal qualified persons in support of disclosure of new scientific and technical information relating to the McArthur River Operation, including Cameco's new Mineral Resource and Mineral Reserve estimates. This information is included in Cameco's management's discussion and analysis for the nine months ended September 30, 2012 and the corresponding press release.

1.3 Location and Site Description

The McArthur River mine site 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 km^2, not including the nearby airstrip and camp facilities. The McArthur River mine site contains all the necessary services and facilities to operate a remote underground mine. Site facilities include a 1.6 km long gravel airstrip and air terminal, permanent residence and recreation complex, administration and maintenance shops building, warehouse, water containment ponds and treatment plant, freeze plant, concrete batch plant, one full service shaft and two ventilation shafts, site roads, powerhouse, electrical substations, ore slurry load out facility, freshwater pump house and miscellaneous infrastructure.

The means of access to the McArthur River property is by an all-weather road and by air. Supplies are transported to the site by truck year round and can be shipped from anywhere in North America through the company transit warehouse in Saskatoon. An 80 km all weather gravel road runs between the mine site and the Key Lake Operation. U_3O_8 is shipped from the Key Lake Operation by truck year round to Saskatoon and elsewhere. An unpaved airstrip and terminal are located approximately one km east of the mine site within the surface lease, allowing flights to and from the McArthur River property.

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 McArthur River mine site receives its electrical power from the provincial grid via the I2P line. The current Saskatchewan Power service contract is for 15 MVA supply. The site currently has 14.3 MW of back-up generation which is sufficient to maintain operations during power interruptions.

Personnel are recruited on a preferential basis: initially from the communities of northern Saskatchewan, followed by the province of Saskatchewan and then outside the province. 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 sufficient surface rights to meet all of its current mining operation needs. No tailings management facilities are required as McArthur River mineralization is sent to the Key Lake mill for processing.

1.4 Property Tenure

The mineral property consists of one mineral lease, totalling 1,380 hectares (Mineral Lease or ML-5516), and 21 mineral claims (Mineral Claims), totalling 83,438 hectares. ML-5516, which hosts the McArthur River deposit, sits on the northwestern edge of the Mineral Claims. 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. Based on previous work submitted and approved by the Province of Saskatchewan, title to the Mineral Claims is secured until 2018 or greater.

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 November 2010 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 1,425 hectares.

1.5 Geology and Mineralization

The McArthur River deposit is located in the southeastern portion of the Athabasca Basin, within the southwest 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 consist of the A, B, C and D units of the Manitou Falls Formation, and a basal conglomerate containing pebbles and cobbles of quartzite. 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 640 m below surface. Underground drilling programs have covered approximately 950 m of the 1,700 m strike length delineated from surface. Recent surface exploration has indicated that the strike length of the mineralization could increase to 2,700 m, after encouraging results have been obtained both north and south of the current mine extents. Mineralized 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. The main part of the mineralization, generally at the upper part of the basement wedge, averages 12.7 m in width and attains a maximum width of 28 m (Zone 2). The vertical extent of the mineralization ranges from 50 m to 120 m.

Nine distinct mineralized areas have been identified at the McArthur River deposit. Five of these have been well defined with underground drilling, namely Zones 1, 2, 3, 4 and 4 South. The remaining four, McA North (1), McA North (2), Zone A and Zone B, are based entirely on surface drilling. McA North (1) has recently experienced underground drilling (results pending). Underground drilling was recently started on Zone A and is ongoing.

Two under-explored mineralized showings, known as McA North (3) and McA South, as well as other mineralized occurrences, will be followed up on if warranted.

The data derived from diamond drillholes have been interpreted to yield estimates of Mineral Resources for the McArthur River deposit. In addition to this drilling, hundreds of freezeholes and raisebore pilot holes have provided additional data supporting the interpretations. A portion of these freezeholes were utilized in the Zone 1 Mineral Resource and Reserve estimate.

With the exception of Zone 2, the mineralization occurs in both the sandstone and basement rock along the faulted edge of the basement wedge.

The P2 thrust fault, also known as the P2 structure, 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 120 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.

1.6 Mineral Resources and Mineral Reserves

The Mineral Resource and Mineral Reserve estimates are based on approximately 50 mineralized drillholes from surface, 650 mineralized drillholes from underground and 20 mineralized freezeholes.

A summary of the estimated Mineral Resources for McArthur River deposit with an effective date of August 31, 2012 is shown in Table 1-1. Alain G. Mainville, P.Geo., of Cameco, is the qualified person within the meaning of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) for the purpose of the Mineral Resource estimates.

Table 1-1: Summary of Mineral Resources – August 31, 2012

Category	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Measured	68.6	5.53	8.4	5.8
Indicated	15.5	9.97	3.4	2.4
Total Measured and Indicated	**84.1**	**6.35**	**11.8**	**8.2**
Inferred	325.0	7.86	56.3	39.3

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add due to rounding.
(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 legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.
(4) Mineral Resources have been estimated at a minimum mineralization thickness of 1.0 m and a minimum grade of 0.1% to 0.5% U_3O_8 assuming extraction by underground mining methods.
(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 using cross-sectional method and 3-dimensional block models.
(8) No known metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues are expected to materially affect the above estimates of Mineral Resources.
(9) Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

A summary of the estimated Mineral Reserves with an effective date of August 31, 2012 is shown in Table 1-2. Alain G. Mainville, P.Geo., Gregory M. Murdock, P.Eng. and Leslie D. Yesnik, P.Eng., of Cameco are the qualified persons within the meaning of NI 43-101 for the purpose of the Mineral Reserve estimates.

Table 1-2: Summary of Mineral Reserves – August 31, 2012

Category	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Proven	384.4	23.81	201.8	140.8
Probable	677.8	12.30	183.7	128.3
Total Reserves	**1,062.2**	**16.46**	**385.5**	**269.1**

Notes:
(1) Total Mlbs U_3O_8 are those contained in Mineral Reserves and are not adjusted for the estimated mill recovery of 98.7%. Totals may not add up due to rounding.
(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 0.77% 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 and mineralized waste mined.
(6) Mineral Reserves have been estimated based on 97.5% mining recovery.
(7) Mineral Reserves were estimated based on the use of the raisebore, boxhole and blasthole stope mining methods combined with freeze curtains.
(8) Mineral Reserves were estimated using a 3-dimensional block model.
(9) An average uranium price of US\$61/lb U_3O_8 with a US\$1.00 = Cdn\$1.00 fixed exchange rate was used to estimate Mineral Reserves. The Mineral Reserves are not significantly sensitive to variances in the uranium price of plus or minus \$20 provided that annual production remains above 10 Mlbs U_3O_8. The price assumption is based on independent industry and analyst estimates of spot prices and the corresponding long-term prices and reflects Cameco's committed and uncommitted sales volumes. For committed sales volumes, the spot and term price assumptions were applied in accordance with the terms of the agreements. For uncommitted sales volumes the same price assumptions were applied using a spot-to-term price ratio of 60:40.
(10) No known metallurgical, environmental, permitting, legal, title, taxation, socio-economic, political, marketing or other issues are expected to materially affect the above estimates of Mineral Reserves.

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 on average 5% of the Mineral Reserve estimates of contained pounds of uranium.

1.7 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.

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 640 m 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. Approvals for mine construction and development were obtained in 1997. 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 910 underground drillholes, totalling in excess of 82,000 m, have provided detailed information for delineation of 950 m of the strike length. Over 2,275 additional underground diamond drillholes, totalling 143,000 m, were drilled for geotechnical information, probe and grout covers, service and drain holes and freezeholes.

Underground exploration drilling and development continues in 2012. Activity for 2012 focuses on expanding the underground development on both the 530 m and the 640 m levels, northeasterly towards Zone B. Underground exploration drilling into Zone A commenced in mid-2012. An exploration drift is also moving southwesterly on the 530 m level.

As at August 31, 2012, 153 surface drillholes totalling in excess of 91,000 m, comprising a combination of conventional and directional diamond drilling, have tested the P2 structure at approximately 200 m intervals for a distance of 4.3 km northeast and 6.4 km southwest of the mine, respectively. Results continue to be encouraging with a number of segments of the P2 structure identified for further follow-up drilling.

1.8 Mining Methods

The McArthur River deposit presents unique challenges that are not typical of traditional hard or soft rock mines. These challenges are the result of mining in or near high pressure radon bearing ground water in challenging ground conditions with significant radiation hazards due to the high grade uranium ore. As such, mine designs and methods are selected on their ability to mitigate hydrological, radiological and geotechnical risks.

All the mineralized areas discovered to date at McArthur River are in or partially in water bearing ground with pressures ranging from 680 to 850 psi. This high pressure water source is isolated from active development and production areas in order to reduce the inherent risk of an inflow. To date, McArthur River has relied on pressure grouting and ground freezing to successfully mitigate the risks of the high pressure ground water.

Gamma, radon, radon progeny and long-lived radioactive dust (LLRD) hazards are all present at McArthur River. Controls must be in place in order to ensure regulatory compliance is maintained. Typical controls used at McArthur River include avoiding development in ore whenever possible and practical, shielding of gamma sources, direct exhaust ventilation in dust or radon source areas, negative ventilation and duct containment of radon gas sources, remote technology whenever possible and practical and ground freezing and pressure grouting to prevent entry of radon bearing water.

Stable openings must be maintained at McArthur River for both the safety of the underground workers and to prevent ground failures that may lead to an uncontrolled water inflow. Typical techniques employed at McArthur River include limiting the size of openings, conservative support design, installation of ground support in a timely manner, tight filling of mined out areas and the use of road headers and raisebores to avoid blast damaged ground.

The raisebore mining method is the primary ore extraction method at McArthur River and has been in use since 1999. It is currently the only approved mining method at McArthur River. It allows drill and extraction accesses to be driven in waste over 120 m apart. Waste and ore can be easily separated by scanning and the raise opening created in the weak rock mass has proven to be very stable. Ore recoveries are typically 97.5%. The method has proven to be very successful in achieving budgeted production, a low accident frequency and low radiation exposures.

Cameco is also in the process of testing two other mining methods, boxhole boring and drill and blasthole stoping. Boxhole and drill and blast mining are currently approved for testing only. Upon successful completion of these test programs, an application will be made to the Canadian Nuclear Safety Commission (CNSC) to approve both boxhole and drill and blasthole mining as extraction methods for McArthur River. Testing of these two methods is scheduled to be completed in late 2013.

Boxhole boring is a vertical development technique used at a few mines in the world; however, its use at McArthur River represented its first application to uranium mining as a production method. Boxhole mining is expected to be suitable for areas where it is not feasible or practical to establish access above the ore zone. These areas would typically be small high grade ore areas with a short strike length. Test mining has thus far identified this as a viable mining option; however, only a minor amount of ore is scheduled to be extracted using this method as more efficient methods are also viable.

Blasthole stoping has been used extensively in the mining industry including uranium mining. This method is currently being tested and is planned in areas where blast holes can be accurately drilled and small stable stopes excavated without jeopardizing the freeze wall integrity. This method is expected to compliment the raisebore mining method and allow more economic recovery of the ore fringe areas as well as the smaller lower grade areas.

1.9 Mine Operations

The active mine areas currently include Zone 2 and Zone 4 Central Lower. Zone 2 has been active since 1999 utilizing the raisebore mining method. The area is isolated by a freeze wall that was expanded in 3 stages, Panels 1-2, Panel 3 and Panel 5. As the freeze wall was expanded, the inner connecting freeze walls were decommissioned in order to recover the ore originally isolated by active freeze holes. Mining is near completion in Panels 1-3 and the majority of the remaining Zone 2 Proven Reserves are in Panel 5.

Mining began in Zone 4 Central Lower in December 2010. Raisebore mining is currently being used with drill and blast stoping planned for remnant cleanup at the eastern fringe of the orebody. As Zone 4 is expanded, the current freeze wall will become obsolete and be decommissioned in order to increase ore recoveries similar to the Zone 2 mine area.

Zone 4 North will be the next active mine area to come on-line. It is currently under development and is forecasted to be in production in 2014. Freeze drift development has been completed and freeze drilling was approximately 45% complete as of August 31, 2012. Initial production will come from the lower mining area while the ramp access to the upper mining area is established under freeze coverage. Raisebore mining is planned for this mine area.

After Zone 4 North, McArthur River will continue to transition into new mine areas as outlined in Section 16.5 in order to successfully meet the planned production in the life of mine schedule. To support these mining transitions, critical support infrastructure must also be expanded. Critical support infrastructure that must be expanded includes freeze, electrical, ventilation and water treatment. Ventilation work includes the sinking of a fourth shaft, which is expected be completed in 2017.

1.10 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 purpose-built containers to Key Lake as a 50% solids slurry at an average grade of 15% 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 98.7% U_3O_8 on average.

The Key Lake mill is owned by the Key Lake Joint Venture (KLJV) and operated by Cameco. The KLJV partners are:

- Cameco (83 1/3%); and
- AREVA (16 2/3%).

The KLJV has entered into a toll milling agreement with AREVA for the processing of AREVA's share of McArthur River Mineral Reserves at the Key Lake mill. See Section 19.2.2 for a discussion of this toll milling agreement. Cameco's share of McArthur River Mineral Reserves is also milled at Key Lake, but Cameco does not have a formal toll milling agreement with the KLJV.

The Key Lake mill can produce up to 20.4 Mlbs U_3O_8 (7,850 t U) per year while McArthur River can produce up to 21 Mlbs U_3O_8 (8,100 t U) per year, as long as in each case, average annual production does not exceed 18.7 Mlbs U_3O_8. This flexibility is currently limited by safety and environmental performance and if there is a shortfall to be recouped. Options being explored to increase the licensed capacity for the McArthur River mine and Key Lake mill are discussed in Sections 1.11 and 20.3.

In late 2006, Cameco initiated a strategic plan to revitalize the Key Lake facilities in order to ensure that the mill would be able to process McArthur River's Mineral Reserves for the next thirty years. 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 25 Mlbs U_3O_8 per year. A number of the infrastructure upgrades have been completed including upgrading of circuits and the replacement of the acid, steam and oxygen plants. The balance of the Key Lake revitalization plan infrastructure improvements are expected to be complete by 2016.

1.11 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 these operations are: the CNSC (federal), the Mine Safety Unit of Saskatchewan, Ministry of Labour Relations and Workplace Safety (provincial) and the Ministry of Environment (SMOE) (provincial). Other agencies that have an interest with respect to environmental monitoring programs and activities that may impact water ways are Environment Canada (federal) and the Department of Fisheries and Oceans Canada (federal).

There are three key permits that must be maintained to operate the mine. Cameco holds a "Uranium Mine Facility Operating Licence" from the CNSC, an "Approval to Operate Pollutant Control Facilities" from the SMOE and a "Water Rights Licence and Approval to Operate Works" from the Saskatchewan Watershed Authority. These permits are current. The CNSC operating licence was renewed for 5 year term in 2008 and expires on October 31, 2013. The SMOE Approval to Operate Pollutant Control Facilities was renewed in 2009 and expires on October 31, 2014. The Saskatchewan Watershed Authority permit was obtained in 1993 and was last amended in November 2011. It is valid for an undefined term.

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. There are two key permits that 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" from the 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 renewal process for this licence will be started at the end of 2012. The SMOE approval expires on November 30, 2014.

The CNSC operating licences for McArthur River and Key Lake limit production to approximately 18.7 Mlbs U_3O_8 (7,200 t U) 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 mining activities.

In 2009 and subsequently in 2010, the CNSC amended the operating licence for first the Key Lake mill and then the McArthur River mine, to allow Cameco flexibility in annual licensed production. These amendments allow not only for improved operational management and reliability by avoiding unnecessary plant shutdowns in winter conditions if the nominal annual production has been achieved prior to year end, but also the recovery of previous production shortfalls. This flexibility is currently limited by safety and environmental performance and if there is a shortfall to be recouped.

In 2002, Cameco applied to increase the annual licensed production capacity at both the McArthur River mine and the Key Lake mill to 22 Mlbs U_3O_8 per year compared to the then current annual licensed production capacity of 18.7 Mlbs U_3O_8. While this application did receive ministerial approval from the Province, a screening level environmental assessment (EA) under the *Canadian Environmental Assessment Act* (CEAA) with the CNSC as the responsible authority was required. The EA was delayed due to discussions with the CNSC regarding how to address local accumulation of molybdenum and trace amounts of selenium in the Key Lake mill downstream environment. The result was that the 22 Mlbs EA was suspended indefinitely. Cameco modified the water treatment process at the Key Lake mill, which the regulatory agencies have since accepted.

Concurrently with the improvements to the water treatment process at the Key Lake mill, Cameco initiated a separate EA for the Key Lake mill to extend the operational life of the Key Lake mill and establish it as a regional mill, by increasing the tailings capacity and nominal annual production rate to 25 Mlbs U_3O_8. As the Key Lake EA was designated by the SMOE, the changes realized through the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) will have no effect to the current process the Key Lake EA is following.

In April 2012, Cameco submitted a draft environmental impact statement (EIS) for the Key Lake extension project to the regulators and comments have been received. Work is underway to provide responses to these comments and submission of the final EIS is planned for 2013.

Subsequently in 2012, with the implementation of CEAA 2012, Cameco was notified by the CNSC that the EA for the proposed increase in production at McArthur River to 22 Mlbs U_3O_8 per year would be transitioned to the CNSC licensing and compliance processes under the authority of the *Nuclear Safety and Control Act* (NSCA) rather than the federal EA process. Cameco is developing plans to complete the regulatory process for this production increase at McArthur River.

1.12 Key Lake Tailings Management

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

In February of 2009, Cameco received regulatory approval to deposit tailings to a moderately higher elevation in the Deilmann TMF. At current production rates, the approved capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018.

In 2008, 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 additional capacity to allow for other potential sources of production in the region. This tailings option study considered the feasibility of further extending the capacity of the Deilmann TMF and options for new tailings management facilities. In 2012, Cameco submitted a draft EIS for the Key Lake extension project, which if approved through the joint Provincial and CNSC EA process, will secure 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. Controlling the water level is an effective interim measure in managing further sloughing while work to cut back the slopes for long term stabilization is completed. Cameco has doubled its dewatering treatment capacity, allowing it to reduce the water level in the pit. Following extensive engineering, design and regulatory review, the Deilmann TMF long-term stabilization project was initiated in 2011 with the relocation of surface infrastructure necessary to allow the flattening of the slope of the pitwalls. Currently, Cameco is in the process of cutting back the west wall slope to achieve a flatter, more stable slope for long term tailings management.

At the Key Lake site there is another tailings management facility. 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.

1.13 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 2034. Annual production is currently limited by McArthur's Uranium operating licence described above.

The production schedule assumes the current average licence limit of 18.7 Mlbs U_3O_8 per year until 2017. A planned production rate increase to 22.0 Mlbs U_3O_8 per year is scheduled in 2018, subject to receipt of regulatory approval. Between 2018 and 2026, average annual production of 21.5 Mlbs U_3O_8 is forecast. Estimated production then begins to decrease in three distinct steps towards the end of the mine life in 2034 (See Section 16.5 and Figure 16-12).

Mill production at Key Lake will closely follow mine production for the life of mine. Differences in a given production year between mine and mill production will occur due to the addition of mineralized material stockpiled at Key Lake, year to year inventory changes and recovery rate (See Section 16.5 and Figure 16-12).

1.14 Economic Analysis

The economic analysis for the McArthur River mine is based on the current mine plan and Cameco's share (69.805%) of the estimated Mineral Reserves. The analysis does not contain any estimating involving the potential mining and milling of the Mineral Resources. Accordingly, expenditures that may be required to bring any of the Mineral Resources into production have not been included. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

The economic analysis resulted in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, as at August 31, 2012, of $3.0 billion for its share of the McArthur River Mineral Reserves. Using the initial investment and operating cash flows from inception, the pre-tax IRR has been estimated to be 11.9%.

Operating costs for the MRJV are estimated to average $19.23/lb U_3O_8 over the life of the Mineral Reserves only. For the period from 2012 to 2016, operating costs are estimated to average $17.31/lb U_3O_8. The operating projections are stated in constant 2012 dollars and assume the production schedule described above in Section 1.13 and in more detail in Section 16.5. Based on the planned production schedule, Cameco estimates that McArthur River will have a mine life of at least 22 years. Operating costs include estimated underground mining operations and milling costs.

Cameco's share of the total estimated life of mine capital costs for the McArthur River and Key Lake Operations is $2.5 billion compared to $1.4 billion in the 2009 Technical Report. More than 40% of this increase is related to the addition of more than 85 Mlbs U_3O_8 of new forecast production since the 2009 Technical Report and about 15% relates to expenditures required to allow production at a higher rate such as additional ventilation including the sinking of a fourth ventilation shaft. The remainder of the increase is related to expanding the infrastructure to support ongoing and expanded operations and general cost escalation. In 2013, Cameco's share of the estimated capital costs is $235 million.

In connection with changes to the production schedule, a number of critical mine infrastructure investments are planned. Capital cost estimates include an additional capital investment of approximately $285 million in connection with underground development associated with newly added Mineral Reserves and an additional capital investment of approximately $350 million for freeze installation and distribution costs and dewatering equipment planned for new mining areas. Additional ventilation costs of approximately $220 million have been included in order to support the entire mine throughout the mine life.

1.15 Project Risks

McArthur River is a challenging deposit to mine. These challenges include control of ground water, weak ground formations, radiation protection, water inflow, mine area transitioning, regulatory approvals, tailings capacity and other mine related challenges. Operational experience gained since the start of production has resulted in a significant reduction in risk.

1.15.1 Technical Risks

Water Inflow Risk

The greatest technical risk to the McArthur River Operation is production interruption from water inflows. A 2003 water inflow resulted in a three-month suspension of production. McArthur River also had a small water inflow in 2008 that did not impact production. Cameco has taken a number of steps to reduce the risk of inflows at McArthur River and to increase its inflow preparedness. Notwithstanding these efforts, inflows can occur and the risk of an inflow at McArthur River remains.

The consequences of another water inflow at McArthur River would depend on its magnitude, location and timing, but could include a significant interruption or reduction in production, a material increase in costs or a loss of Mineral Reserves.

Transition to New Mining Areas

In order to successfully meet the planned production in the life of mine schedule, Cameco must continue to successfully transition into new mining areas, which includes mine development and investment in critical support infrastructure. These investments are necessary in order to maintain the planned production schedule.

Failure to successfully transition to new mining areas or implement critical mine infrastructure could delay or reduce production, which could have a material and adverse effect on Cameco's earnings, cash flows, financial condition, results of operations and prospects.

The Zone 4 North transition planned in late 2014 carries a slightly higher transition risk than other mining area transitions due to the site's limited flexibility to offset a shortfall in production due to schedule delays.

1.15.2 Regulatory Risk

Tailings Capacity

Tailings from processing McArthur River ore are deposited in the Deilmann TMF. At current production rates, the approved capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018. Cameco is proceeding with an EA to support an application for regulatory approval to deposit tailings in the Deilmann TMF to a much higher level, which will provide adequate tailings storage for all of the known McArthur River Mineral Reserves.

A significant delay in obtaining or a failure to receive, the necessary regulatory approval for the Deilmann TMF expansion could interrupt or prevent the operation of the McArthur River and Key Lake Operations as planned.

Production Rate Increase

The production schedule includes a production rate increase to 22.0 Mlbs U_3O_8 per year in 2018, subject to receipt of regulatory approval. A corresponding increase to mill production at Key Lake will also be necessary. Cameco has initiated an EA at Key Lake which, among other matters, includes a proposed increase in its nominal annual production rate to 25 Mlbs U_3O_8.

A significant delay in obtaining or a failure to receive, the necessary regulatory approval for the increase in planned production at McArthur River to 22 Mlbs U_3O_8 per year or the corresponding increase to Key Lake of its production rate, could prevent the operation of the McArthur River and Key Lake Operations as planned.

If a delay in obtaining or a failure to receive, a regulatory approval results in an interruption or prevention of the planned production schedule at McArthur River and Key

Lake Operations, this could have a material and adverse effect on Cameco's earnings, cash flows, financial condition, results of operations and prospects.

Project risks are described in more detail in Section 24.3.

1.16 Conclusions and Recommendations

McArthur River is a mature operation that has successfully extracted over 225 Mlbs of U_3O_8 since its start of production in 1999. As of August 31, 2012, Cameco's share of the Mineral Reserves is estimated to be 269.1 Mlbs U_3O_8, an increase of 19.0% since December 31, 2011, due to a 22.1% increase in tonnage and only a slight decrease in the average grade.

The McArthur River mine represents a significant economic source of feed material for the Key Lake mill. With an estimated mine life of 22 years, McArthur River is forecast to produce a further 387 Mlbs U_3O_8 (mill recovered) as of August 31, 2012. At the forecast average realized uranium price over this 22 year period, it is estimated that Cameco will receive substantial positive net cash flows from its share of McArthur River production.

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, as of August 31, 2012, of $3.0 billion for its share of the McArthur River Mineral Reserves. Using the initial investment and operating cash flows from inception, the pre-tax IRR is estimated to be 11.9%.

Operating costs for the MRJV are estimated to average $19.23/lb U_3O_8 over the mine life. This a slight decrease since 2009, but it is considered to be significant given the general trend of escalating costs widespread across the mining industry, particularly in the areas of labour, energy and consumables.

Cameco's share of the total estimated life of mine capital costs for the McArthur River and Key Lake Operations is $2.5 billion compared to $1.4 billion in the 2009 Technical Report. More than 40% of this increase is related to the addition of more than 85 Mlbs U_3O_8 of new forecast production since the 2009 Technical Report and about 15% relates to expenditures required to allow production at a higher rate such as additional ventilation including the sinking of a fourth ventilation shaft. The remainder of the increase is related to expanding the infrastructure to support ongoing and expanded operations and general cost escalation.

In connection with changes to the production schedule, a number of critical mine infrastructure investments are planned. Capital cost estimates include an additional capital investment of approximately $285 million in connection with underground development associated with newly added Mineral Reserves and an additional capital investment of approximately $350 million for freeze installation and distribution costs and dewatering equipment planned for new mining areas.

Additional ventilation costs of approximately $220 million have been included in order to support the entire mine throughout the mine life. Additional ventilation volume will be required by the end of 2017 in order to meet production needs.

In order to execute the mine plan, the proposed operating and capital expenditures set out in Table 21-1 and Table 21-2 of Section 21 of this report are necessary and endorsed by the authors of this technical report. Project optimization, including completion of value engineering studies, is planned to continue as capital plans are advanced and implemented.

A sensitivity analysis of the McArthur River economics demonstrates that the McArthur River mine shows relatively low sensitivity to changes in operating or capital cost projections. The relative sensitivity to changes in price and ore grade is significantly higher due in part to the relatively high grade nature of the deposit and the price estimates being used. The significant difference between the average realized price of $60.92/lb U_3O_8 and the average operating cost of $19.23/lb U_3O_8 makes the mine economics less sensitive to changes in the average operating cost.

Although the mine plan does not currently include a production increase beyond the licensed production capacity of the McArthur River and Key Lake Operations until 2018, it is recommended that Cameco continue to prioritize in the near term securing the requisite approvals to implement the planned production schedule.

Cameco is continuing with its plan to secure regulatory approval from the CNSC for its planned McArthur River production rate increase to 22.0 Mlbs U_3O_8 by 2018. Cameco has initiated a separate EA for the Key Lake mill to extend its operational life and establish it as a regional mill by increasing the tailings capacity of the Deilmann TMF and increasing the nominal annual production rate of Key Lake to 25 Mlbs U_3O_8. Cameco may wish to consider the merits of a corresponding annual production rate increase at McArthur River to 25 Mlbs U_3O_8.

At current production rates, the approved licensed capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018. The Key Lake EA is required to support an application for regulatory approval to increase the tailings capacity of the Deilmann TMF by raising the tailings elevation. As the mine plan includes production beyond the current approved licensed capacity, it is recommended that Cameco continue to prioritize the Key Lake EA and track progress until regulatory approval for increased tailings capacity of the Deilmann TMF is received.

In connection with the Key Lake revitalization plan, a number of infrastructure improvements have been completed to date with the balance expected to be completed by 2016. Infrastructure improvements have largely mitigated prior reliability issues at Key Lake identified in the 2009 Technical Report.

The McArthur River Operation estimated Mineral Reserves have proven, thus far, to be slightly conservative with more lbs of U_3O_8 extracted than predicted. The Mineral Reserve model has been calibrated to more closely predict actual production results. Over the past five years, reconciliation of mine production with the model is within on average 5% of the estimated pounds U_3O_8.

An average uranium price of US$61 per Lb U_3O_8 was used with a US$1.00 = Cdn$1.00 fixed exchange rate to estimate Mineral Reserves. Due to the high grade nature of the McArthur River deposit, the McArthur River Mineral Reserves are robust and not significantly sensitive to variances in uranium price of plus or minus $20 provided that the annual production remains above 10 million pounds U_3O_8 (approximately 1% variance in Mineral Reserves).

Cameco has demonstrated that the challenging conditions associated with mining the McArthur River Mineral Reserves can be managed. Operational experience gained since the start of commercial production has resulted in a significant reduction in risk.

Recognizing that water inflow is considered by Cameco to be the greatest technical risk to the McArthur River Operation, Cameco has established a number of risk inflow mitigation measures and inflow preparedness standards and practices including:

- Ground freezing: Before mining, Cameco drills freezeholes and freezes the ground to form an impermeable freezewall around the area being mined. Ground freezing reduces, but does not eliminate the risk of water inflows. To date, Cameco has installed five freeze walls and is currently preparing a sixth. Improvements in drilling equipment and freeze wall design have resulted in the entire Mineral Reserve being amenable to extraction by raisebore mining method.

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

- Pumping capacity and treatment limits: Cameco's standard for McArthur River is to secure pumping capacity of at least one and a half times the estimated maximum sustained inflow. Cameco believes it has sufficient pumping, water treatment and surface storage capacity to handle the estimated maximum sustained inflow. Cameco reviews its dewatering system and requirements at least once a year and before beginning work on any new zone.

As the mine plan is advanced, Cameco plans to make improvements to its dewatering system and to expand its water treatment capacity. The capital cost estimate includes provisions for improvements and expansion.

Ongoing assessment, review and optimization of mine dewatering and treatment capacity requirements are planned to continue as capital plans advance. As well, Cameco plans to continue with current management practices for assessing risk of inflow and inflow prevention in the ordinary course.

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

2 INTRODUCTION

2.1 Introduction and Purpose

This technical report has been prepared for Cameco by, or under the supervision of, internal qualified persons in support of disclosure of new scientific and technical information related to the McArthur River Operation, including Cameco's new Mineral Resource and Mineral Reserve estimates, as contained in Cameco's management`s discussion and analysis for the nine months ended September 30, 2012 and the corresponding press release.

The technical report has an effective date of August 31, 2012 and has been prepared in accordance with NI 43-101 by, or under the supervision of, the following individuals:

- David Bronkhorst, P.Eng., VP, Saskatchewan Mining South, Cameco;
- Alain G. Mainville, P.Geo., Director, Mineral Resources Management, Cameco;
- Gregory M. Murdock, P.Eng., Technical Manager, McArthur River Mine, Cameco; and
- Leslie D. Yesnik, P.Eng., General Manager, Key Lake Operation, Cameco.

These individuals are the qualified persons responsible for the content of this report. All four qualified persons have visited the McArthur River and Key Lake sites.

Alain G. Mainville has been involved with the McArthur River Operations since 1995 and has visited the site on numerous occasions. Mr. Mainville was previously an employee at Key Lake for seven years. Mr. Mainville's last personal inspection of the McArthur River and Key Lake Operations occurred more than a year ago. During the last 12 months, Mr. Mainville supervised his department visiting the site and participated in discussions with respect to McArthur River related to drilling, sampling, geological interpretation, grade modeling, mineral reserves and resources and mine production reconciliation.

Mr. Bronkhorst, from 2007 to 2010, was the General Manager of the McArthur River Operation and was present at the site generally twice a month for periods extending up to four days. Since 2010, Mr. Bronkhorst has taken on the role of Vice-President of Saskatchewan Mining South with responsibilities that include the oversight of both the McArthur River and Key Lake Operations. Tours of the operations are generally conducted on a quarterly basis. Mr. Bronkhorst's last personal inspection of the McArthur River Operation occurred on September 27, 2012 and included an inspection of both the underground and surface operations. Mr. Bronkhorst's last personal inspection of the Key Lake Operation occurred on July 29, 2012 with a general inspection of the surface and area road networks.

Mr. Murdock is the Technical Manager for the McArthur River mine site and is responsible for the site's technical groups (geology, mine engineering, process engineering, maintenance engineering, mining methods development and site projects). He has worked at the mine site since 2002 in various engineering, mine operations and management roles. Mr. Murdock is present at the site generally four times a month for three to four consecutive days. Underground and surface inspections of ongoing development, construction, project and production activities is part of his work routine when at site. Mr. Murdock's last personal inspection of the McArthur River Operation occurred from October 19th to 22nd, 2012, which included both surface and underground visits.

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 seven days. Tours of the operations are generally conducted monthly. Mr. Yesnik's last personal inspection of the Key Lake Operation occurred on October 16, 2012 and included a general inspection of all surface facilities and area road networks.

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 and Key Lake Operations that were used in preparation of this report are listed in Section 27.

All monetary references in this technical report are expressed in Canadian dollars, unless otherwise indicated.

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

UTM Northing = ((Mine Easting x -0.726562678) + (Mine Northing x 0.687100191) + 6401721.111

UTM Easting = ((Mine Easting x 0.687100191) – (Mine Northing x -0.726562678) + 485669.566) x .999989

An elevation datum was also established for the mine grid as provided below.

Mine Elevation = masl + 1,000 m

3 RELIANCE ON OTHER EXPERTS

The authors have relied, and believe they have a reasonable basis to rely, upon the following individuals who have contributed the environmental, legal, marketing and taxation information stated in this report, as noted below in Table 3.1. Unless otherwise noted, information is presented as of August 31, 2012.

Table 3.1: Reliance on Other Experts

Name	Title	Section No. (description)
Jean Alonso, P.Eng.	Director, Safety Health Environment and Quality (SHEQ) – Compliance & Licensing, Cameco	1.12 (a description of tailings management facilities) 20.4 (a description of significant environmental aspects) 20.5 (a discussion of decommissioning and reclamation) 20.6 (a discussion of known environmental liabilities)
Larry Korchinski, LLB	Director, Legal Services and Assistant General Counsel, Cameco	1.4 and 4.2 (a description of mineral tenure) 1.4 and 4.3 (a description of surface tenure) 6.1 (a description of ownership) 19.2 (a description of contracts), but excluding subsection 19.2.3 (a description of uranium sales contracts)
Derek Gross, B. Comm, MBA	Director, Marketing Strategy, Cameco	19.1 (a description of uranium markets) 19.2.3 (a description of uranium sales contracts)
Randy Belosowsky, CA.	Director, Special Projects - Tax, Cameco	22.5 (a description of taxes) 22.6 (a description of royalties)

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The McArthur River mine site is located near Toby Lake in northern Saskatchewan, approximately 620 km north of Saskatoon, at approximate latitude 57° 46' north and longitude 105° 03' west, and about 40 km inside the eastern margin of the Athabasca Basin Region in northern Saskatchewan, Canada (see Figure 4-1). Toby Lake is a small lake which is close to the mine site. Read Lake and Yalowega Lake are nearby lakes.

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

Figure 4-1: McArthur River Operation Location

2012)

Source: Cameco

4.2 Mineral Tenure

The McArthur River property consists of one mineral lease (Mineral Lease or ML-5516) and 21 mineral claims (Mineral Claims) totalling 84,818 ha. ML-5516, which hosts the McArthur River deposit, sits on the northwestern edge of the Mineral Claims.

The right to mine the McArthur River deposit was acquired by Cameco under this Mineral Lease, as renewed, effective March 8, 1994 from the Province of Saskatchewan. Cameco holds this leasehold interest on behalf of the MRJV, in its capacity as operator of the McArthur River Operation. This Mineral Lease, which totals 1,380 ha, 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. The Province of Saskatchewan may only terminate ML-5516 if Cameco breaches a provision of the lease or fails to satisfy any of its obligations under *The Crown Minerals Act* (Saskatchewan) or associated regulations, or in the event that any prescribed environmental concerns arise. The current mineral lease expires in March 2014.

The 21 Mineral Claims, which were granted by the Province of Saskatchewan to Cameco under *The Crown Minerals Act* (Saskatchewan), total 83,438 hectares. These Mineral Claims grant Cameco the right to explore for minerals within the claim lands. Cameco holds title to the Mineral Claims on behalf of the MRJV, in its capacity as operator of the McArthur River Operation. 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.

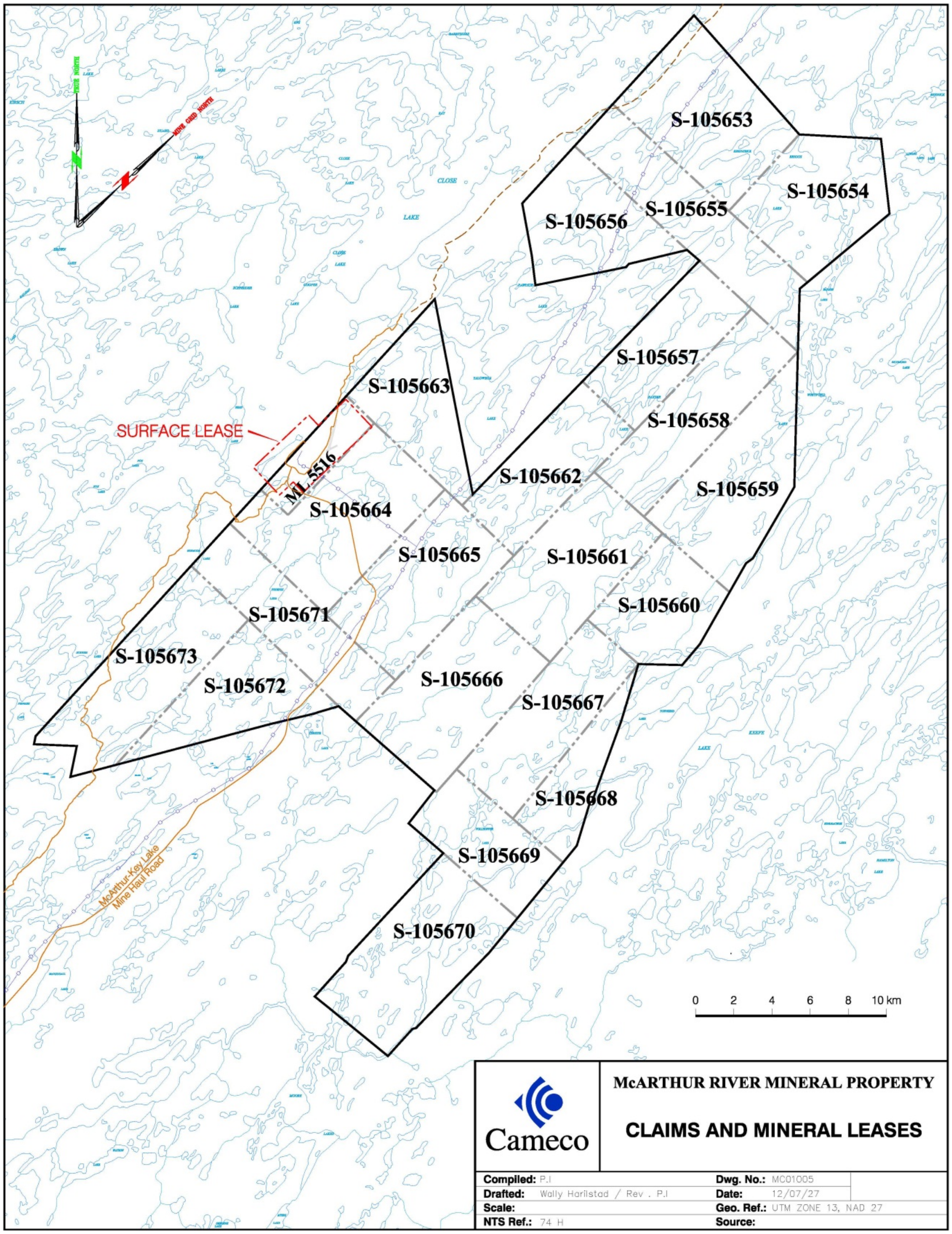
An annual cash payment of $13,800 is required to maintain ML-5516 in good standing. The 21 Mineral Claims require annual exploration expenditures of $2,085,950. Based on previous work submitted and approved by the Province of Saskatchewan, title is secured until 2018 or greater. Table 4-1 shows status of ML-5516 and the Mineral Claims.

Table 4-1: McArthur River Operation – Disposition Status

Disposition	Record Date (day/month/year)	Area (ha)	Annual Assessment	Next Payment Due (day/month/year)
ML-5516	**8-Mar-84**	**1,380**	**$13,800**	**08-Mar-13**
S 105653	8-Mar-77	4,880	$122,000	08-Mar-18
S 105654	8-Mar-77	4,076	$101,900	08-Mar-18
S 105655	8-Mar-77	4,380	$109,500	08-Mar-24
S 105656	8-Mar-77	3,434	$85,850	08-Mar-24
S 105657	8-Mar-77	3,290	$82,250	08-Mar-24
S 105658	8-Mar-77	4,060	$101,500	08-Mar-29
S 105659	8-Mar-77	4,752	$118,800	08-Mar-18
S 105660	8-Mar-77	2,945	$73,625	08-Mar-18
S 105661	8-Mar-77	4,505	$112,625	08-Mar-21
S 105662	8-Mar-77	3,470	$86,750	08-Mar-28
S 105663	8-Mar-77	3,248	$81,200	08-Mar-20
S 105664	8-Mar-77	5,055	$126,375	08-Mar-28
S 105665	8-Mar-77	4,519	$112,975	08-Mar-28
S 105666	8-Mar-77	4,930	$123,250	08-Mar-25
S 105667	8-Mar-77	3,926	$98,150	08-Mar-19
S 105668	8-Mar-77	2,075	$51,875	08-Mar-20
S 105669	8-Mar-77	2,838	$70,950	08-Mar-20
S 105670	8-Mar-77	5,207	$130,175	08-Mar-20
S 105671	8-Mar-77	3,586	$89,650	08-Mar-26
S 105672	8-Mar-77	3,390	$84,750	08-Mar-26
S 105673	8-Mar-77	4,872	$121,800	08-Mar-26
Total Claims (21)		**83,438**	**$2,085,950**	
Total Lease (1) and Claims (21)		**84,818**	**$2,099,750**	

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

Figure 4-2: Mineral Lease and Mineral Claims Map



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

4.3 Surface Tenure

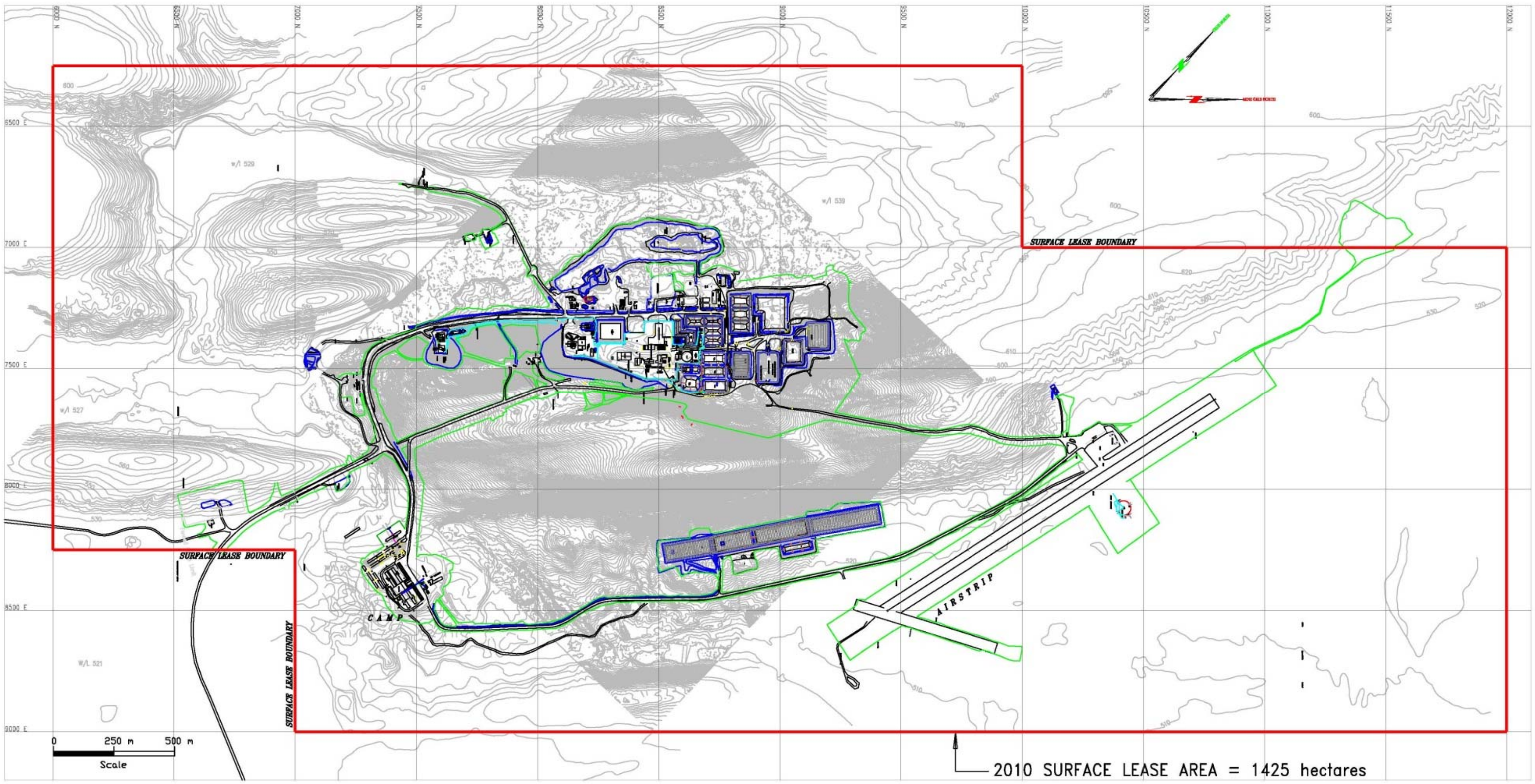
The surface facilities and mine shafts for the McArthur River Operation are located on lands owned by the Province of Saskatchewan. Cameco acquired the right to use and occupy the lands under a surface lease agreement with the Province of Saskatchewan. The most recent surface lease agreement was signed in November 2010 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 1,425 ha.

The McArthur River mine site is compact, occupying approximately an area of one km^2, not including the nearby airstrip and camp facilities. Figure 4-3 shows the McArthur River general site arrangement with the outline of the surface lease.

In addition to the surface lease described above, there are five quarry leases pursuant to which Cameco, as operator of the MRJV, may use certain leased lands to carry out quarrying of sand, gravel, rock and clay, as applicable, in connection with its operations at McArthur River.

In 2012, the annual rent for the McArthur River surface lease and quarry leases is expected to be $611,784 and $19,063, respectively, together with taxes of $1,603,372 in respect thereof.

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



Source: Cameco

Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

4.4 Royalties

For a discussion of royalties, see Section 22.6.

4.5 Known Environmental Liabilities

For a discussion of known environmental liabilities, see Section 20.6.

4.6 Permitting

For a discussion of permitting, see Sections 20.1, 20.2 and 20.3.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

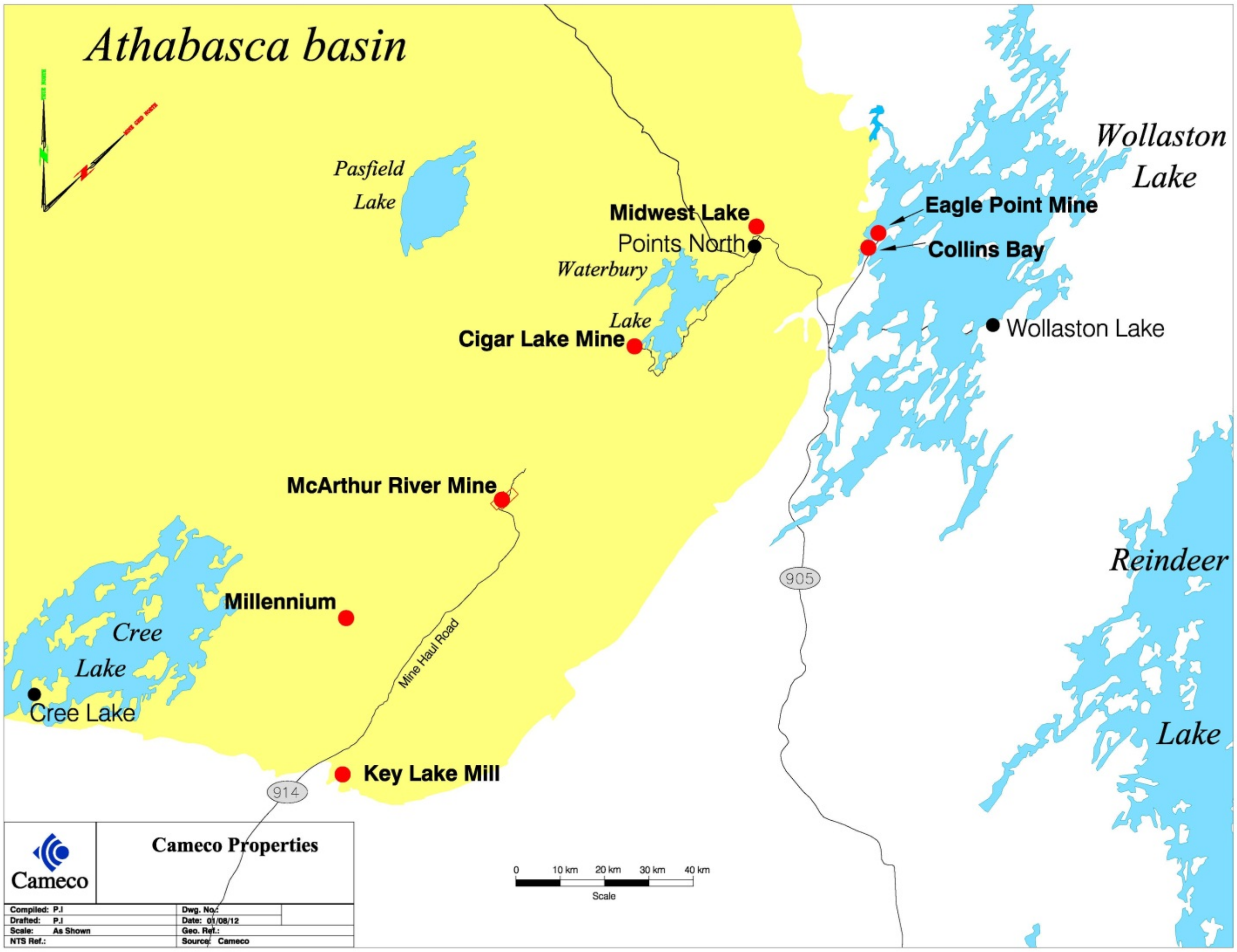
5.1 Access

The McArthur River property is accessible by all-weather 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. An 80 km all-weather gravel road maintained by Cameco runs between the mine site and the Key Lake Operation. This road is used to transport material to Key Lake for processing and to ship supplies to McArthur River. Although classified as a provincial road, public access to this road is controlled and restricted for security and safety reasons. U_3O_8 is shipped from the Key Lake Operation by truck year round to Saskatoon and elsewhere.

Figure 5-1 shows the regional location of the McArthur River site and local roads.

An unpaved airstrip and terminal are located approximately one km east of the mine site within the surface lease, allowing flights to and from the McArthur River property.

Figure 5-1: McArthur River Site – Regional Location and Roads



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

5.2 Climate

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

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

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

Site operations are carried out 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 is 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 30 years and have modified the local vegetation.

The mine site elevation is approximately 550 masl.

5.4 Local Resources

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 914. The McArthur River mine site is a further 80 km northeast from the Key Lake site.

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.

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.

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, rail and air links to the rest of North America.

5.5 Mine and Infrastructure

McArthur River is a developed producing property with sufficient surface rights to meet all of its current mining operation needs. The McArthur River mine site contains all the necessary services and facilities to operate a remote underground mine. Site facilities include a 1.6 km long gravel airstrip and air terminal, permanent residence and recreation complex, administration and maintenance shops building, warehouse, water containment ponds and treatment plant, freeze plant, concrete batch plant, one full service shaft and two ventilation shafts, site roads, powerhouse, electrical substations, ore slurry load out facility, freshwater pump house and miscellaneous infrastructure.

The McArthur River mine site receives its electrical power from the provincial grid via the I2P line. The current Saskatchewan Power service contract is for 15 MVA supply. The site currently has 14.3 MW of back-up generation which is sufficient to maintain operations during power interruptions.

The McArthur River mine site has access to sufficient water from nearby Toby Lake to satisfy its surface industrial and residential water requirements. Sufficient shaft water (water leaking into the shafts from the sandstone formation) is available to meet all underground process water requirements.

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

All mineralized material is shipped to the Key Lake mill for ore processing so no tailings management facilities exist at the McArthur River site. Mineralized waste from skipping is temporarily stored on lined containment pads and high grade ore slurry pumped from the underground is temporarily stored in the slurry load out facility. The processing facility at Key Lake is discussed in Section 17.3. The tailings management facility at Key Lake is discussed in Section 20.4.

Potentially acid generating waste from development is also temporarily stored on lined containment pads for future use as concrete aggregate. Clean development waste requires no containment and is stored for future concrete aggregate or road capping material. Waste rock management is discussed in Section 20.4.

A site plan of the existing surface facilities is shown in Figure 4-3. Expansion of the sites facilities is required to support development of new mining areas and meet production targets. Electrical, freeze plant, ventilation and water handling and treatment expansions are all considered critical to successfully mine the known Mineral Reserves. A discussion of the planned surface infrastructure expansion as well as the mine shafts and other infrastructure at the McArthur River site is included in Section 18.

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 most recent of which occurred in 2009. The current owners and their participating interests in the MRJV are as follows:

- Cameco (69.805%); and
- AREVA (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.

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

In 1999, AREVA acquired one-half of the shares of UEM, 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%.

In 2009, UEM distributed equally to its shareholders (Cameco and AREVA):

- its 27.922% interest in the MRJV, giving Cameco a 69.805% direct interest, and AREVA a 30.195% direct interest; and

- its 33 1/3% interest in the KLJV, giving Cameco an 83 1/3% direct interest, and AREVA a 16 2/3% direct interest.

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 mineralization. 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. The shaft was completed in 1994. Approvals for mine construction and development were obtained in 1997. 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 6-1). Other significant, but sub-economic discoveries that 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 northeastern portion of the conductor encountered structural disruption and sandstone alteration in hole MAC-195. MAC-196 was collared about 100 m away and intersected weak sandstone hosted mineralization, with characteristics similar to P2 Main. The next hole, 100 m northeast, 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 mineralization over a strike length of 1,700 m and occurring at depths ranging between 500 m and 640 m.

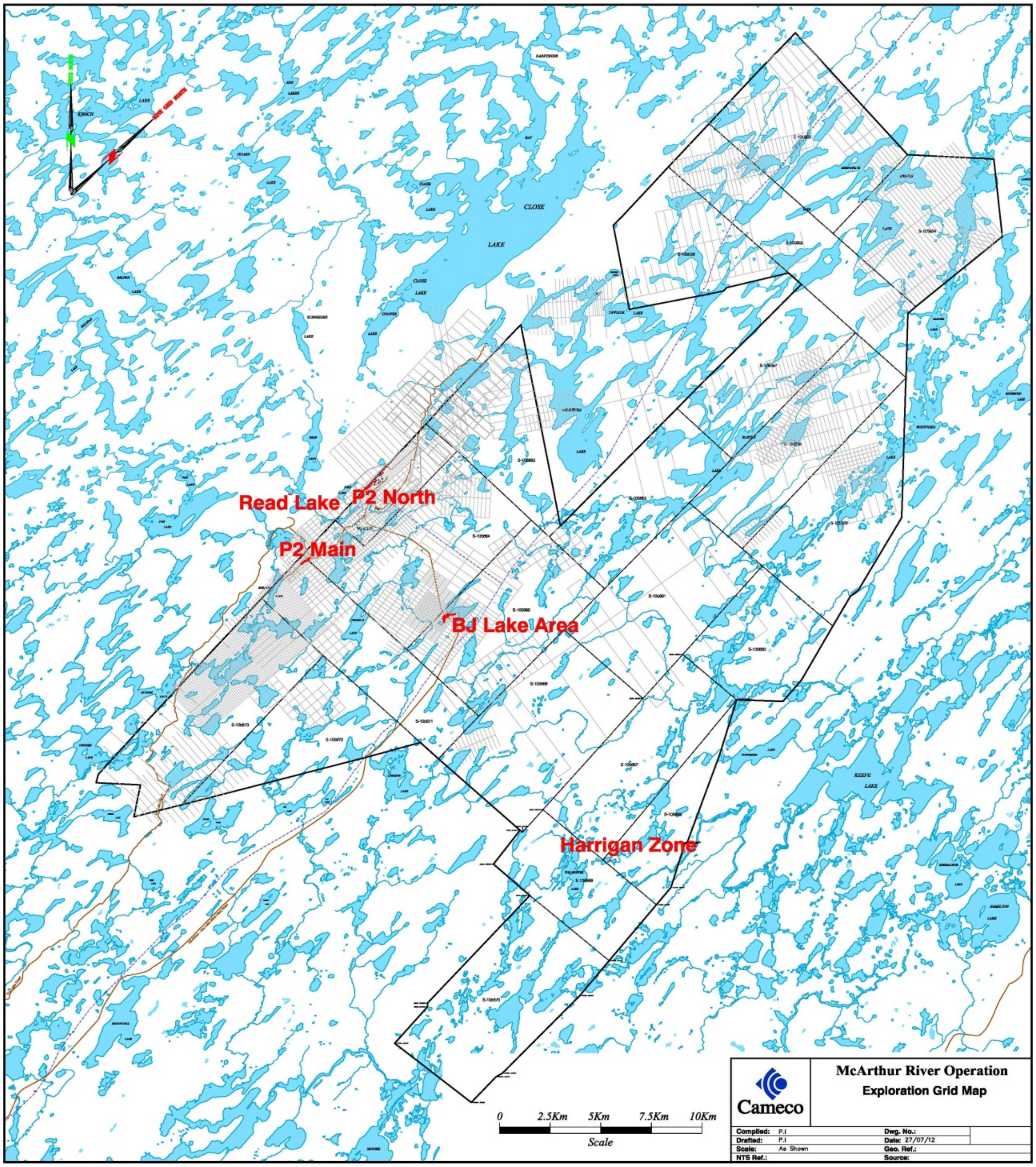
Since 1993, over 910 underground drillholes, totalling in excess of 82,000 m, have provided detailed information for 950 m of the strike length. Over 2,275 additional underground diamond drillholes, totalling 143,000 m, were drilled for geotechnical information; probe and grout covers; service and drain holes; and freezeholes.

Nine distinct mineralized areas have been identified at the McArthur River deposit. Five of these have been well defined with underground drilling, namely Zones 1, 2, 3, 4 and 4 South. The remaining four, McA North (1), McA North (2), Zone A and Zone B are based entirely on surface drilling. McA North (1) has recently experienced underground drilling (results pending). Underground drilling was recently started on Zone A and is ongoing.

Two under-explored mineralized showings, known as McA North (3) and McA South, as well as other mineralized occurrences, will be followed up on if warranted.

Diamond drilling to evaluate the P2 trend northeast of the McArthur River mine has been ongoing since 2004. In 2007, surface diamond drilling to evaluate the P2 trend both northeast and southwest 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 August 31, 2012, 153 surface drillholes totalling in excess of 91,000 m, comprising a combination of conventional and directional diamond drilling, have tested the P2 structure at approximately 200 m intervals for a distance of 4.3 km northeast and 6.4 km southwest of the mine, respectively. Results continue to be encouraging with a number of segments of the P2 structure identified for further follow-up drilling.

Figure 6-1: Map of P2 Grid and Discoveries on the Mineral Lease and Mineral Claims



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

6.3 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 licence limit of 18.718 Mlbs U_3O_8 per year (see Table 6-1). As at August 31, 2012, Cameco's share of the mine production for 2012 was 9.557 Mlbs U_3O_8 and portions of it remain stockpiled.

Table 6-1: McArthur River Historical U_3O_8 Mine Production

Year	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8	Comments
1999	-	-	-	-	One production raise mined ≈50,000 lbs 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.
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	
2009	65.2	12.9	18.530	12.935	
2010	78.0	11.3	19.341	13.501	
2011	80.2	11.2	19.732	13.774	
2012(1)	58.9	10.5	13.691	9.557	
TOTAL(2)	**758.7**	**13.5**	**225.531**	**157.432**	

Notes: (1) As of August 31, 2012.
(2) Totals may not add up due to rounding.

6.4 Historical Mineral Resource and Mineral Reserve Estimates

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

7 GEOLOGICAL SETTING AND MINERALIZATION

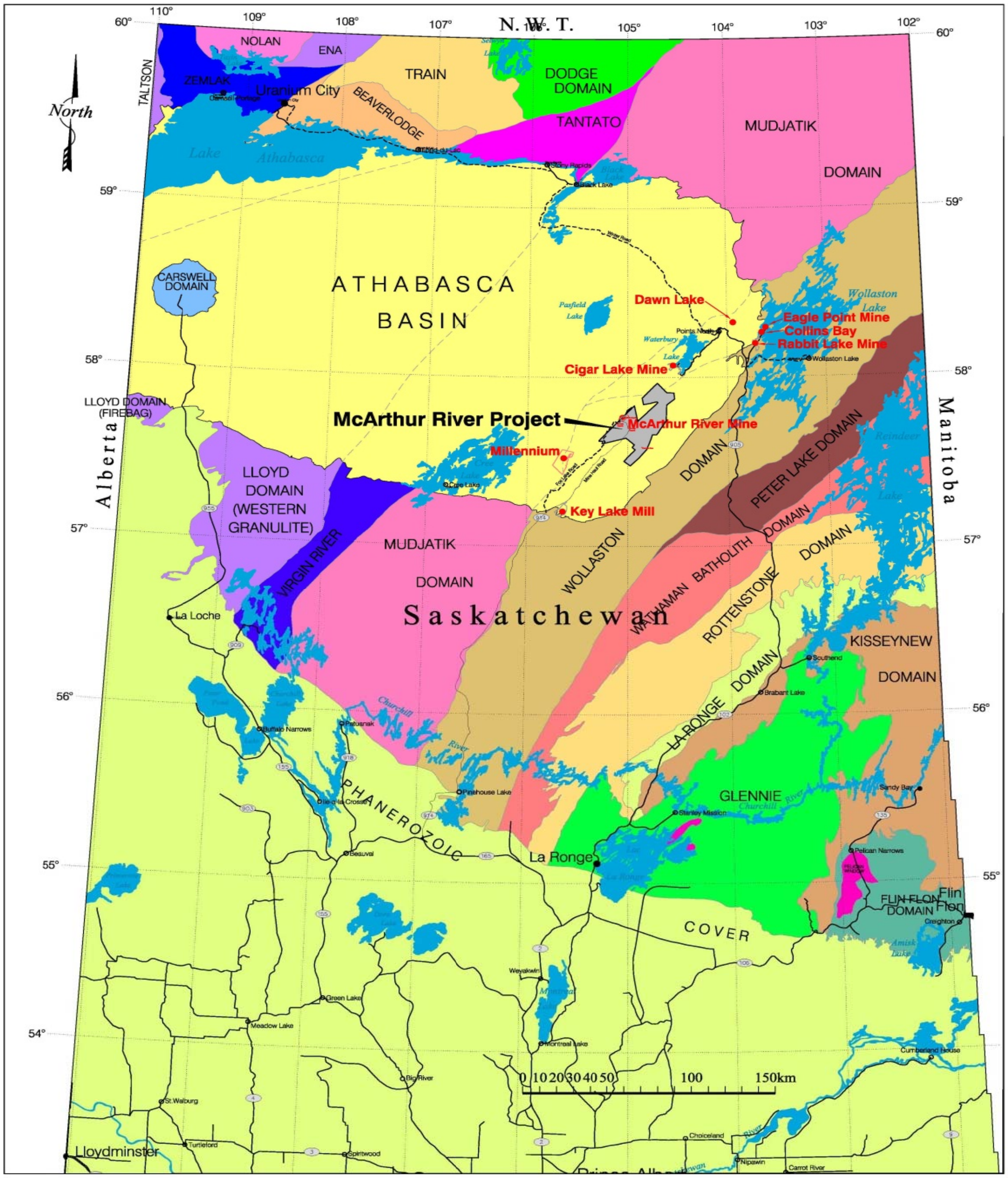
7.1 Regional Geology

The McArthur River deposit is located in the southeastern portion of the Athabasca Basin, within the southwest 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 7-1). 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 7-1: Geological Map of Northern Saskatchewan



Source: Cameco

7.2 Local Geology

The McArthur River mineralization, generally occurring at depths ranging from 500 m to 640 m, is structurally controlled by the northeast-southwest trending (45^o azimuth) P2 reverse fault which dips 40-65^o 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.

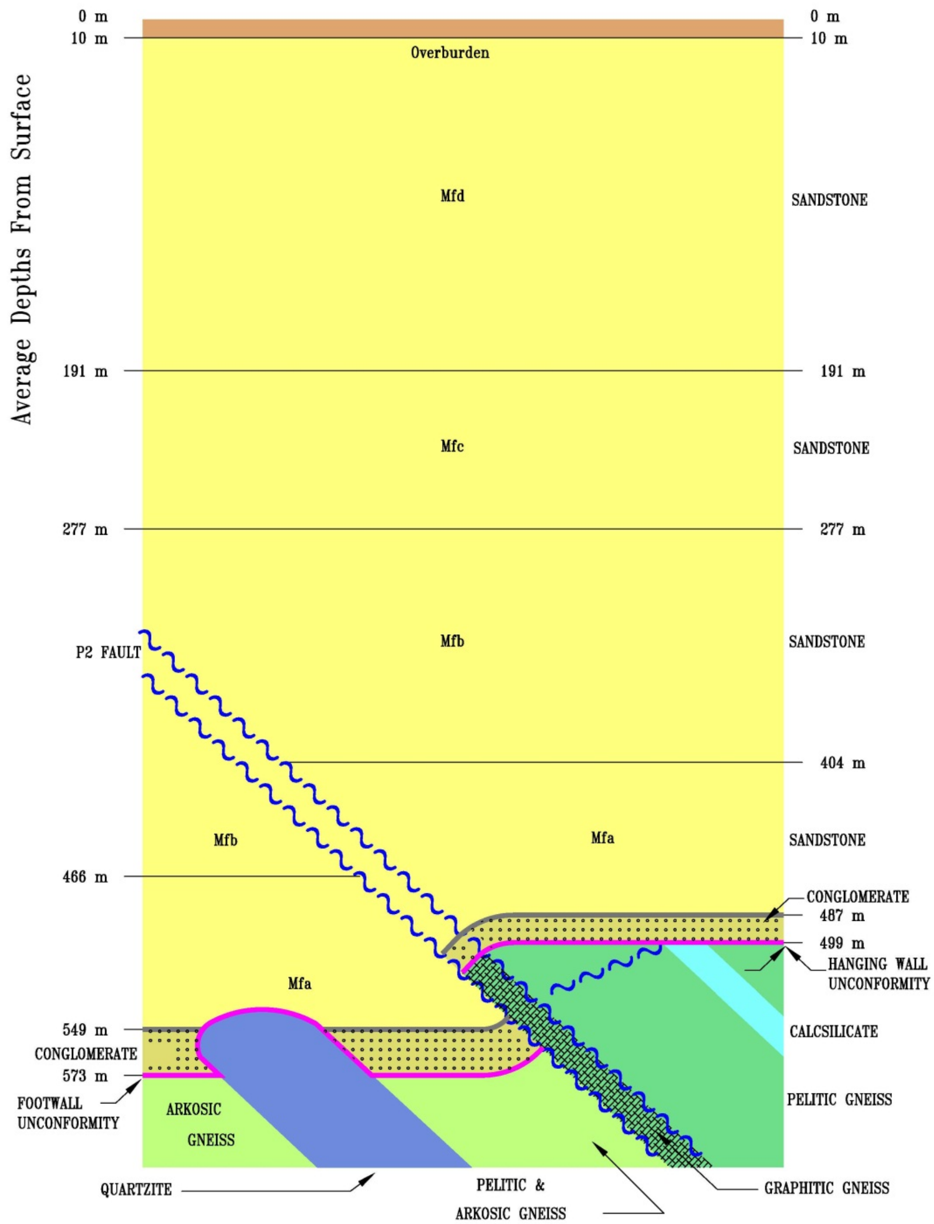
The Wollaston Domain stratigraphy in the deposit area has been divided by the mine geology staff into three blocks, based on their lithological and structural characteristics. Uppermost is the Hanging Wall Block, consisting of biotite and garnet gneiss, and calcsilicate. The Middle Block consists of 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 7-2). A basal conglomerate containing pebbles and cobbles of quartzite unconformably overlies the crystalline rocks of the Wollaston Group.

Zone 2 is unique in that the mineralization is predominantly basement hosted and occurs in the footwall of the P2 reverse fault (See Figure 7-2 and Figure 7-4). The remainder of the mineralization occur at or near the sandsone/basement fault contact, present in both the sandstone and basement lithologies. To date, over 215 Mlbs U_3O_8 has been extracted from Zone 2 and another 10 Mlbs U_3O_8 has come from Zone 4.

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 7-2: McArthur River Deposit – Schematic Cross-Section Looking Northeast



Cameco	McArthur River Operation GEOLOGICAL-SECTION Schematic Cross Section Indicating Rock Type			
MINE ENGINEERING REF No.	DWG FILE No.	FILE INDEX	Figure	REV
	F71-010	12771		RE

7.3 Property Geology

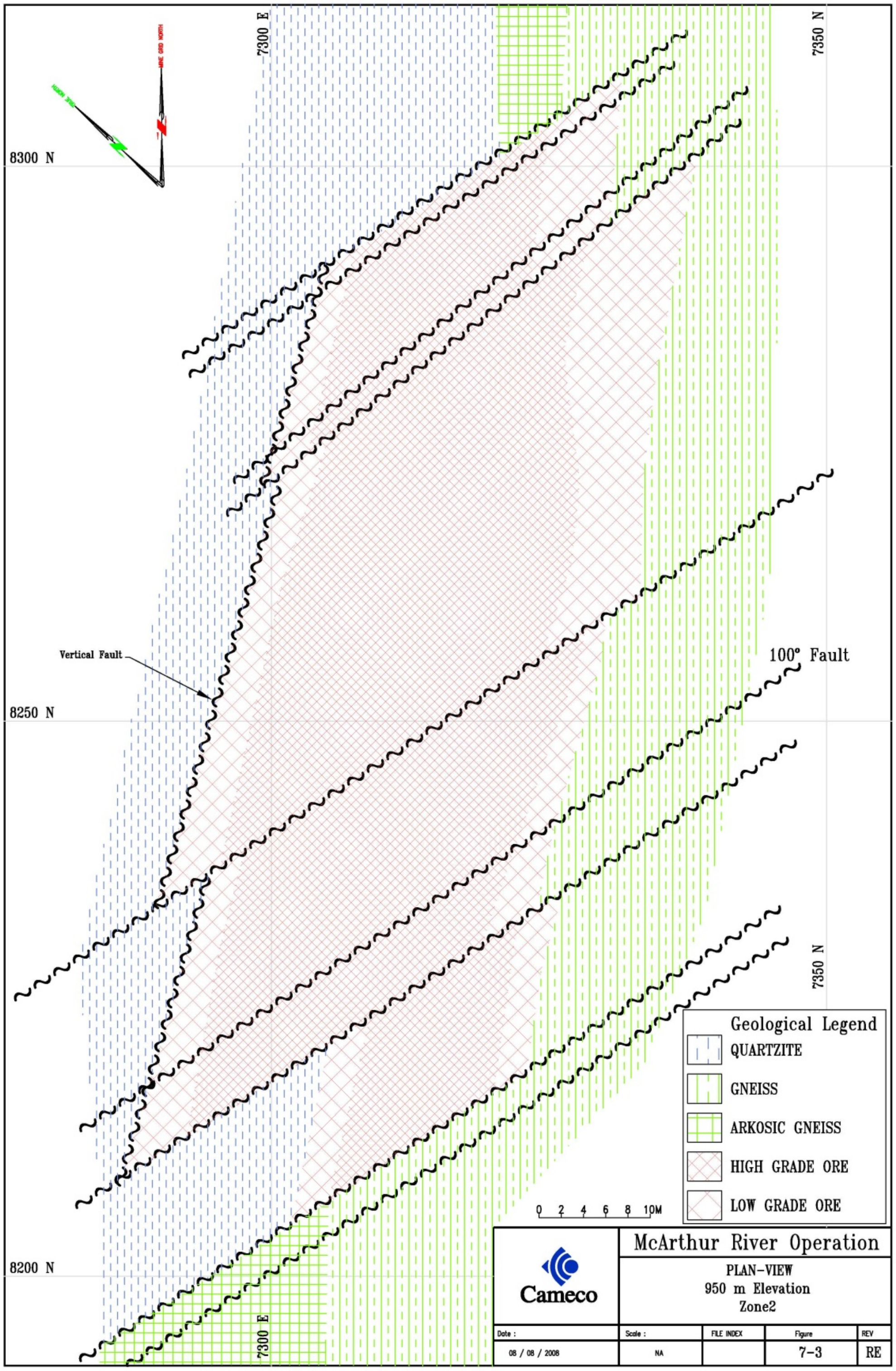
7.3.1 Structure

The northeast trending P2 thrust fault is the dominant structural feature of the McArthur River deposit (See Figure 7-2 and Figure 7-4). 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 100-110^{o} and at 160-170^{o}, both steeply dipping and generally within 30^{o} 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 7-3 is a plan view of the 950 m elevation illustrating the interpreted 100-110^{o} faults.

A significant vertical fault developed, at least locally, in the Zone 2 area. This area 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 7-3: Plan View of Zone 2 at the 950 m Mine Elevation



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

7.3.2 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 relatively competent 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.

Alteration 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.

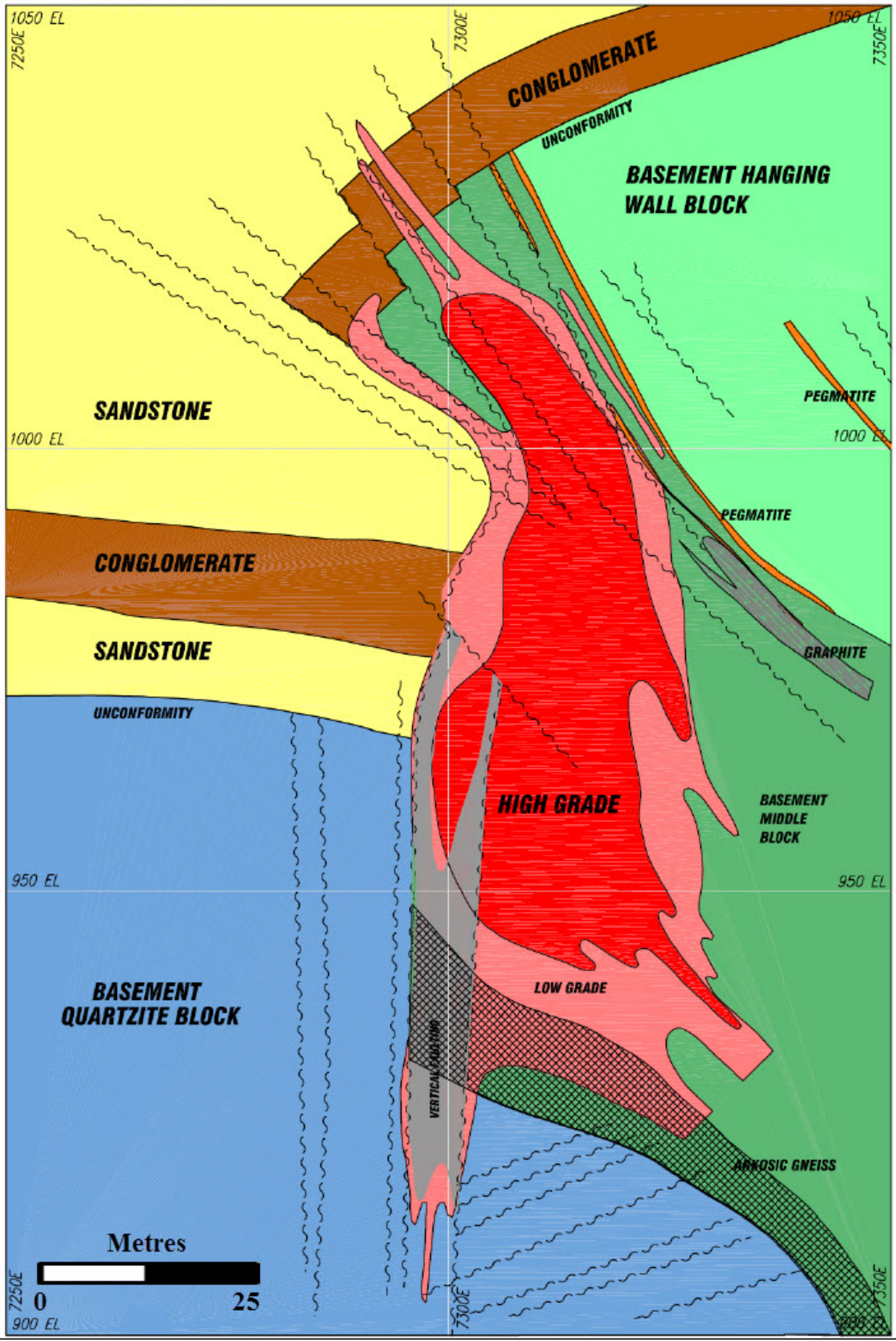
7.4 Mineralization

All of the McArthur River mineralization is associated with the graphitic P2 thrust fault. With the exception of Zone 2, most of the mineralization occurs in both the Athabasca sandstone and adjacent basement rocks, near the main zone of thrust faulting.

Zone 2 mineralization occurs deeper in the basement rock in a unique area of the deposit (See Figure 7-4). At Zone 2, a massive footwall quartzite unit lies in close proximity to the main zone of thrust faulting.

The deposit consists of nine distinct mineralized areas and two under explored surface defined mineralized showings over a strike length of 2,700 m, from 7225N to 9925N. The mineralized areas are named Zone 1, Zone 2, Zone 3, Zone 4, Zone 4 South, Zone A, Zone B, McA North (1) and McA North (2). The mineralized showings are designated as McA North (3) and McA South. Figure 7-5 shows the orthogonal view of the underground development and mineralized zones (not including McA North (1) and McA North (2)).

Figure 7-4: Typical Zone 2 Geological Section Looking Northeast



Source: Cameco

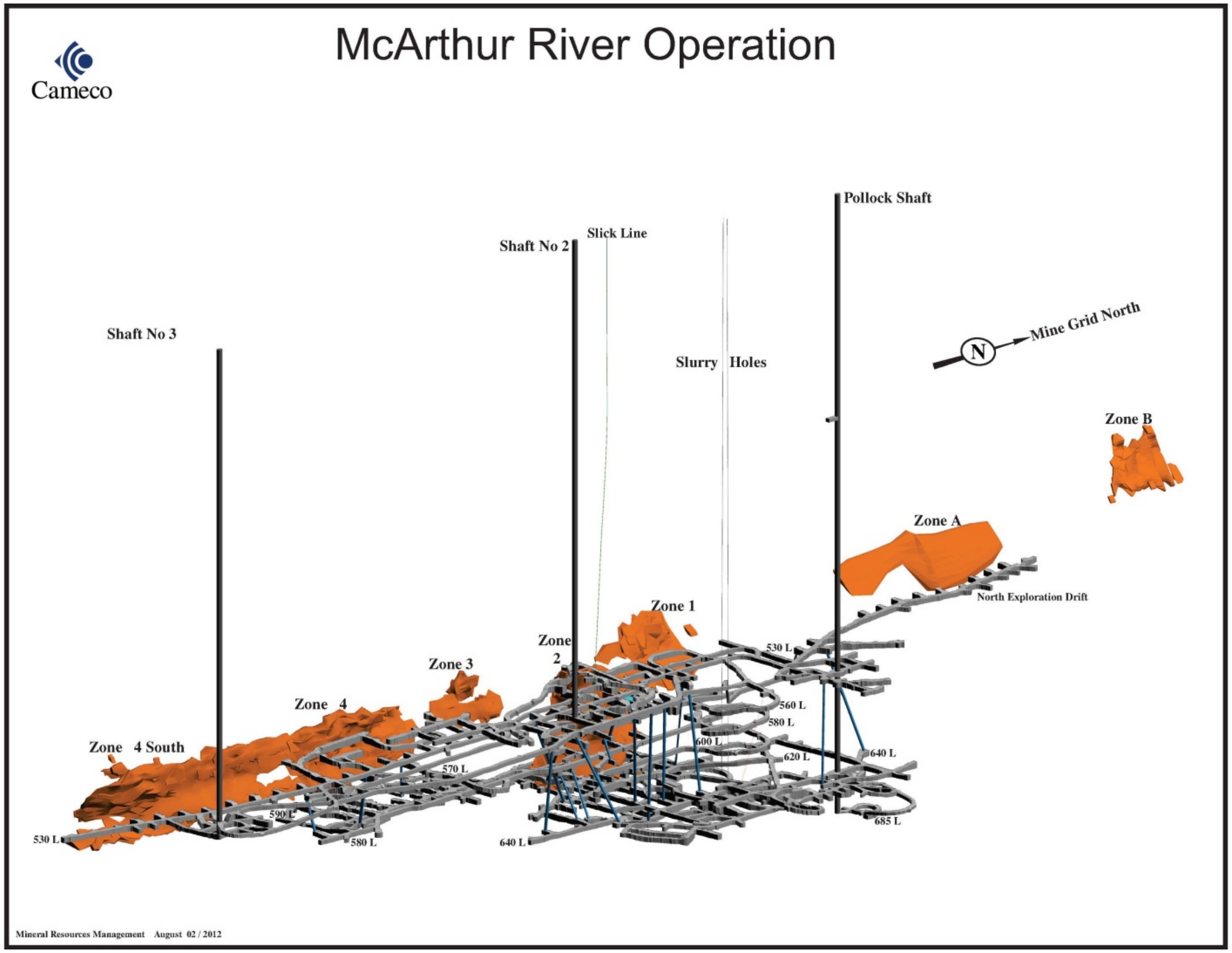
Uranium mineralization has been delineated from surface drilling over a strike length of 1,700 m and occurring at depths ranging between 500 m to 640 m below surface. Recent surface drilling has extended the potential strike length to 2,700 m. Mineralized widths are variable along strike but the most 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 main part of the mineralization, generally at the upper part of the basement wedge, averages 12.7 m in width and attains a maximum width of 28 m (Zone 2). The vertical extent of the mineralization ranges from 50 m to 120 m.

The P2 thrust fault, also known as the P2 structure, 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 areas 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 presence of this quartzite unit has resulted in a structurally disrupted zone that has affected a wide block of the footwall basement rocks. This 120 m long segment of the basement rock hosts the Zone 2 mineralization. To the northeast and to the southwest, the quartzite unit trends away to the west and the tectonics of the thrust fault returns to a more planar nature (See Figure 7-4).

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.

Figure 7-5: Orthogonal View of Underground Development and Mineralized Zones Looking Northwest



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 km 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 EXPLORATION

ML-5516, which hosts the McArthur River deposit (also known as P2 North), sits on the northwestern edge of the Mineral Claims which comprise the McArthur River project.

9.1 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 drillholes were completed during the 1978 and 1979 campaigns on what is now known as the McArthur River property.

9.2 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 Eldorado Resources Limited to form 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.

9.3 Recent Exploration 2000 – Present

Surface exploration resumed on the McArthur River project in 2000 after an eight year hiatus in drilling (see Table 9-1). 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 northeast and southwest of the mine. A total of approximately 7,400 m in 14 holes were drilled in this three year period. Positive drill results from 0.1% U_3O_8 / 1.0 m to 12.1%

U_3O_8 / 30 m northeast of the Pollock Shaft, culminated in the definition of Zone A. In 2004, a 3D borehole seismic survey was conducted in the vicinity of Zone A.

In 2005, exploration activities continued to focus on the area northeast of the Pollock Shaft. Diamond drilling of five holes totalling approximately 3,310 m continued on Zone A and on a second prospective area to the northeast, in the vicinity of historic drill hole MAC-198 (4.7% U_3O_8 / 10 m). Two drill holes testing this northeastern area intersected high grade mineralization with chemical grades of 35.9% U_3O_8 / 30.5 m and 6.25% U_3O_8 / 34.3 m. This zone of mineralization located 400 m northeast of Zone A was referred to as Zone B.

In 2006, exploration focused on further defining Zone B and examining the P2 structure immediately northeast of this zone. Diamond drilling (10 holes / 5,361 m) extended Zone B marginally with MC-278 (7.7% U_3O_8 / 20.5 m) while the remaining holes only intersected low grade mineralization. In conjunction with the drill program, Fixed Loop TDEM surveying was conducted along the southwestern portion of the P2 trend and a 3D borehole seismic survey was unsuccessfully attempted in the vicinity of Zone B.

Consecutive diamond drill programs in 2007 through 2008 focused on the systematic testing (200 m centers) of the P2 Trend northeast of Zone B. During this period, 30,319 m was drilled in 55 drill holes comprising a combination of conventional and directional drilling. Highlights of these programs include the discovery of low grade mineralization intersected approximately 800 m northeast and along strike of Zone B. The best intersection within this mineralization, currently referred to as McA North (3), was 11.8% e U_3O_8 / 2.6 m. Local occurrences of weak mineralization, up to 0.56% e U_3O_8 / 1.1 m, were also encountered in systematic drilling along the northeastern extent of the P2 Trend. With completion of these drill programs, a first pass evaluation of the P2 Trend was completed to 4.3 km north of the McArthur River deposit. Airborne geophysical surveys completed during this two year period included property-wide gravity coverage, select Triaxial magnetic gradiometer coverage and VTEM surveys over the Harrigan area and northeastern portion of the P2. Ground definition EM surveys (Fixed Loop and stepwise Moving Loop TDEM) were also conducted over the northeastern portion of the P2 Trend prior to drill testing.

The 2009 exploration program remained focused along the P2 Trend. The program completed follow up work on targets to the northeast of McA North (3) with no significant upgrading of those showings and began systematic drill testing of the P2 Trend to the southwest of the McArthur River deposit. Diamond drilling consisted of 23 inclined drill holes and directional off-cuts for a total of 11,989 m. Low grade mineralization (0.61% U_3O_8 / 13.4 m) was encountered 600 m southwest of the mine workings. Systematic 200 metre-spaced drill tests of the P2 structure were completed for 1.7 km southwest of the McArthur River deposit. Delineation drilling of Zone B with conventional and directional drill holes (13 holes / 6,355 m) was completed during Q4 2009.

Consecutive diamond drill programs in 2010 – 2011, continued the systematic drill testing of the P2 structure southwest of the McArthur River deposit. During this period, 35,940 m was drilled in 54 drill holes comprising a combination of conventional and directional drilling. Drill coverage of the P2 structure at 200 m step-outs was extended for 6.4 km southwest of the McArthur River deposit. Drill results from this period identified an anomalous uranium-in-sandstone halo coincident with the P2 Trend extending approximately 2 km grid southwest of the P2 North deposit. Low grade mineralization highlighted by 0.91% U_3O_8 / 22.8 m and 0.47% U_3O_8 / 18.1 m has been sporadically intersected coincident with the P2 structure in this area. Select targets within and proximal to the McArthur River deposit were also drill tested during these programs, but failed to significantly upgrade this sub-economic deposit. The 2010 – 2011 drill results have improved understanding of the structural architecture of the P2 Trend southwest of the McArthur River deposit. Aspects of the P2 structure and offsetting faults have been identified which will require further investigation. Ground geophysical surveys consisting of stepwise Moving Loop TDEM (2010) and Pole-dipole resistivity (2011) were carried out in the Harrigan area.

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 13.75 km on the McArthur River property, but has only been adequately tested from surface for approximately 11.5 km leaving 16% of this highly prospective trend untested or under tested. In addition, positive drill results encountered over the last several years have identified sections of the defined P2 Trend which warrant more detailed evaluation. Potential remains for additional uranium mineralization both northeast and southwest along strike of the P2 Trend.

The focus for surface exploration drilling is now two-fold: i) to continue with the systematic drill testing of the P2 fault structure southwest of the mine; and ii) to evaluate prioritized segments of the P2 structure, both northeast and southwest of the mine, with detailed follow-up drilling. The 2012 surface exploration program contemplated 26 drillholes with approximately 17,000 cumulate metres of drilling.

Table 9-1: Summary of Surface Exploration at McArthur River 2000 – 2012

Year	Drilling			Airborne Geophysics		Ground Geophysics		Other Exploration
	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 magnetotellu rics	68 Stations	
2003	Core	2	1,299	Triaxial Gradiometer	1,176	Fixed Loop TEM	38.2	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, Drillcore logging and sampling
2007	Core	25	13,840	Triaxial Gradiometer	4,457	Fixed Loop TEM	332.6	Compilation, Historical drillcore logging and sampling
				Gravity	3,736	In-loop Soundings	3.45	
2008	Core	30	16,479	VTEM	1,261	Step Loop Transient EM	115.0	Drillcore logging and sampling
	Core	3	2,051					Shaft 4 pilot holes
2009	Core	23	11,989					Drillcore logging and sampling
	Core	13	6,365					Zone B delineation drilling

Year	Drilling			Airborne Geophysics		Ground Geophysics		Other Exploration
	Type	**No. Holes**	**Metres Drilled**	**Type**	**Line (km)**	**Type**	**Length (km)**	**Type**
2010	Core	32	21,136			Step Loop Transient EM	69.15	Drillcore logging and sampling
	Core	3	2,100					Shaft 4 pilot holes
2011	Core	22	14,804			Pole-Dipole Resistivity	45.0	Drillcore logging and sampling
2012(1)	Core	26	16,674			Step Loop Transient EM	39.0	
Total		**206**	**121,506**		**12,163**		**872.9**	

Note: (1) As at August 31, 2012.

9.4 Present Underground Exploration

See Section 10.2 for a discussion of underground exploration.

10 DRILLING

10.1 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. Drillhole deviation surveys were completed by Midwest using a Reflex EZ-SHOT™ instrument.

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

Hy-Tech Drilling Ltd. (Hy-Tech) of Smithers, British Columbia, carried out drilling operations from 2007 to 2009. Two skid mounted Tech-5000 drill rigs and ancillary equipment were utilized for these drill programs. Hy-Tech personnel completed drillhole deviation surveys using a Reflex EZ-SHOT™ instrument.

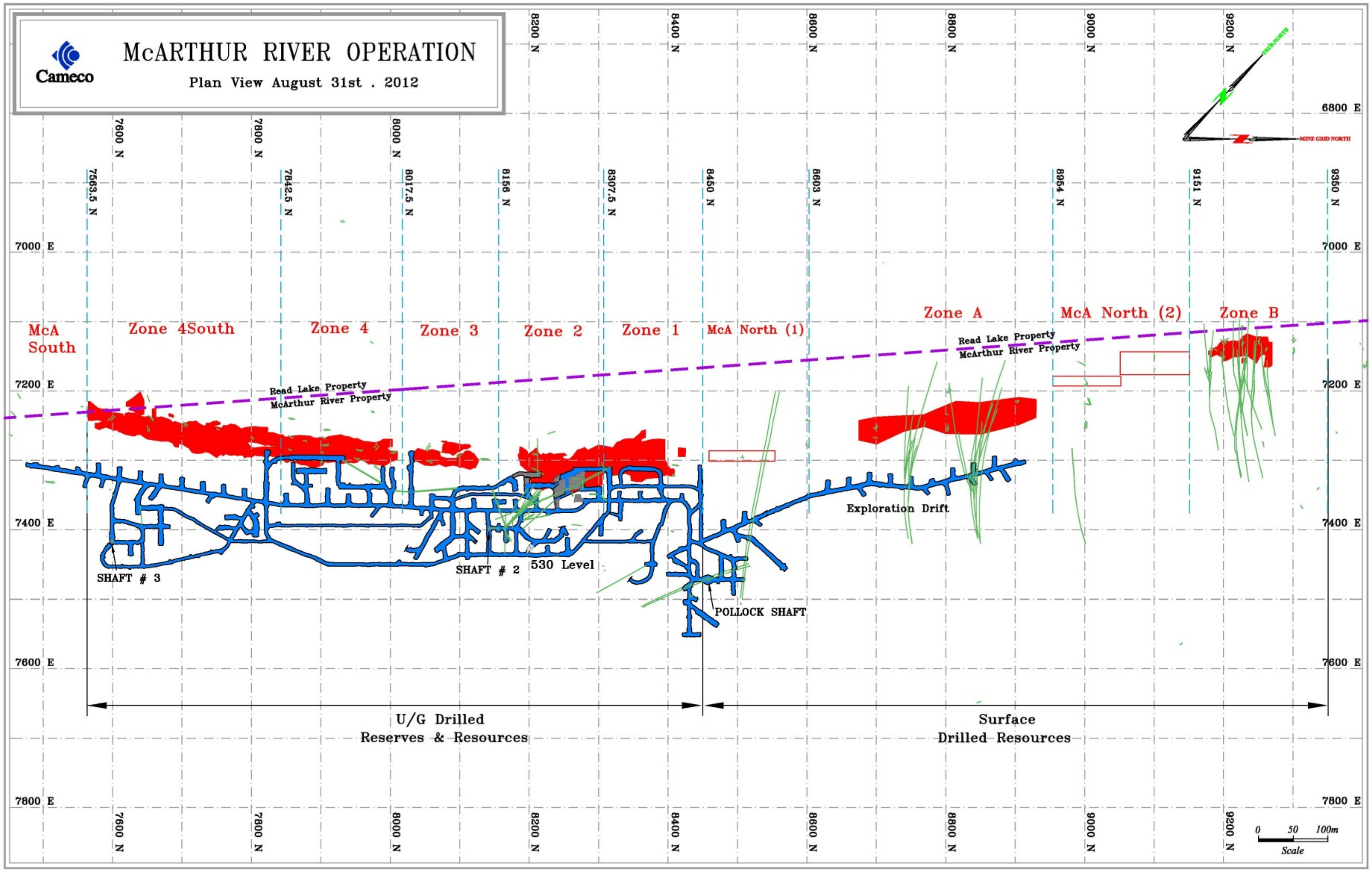
Major Drilling International (Major) of Winnipeg, Manitoba has completed drilling operations from 2010 to present. Two or three skid mounted Duralite 1000N drill rigs and ancillary equipment were utilized for these drill programs. Major personnel completed drillhole deviation surveys using a Reflex EZ-SHOT™ 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, which are located at the Saskatchewan Research Council Geoanalytical Laboratories (SRC) facilities in Saskatoon.

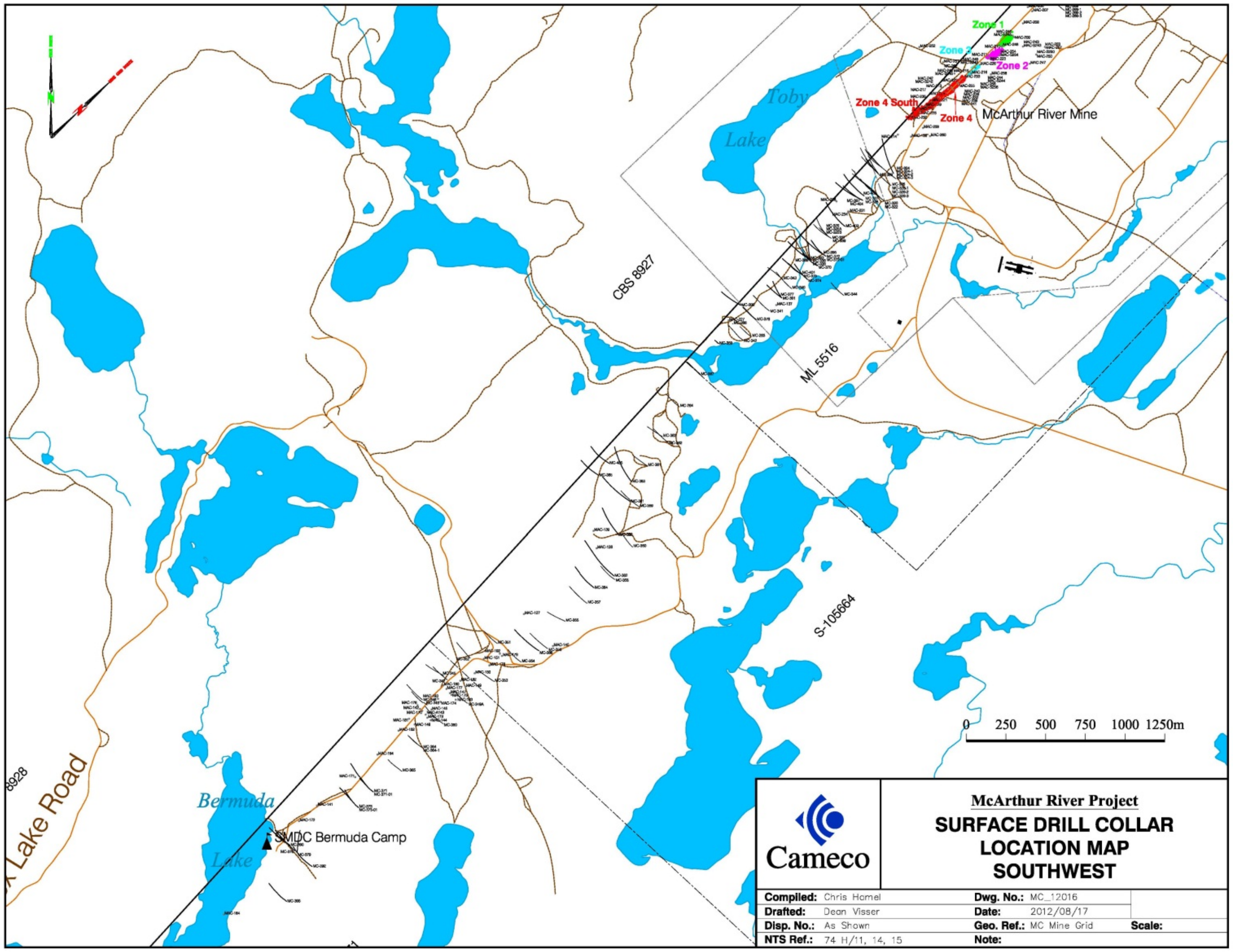
All drillhole locations are verified in the field by differential GPS or in the case of holes near the mine infrastructure by the mine site surveyors. A summary of surface drilling by year is shown in Table 10-1. Figure 10-1 indicates the location of the surface drilling in each area. The location of the surface drillholes in the southwest and northeast, respectively, is shown on Figure 10-2 and Figure 10-3. 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.

Figure 10-1: Map of Surface Drilling



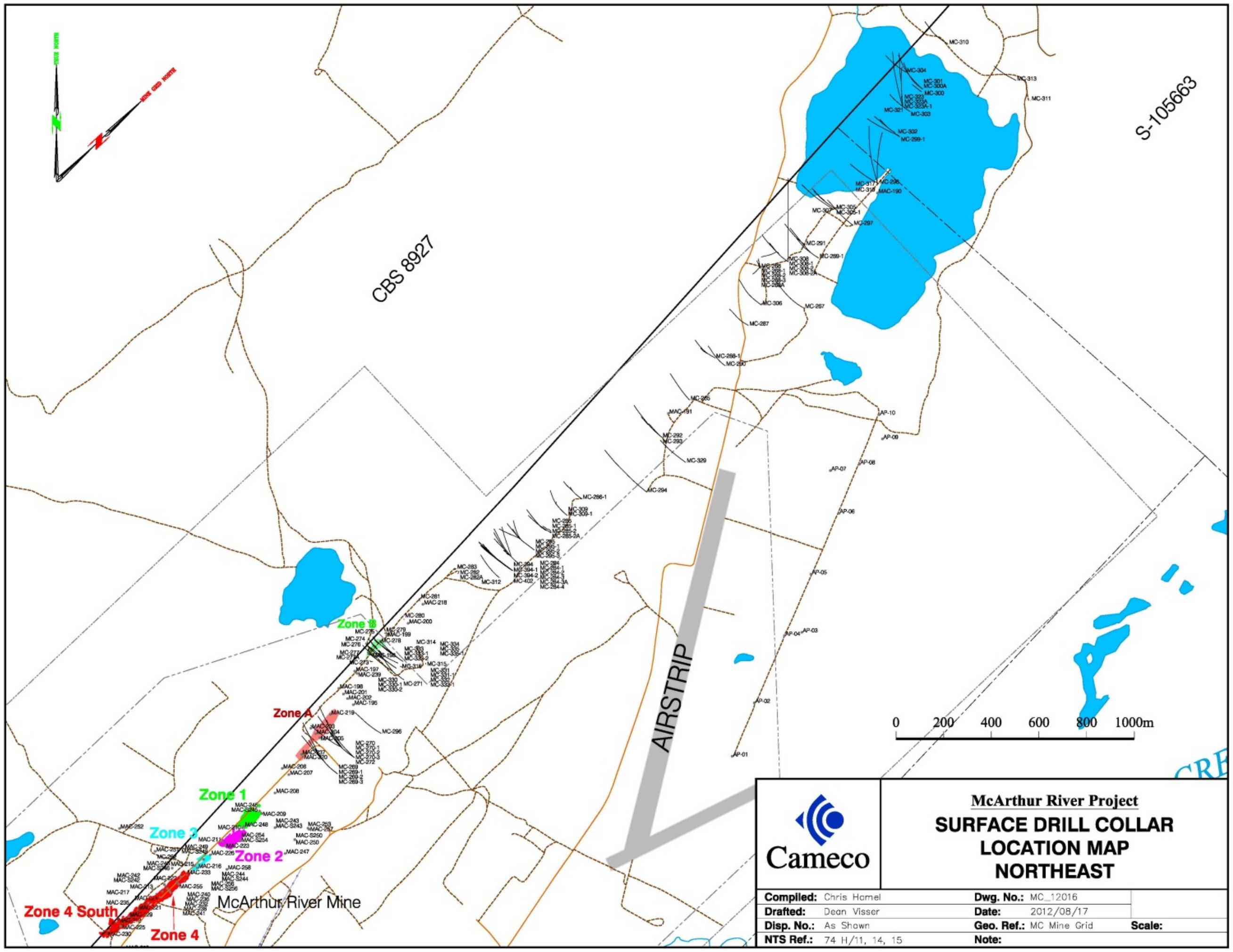
Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

Figure 10-2: Surface Drill Collar Location Map – Southwest



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

Figure 10-3: Surface Drill Collar Location Map – Northeast



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

Table 10-1: 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	5,361
2007	Cameco	25	13,840
2008	Cameco	30	16,479
2009	Cameco	36	18,354
2010	Cameco	32	21,136
2011	Cameco	22	14,804
2012(1)	Cameco	26	16,674
Totals		**496**	**242,155**

Note: (1) As at August 31, 2012.

10.2 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.

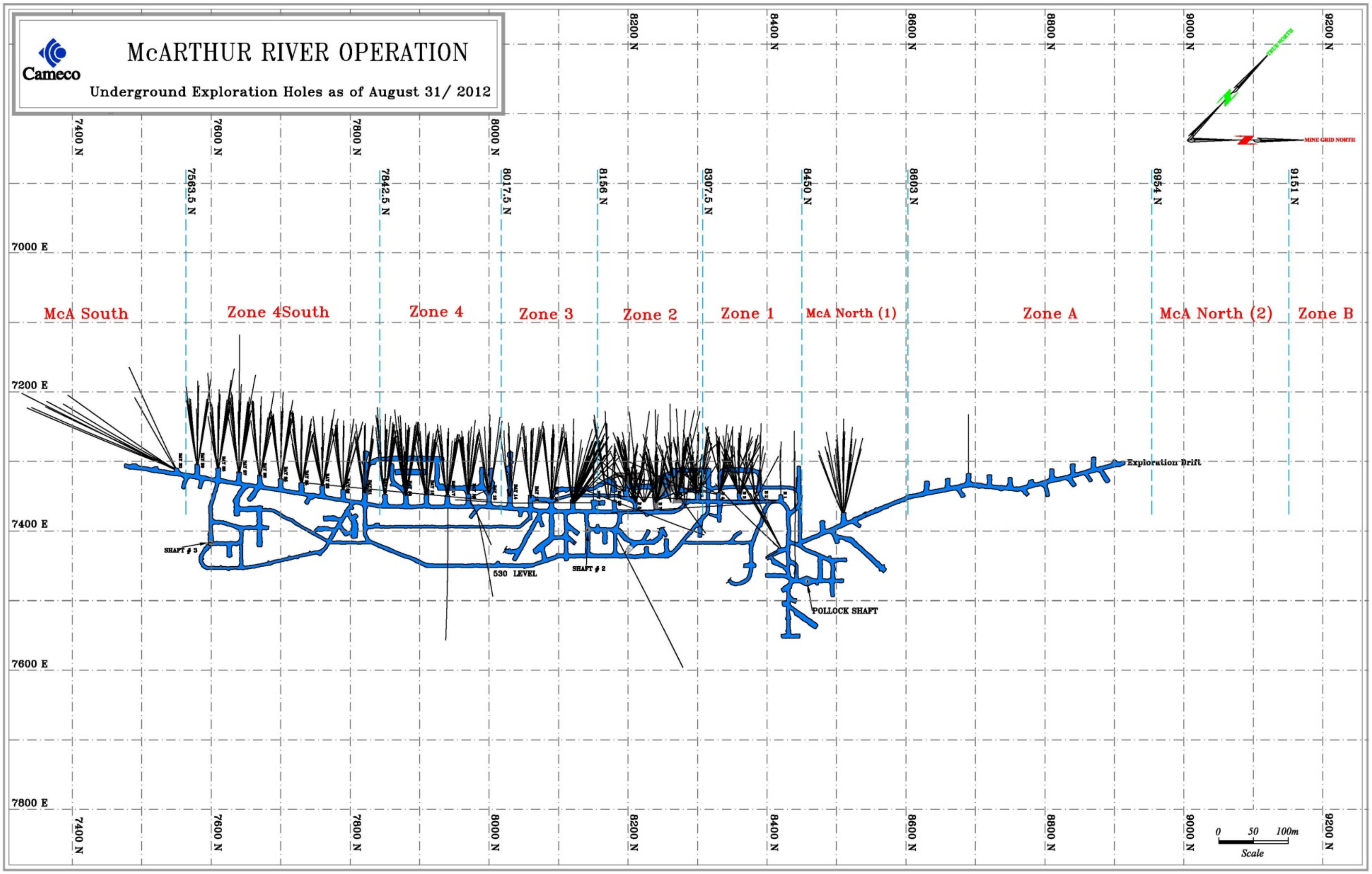
As a result, the concept of drilling 'under pressure', to duplicate surface drilling conditions, was proposed. N. Morissette of Haileybury, Ontario designed the necessary equipment to drill under pressure and since then virtually all of the drilling at McArthur River has used this collar security as 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 950 m, between 7570N and 8520N (see Figure 10-4), although a few sections at the extreme north end still require some additional fill-in drilling. A drill has just begun delineation drilling on Zone A. Underground development is advancing towards Zone B for future delineation drilling. The majority of the delineation drilling has been accomplished from 30 m spaced drill bays excavated on the northwestern side of the main drift on the 530 m level. Each drill bay would have one fence of holes drilled directly west (on the mine grid), followed by fences that are angled just to the north and just to the south (on the mine grid), ultimately resulting in three, 10 m spaced sections through the orebody. Hole spacing within each section is targeted to be 10 m, at the expected mineralized intersection. Each fence delineates the mineralization with hole angles ranging from +45° to -70° .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. In a few instances, in-fill delineation drilling has been carried out from locations in the mine other than the 530 m level drill bays. Exploration delineation holes have been completed from locations on the 560 m level, 580 m level, and the 640 m level.

Underground exploration drilling and development is continuing to take place in 2012. Programs have been completed on the fringes of Zone 2 and on McA North (1). Review and interpretation of the results are pending. A program has been partially completed on the fringes of Zone 3 and depending on availability of drills, is expected to be continued in the future. One drill is currently active at the southwest end of Zone A.

Figure 10-4: Map of Underground Drilling



Notes: (1) Green North arrow indicates true North.
(2) Red North arrow indicates mine grid North.

10.3 Core Logging – Underground Diamond Drilling

The drill core is systematically logged, photographed, and racked outdoors. Drillhole data is entered into a geological database. Cross sections are generated and interpretations are 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 10 cm intervals until the end of the box and the readings are marked in the drilling log as well as on the box.

Geotechnical Log:

Geotechnical logging assigns a visual rock competency value to the drill core. Whenever the rock competency changes the interval and assigned value is 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 held for sampling, if warranted, and then 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.

10.4 Core Logging - Exploration Surface Drilling

Logging of drill core from surface drills on the McArthur River project begins with geotechnical work. A technician measures and labels core box depths from the run markers provided by the drill crew, measures and enters the RQD (Rock Quality Designation) to characterize fractures, breaks, and total recovery in each 3 m segment of core. The technician also generates the core orientation marks on the core from the ACT orientation tool. The data collected by the technician is entered into DH Logger running on a tablet or netbook PC. This data is then synchronized with the geologic data collect by the geologist by the Fusion Client application.

A geologist examines the core to determine the lithologic characteristics; including lithology, alteration, structure, and mineralization. Geologic data is collected in the DH Logger logging interface and synchronized with the data collected by the technician by the Fusion Client application. The geologic data is catalogued in perpetuity in a database.

Following geological logging, the core is systematically photographed. This data, along with the down hole radiometric, and other ancillary data is catalogued and backed up on Cameco's network. At this point, the sampling is completed, if warranted, and the core is then temporarily stacked near the exploration core logging facility until it is moved to a permanent core storage facility at Bermuda Lake, located 7.5 km from the McArthur River Operation.

10.5 Cementing of Surface Diamond Drillholes

After a diamond drillhole 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, 63 surface drillholes that were anticipated to come within 50 m of projected future mine workings, have been fully cemented to surface.

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

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

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sample Density and Sampling Methods

Surface holes are generally drilled on sections spaced at between 50 and 200 m with 12 m to 25 m between holes on a section where necessary. The surface drillhole spacing is illustrated on Figure 10-2 and Figure 10-3 in the previous section. Underground delineation drilling is performed on a 10 m by 10 m grid spacing in the plane of the mineralization. The underground drillhole spacing is represented on Figure 10-4 and on Figure 11-1.

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 aluminum 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 drillholes 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 is sampled.

Since 2010, multi-element assaying of underground exploration drillholes has become more common place. One or two drillholes from almost every 10 m spaced drill section are selected and sampled for analysis. The intent is to build a database of multi-element assay data that will contain enough information to model a variety of elements. A 3D model could then be generated that might reasonably predict when mining operations would intersect a portion of the orebody with an anomalous concentration of specific (deleterious) elements such as molybdenum. This information could then be passed on to milling and water treatment operators.

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: weight 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 are shipped to the SRC laboratory in Saskatoon under the Transportation of Dangerous Goods regulations. The laboratory results are then added to the database.

11.2 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 drillholes, 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.

11.3 Sample Quality and Representativeness

The quality and representativeness of the surface drillhole 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.

Prior to 2010, very few underground drill samples were analyzed because a gamma probe was able to be used to determine the grade in the hole. 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 drillhole fans provide representative access for the gamma probes across the entire deposit. As noted in Section 11.1, sampling is more routine now than it was prior to 2010. When assay data is available, it is always used instead of the gamma probe value, unless core recovery was poor, in which case the probe data would be preferred.

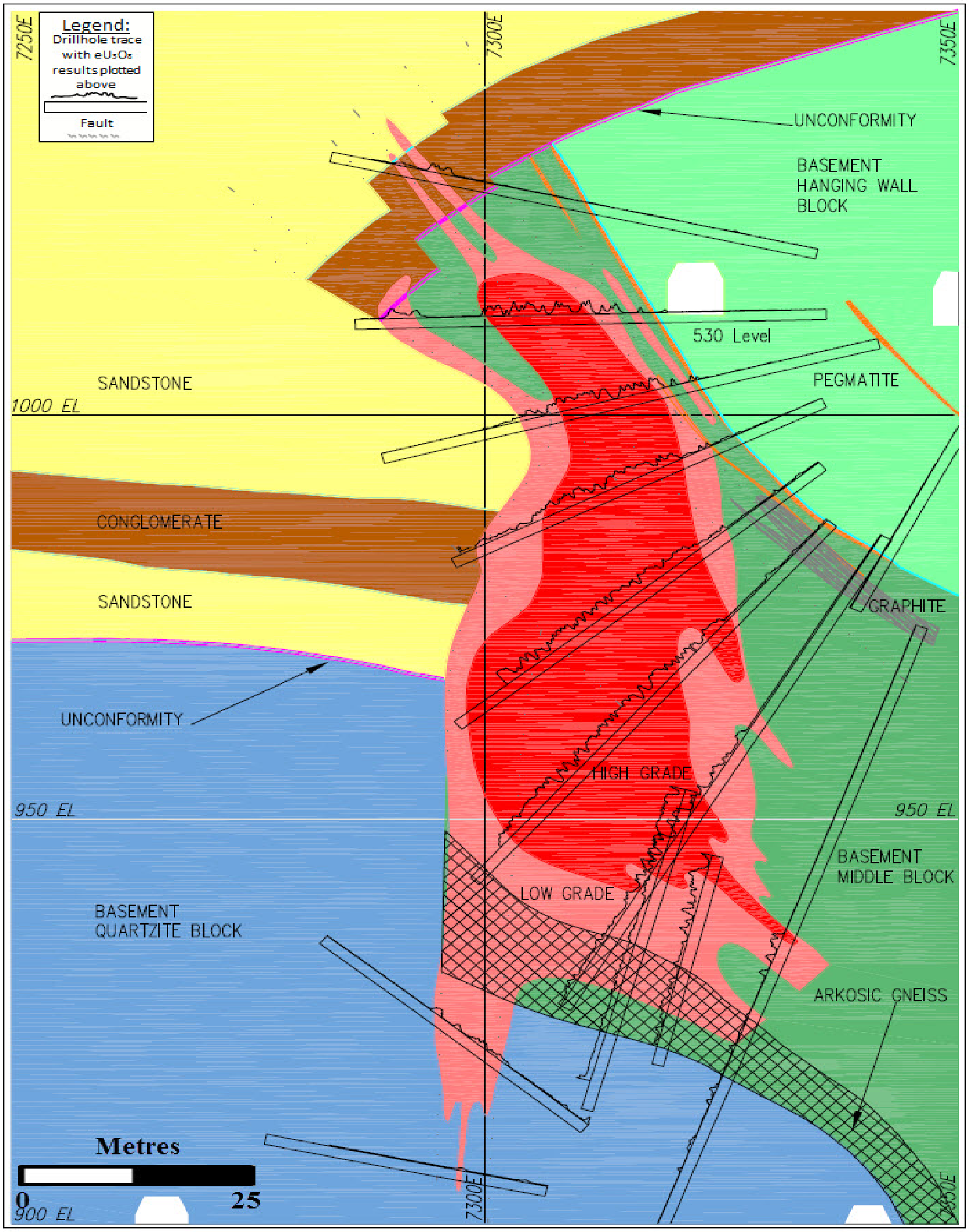
When physical samples are collected as a result of the inability to insert the gamma probe, whole core is used. This provides very high-quality samples in those areas.

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

11.4 Estimated True Widths

In general, the edges of the mineralized zones exhibit very sharp boundaries with non-mineralized host rock. Vertical surface holes generally intersect the mineralization at angles of 25° to 45°, resulting in true widths being about 40% to 70% of the drilled width. Underground drillholes 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 11-1 illustrates the underground drillhole traces on a vertical section with their profiles of radioactivity and interpreted faults. Existing mine openings are shown in white.

Figure 11-1: Typical Underground Drillhole Spacing - Section Looking Northeast



Source: Cameco

11.5 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.

11.6 Sample Preparation

11.6.1 Introduction

All samples collected from McArthur River for determining uranium content by chemical analysis and used in the Mineral Resource and Reserve estimates were sent to SRC for analysis. It should be noted however that a few of the earlier surface drillholes had their samples sent to another laboratory 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 drillholes 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 laboratory to complete the analysis. Only SRC 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).

11.6.2 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.

11.6.3 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 11-2).

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.

11.6.4 Sample Preparation

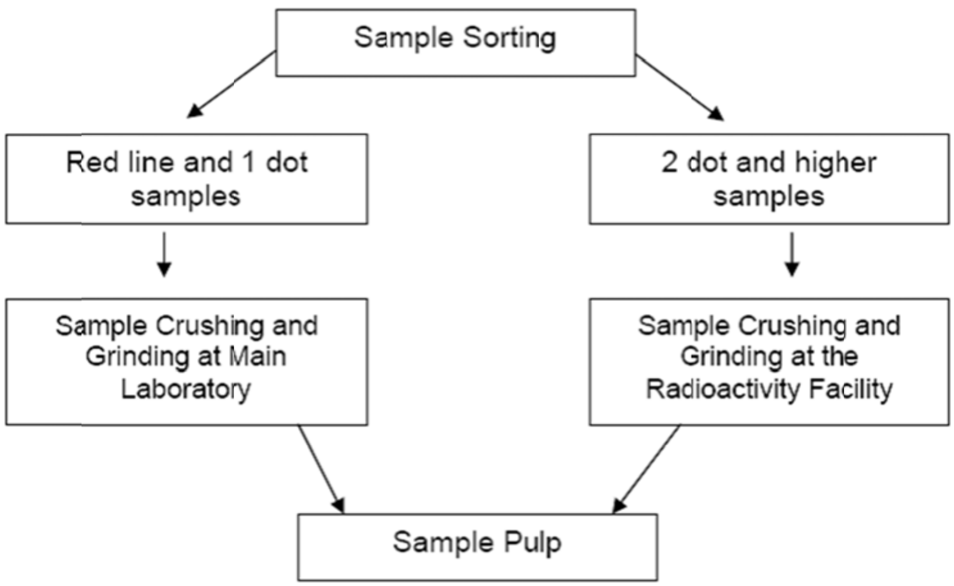
All samples are dried. After the drying process is completed, “Red line” and “1 dot” samples are sent for further processing (crushing and grinding) in the Main Laboratory. This is done in the SRC basement preparation area. All radioactive samples at “2 dots” or higher (2000 counts/second or greater) are sent to the secure SRC Radioactive 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 Radioactive 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% @ -2 mm and 100-200 g 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 11-2: Schematic of Sample Preparation Procedures



11.6.5 Summary of Licences, Certifications and Registrations

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

Safety is a paramount concern at SRC. 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.

11.7 Assaying

Assaying of drillcore is performed at SRC's Main Laboratory. An aliquot of pulp is digested in a 100 ml 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.

11.8 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 are producing are 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 drillhole, 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, although with newer equipment, most data collected is now at 10 cm intervals. The data is 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 relatively low, but has a 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 drillhole, including the mineralized zone.

Gamma data is then processed with software that accounts for the calibration (K) factor for the instrument, drillhole 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 is ultimately used as the basis for the resource and reserve estimation where assay data is unavailable.

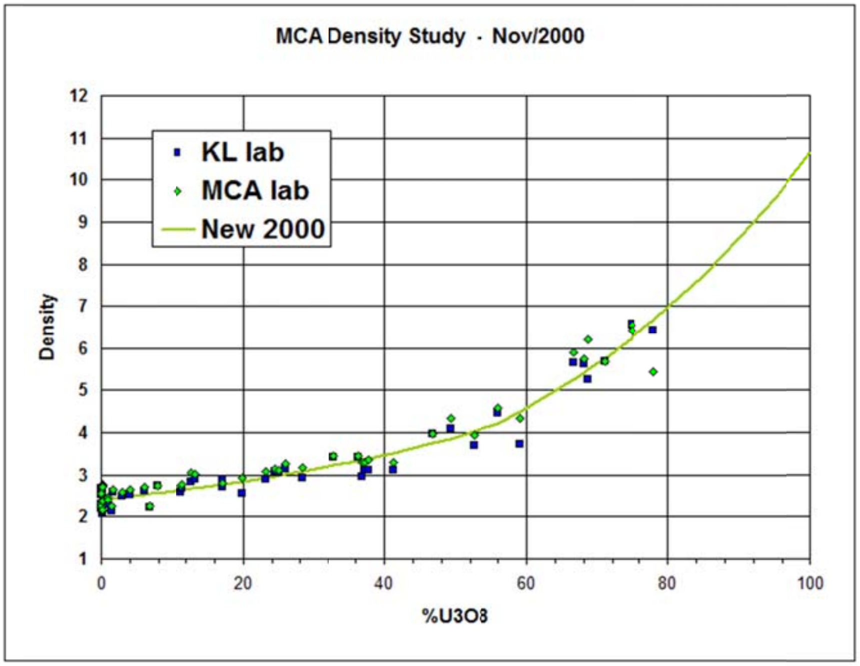
At the beginning of the underground exploration program, several holes were selected and sampled for uranium analyses, in order to verify the results from the gamma processing. The holes that were selected had to have excellent core recovery so that the entire interval could be sampled. The sampling 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.

11.9 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 is summarized in Figure 11-3. Density was measured at Cameco's Key Lake laboratory (KL lab in Figure 11-3) and at McArthur River laboratory (MCA lab in Figure 11-3), 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 11-3 represents the equation used since that time.

The reconciliation of mine production with the Mineral Reserves model indicates that the tonnage of ore and therefore density, are very well established (See Table 15-1).

Figure 11-3: Density Summary



11.10 Quality Assurance/Quality Control (QA/QC)

11.10.1 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 Cameco'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 11-1 summarizes the identity and number of materials analyzed in a typical batch of 40 samples.

Table 11-1: 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 laboratory 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 laboratory 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 laboratory 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 by plotting results with respect to project and year.

11.10.2 Underground Drilling

QA/QC for underground drillhole information is focused on quality probing results. This is ensured by Cameco employees 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.

Weekly tests are also carried out with each probe in two fixed radioactive sources. The results must fall within an accepted range for each probe in order for that probe to remain in service. 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 Cameco's corporate office.

Assay data for the SRC standards and for the duplicate samples is compiled in an Access database. The data is periodically graphed and checked to ensure that there have not been any results that fall outside of accepted limits.

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

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

Assaying was done with industry standard procedures and the QA/QC procedures employed by the laboratories are adequate.

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. Reconciliation of the model to production 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.

Sample security is largely defined by regulation and all samples have been stored and shipped in compliance with regulations.

The qualified person for this section is satisfied with all aspects of sample preparation and assaying. The qualified person believes that the sample security was maintained throughout the process.

12 DATA VERIFICATION

The drillhole database, containing information from surface and underground drillholes used to produce the Mineral Resource and Mineral 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 down hole deviations were entered in the database and displayed in plan views and sections to visually compare against the planned hole locations;
- 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 freezeholes, raisebore pilot hole probing, radiometric scanning of scooptram buckets and mill feed sampling, are regularly compared to the drillhole data; and
- Since 2011, a formal QA/QC check of data is completed before any drillhole data is used for Mineral Reserve estimation purposes.

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

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

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 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 15% 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.

For a more detailed discussion of mineral processing see Section 17.

13.2 Processing at McArthur River

13.2.1 Metallurgical Testwork

Ore processing at McArthur River was commissioned in 2000 following a lengthy period of testing, design, procurement, and construction. The flowsheet, which is described further in Section 17.2, 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 (SAG) 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.

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

- Laboratory 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. This was completed in late 2009. 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.

13.3 Processing at Key Lake

13.3.1 Metallurgical Testwork

An extensive program of bench scale testwork was completed at the Key Lake metallurgical laboratory on representative samples of 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 2011, overall uranium recovery to the final calcined yellowcake product averaged 98.7%.

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 rock and is one of the components used to blend down the feed grade of the slurry to a nominal 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. 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.

A gravity concentrator circuit was installed in 2008 within the existing crushing and grinding plant to reject a majority of the concrete to tailings while concentrating the uranium from the mineralized waste rock before adding this to the mill feed blend. Also, other improvements were made to allow an increase in the allowable amount of concrete in the mill feed. Operating procedures in the solvent extraction process were modified to minimize the potential for phase inversion when excessive crud formation is present. In addition, a hydrogen peroxide circuit was installed in the mill bulk neutralization process to effectively remove any residual organic from the treated water prior to release. Recent testwork has shown that Vibratory Shear Enhanced Processing (VSEP) can be used to remove fine colloidal silica particles contained in the feed to solvent extraction. This filtration step has the potential to significantly reduce crud formation. Further tests are planned to confirm if this solution pre-treatment step is feasible.

The original Key Lake milling facilities and related infrastructure have been in service for nearly 30 years. In late 2006, Cameco initiated a strategic plan to revitalize the Key Lake facilities in order to ensure that the mill would be able to process McArthur River's Mineral Reserves for the next thirty years. The Key Lake revitalization plan is discussed in more detail in Section 17.4.

To date the following metallurgical testwork has been completed in conjunction with the Key Lake revitalization plan:

- two separate pilot scale programs at Key Lake testing Bateman pulsed columns for the replacement of conventional mixer-settlers in the solvent extraction process;

- a bench scale program at Rabbit Lake testing Harwest membrane based acid recovery technology from loaded strip solution produced by the strong acid stripping process;
- bench scale testing at Rabbit Lake of RPA Process Technologies vacuum belt filtration performance on gypsum from the impurity precipitation process;
- pilot-scale program at Rabbit Lake testing the properties of yellowcake produced by drying over a range of temperatures;
- pilot-scale program at Cameco's Port Hope Research facility to quantify the processing benefit of the acid stripping process over the ammonia stripping process for concrete-laden ore;
- pilot scale program at the Key Lake mill to compare performance of an acid stripping process to the existing ammonia stripping process. A decision was made to retain the current ammonia stripping since operating both processes in parallel with the same feed showed similar performance of solvent extraction;
- bench-scale program at Cameco's Port Hope Research facility to determine the expected properties of Key Lake tailings produced by the strong acid stripping process;
- bench-scale testing to determine the expected effect of impurities (largely gypsum) precipitated out;
- pilot-scale program at Rabbit Lake testing VSEP membrane based acid recovery technology from loaded strip solution produced by the strong acid stripping process; and
- testwork was conducted on elevated product drying temperatures and ozone as a replacement oxidant for hydrogen peroxide in the bulk neutralization circuits.

Cameco expects the ongoing test programs to find ways to improve operational performance, including VSEP testing on pregnant aqueous feed to solvent extraction to confirm how the reject silica stream will be disposed of.

14 MINERAL RESOURCE ESTIMATES

Nine distinct mineralized areas have been identified at the McArthur River deposit. Five of these have been well defined with underground drilling, namely Zones 1, 2, 3, 4 and 4 South. The remaining four, McA North (1), McA North (2), Zone A and Zone B, are based entirely on surface drilling. McA North (1) has recently experienced underground drilling (results pending). Underground drilling was recently started on Zone A and is ongoing. For reporting purposes, the McA North (1) and McA North (2) Mineral Resource estimates are combined and referred to as McA North.

Two under-explored mineralized showings, known as McA North (3) and McA South, as well as other mineralized occurrences, will be followed up on if warranted.

The data derived from diamond drillholes have been interpreted to yield estimates of Mineral Resources for the McArthur River deposit. In addition to this drilling, hundreds of freezeholes and raisebore pilot holes have provided additional data supporting the interpretations. A portion of these freezeholes were utilized in the Zone 1 Mineral Resource and Reserve estimate.

14.1 Definitions

The McArthur River Mineral Resource estimates have been updated and reviewed by Cameco. Peer reviews have been conducted internally. No independent verification of the current Mineral Resource estimates has been performed.

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

14.2 Key Assumptions, Parameters and Methods

14.2.1 Key Assumptions

The key assumptions used in the Mineral Resource estimates for McArthur River are:

- continuity of quality and quantity of uranium mineralization exists between sampled areas.
- reported Mineral Resources do not include allowances for dilution or mining recovery.
- diamond drilling, ground support systems, and mining plans mitigate the risks associated with potentially adverse ground conditions.

- water control measures are effective at preventing water inflow.
- radiation protection measures in place continue to be effective.

14.2.2 Key Parameters

The key parameters used in the Mineral Resource estimates for McArthur River are:

- for Mineral Resources estimated only by surface drillholes, the uranium grade is determined from assay samples.
- for Mineral Resources estimated from underground drillholes, grades were obtained from assay samples, where available, or by converting radiometric probing values to e%U_3O_8 based on a correlation between radiometric counts and assay values.
- densities were determined using regression formulas based on density measurements of drill core and chemical assay grades.
- limits and continuity of the mineralization are structurally controlled.
- Mineral Resources are estimated at a minimum mineralized thickness of 1.0 m and a minimum grade of 0.1% to 0.5% U_3O_8 assuming extraction by underground mining methods.

14.2.3 Key Methods

Known mineralization at McArthur has been divided into Zones 1, 2, 3, 4, 4 South, A, B, and McA North. The latter is a combination of McA North (1) and McA North (2) for reporting purposes. These zones of mineralization cover an area approximately from grid northing 7563N to grid northing 9270N, as illustrated in Figure 10-1.

The two and three-dimensional triangulations created for each zone of mineralization were utilized to constrain the block model. Variograms of two to three variables, DG (density x grade), D (density) and, in some cases, U_3O_8 grade, were calculated using Sage 2001 variography software for each zone that utilized kriging interpolation. Each block was assigned a DG and D value from which the grades that were used for the Mineral Resource and Mineral Reserve estimates were calculated (grade = DG/D). These values were assigned to each block from ordinary kriging or inverse distance squared, depending on the zone as detailed below. In some cases, U_3O_8 grade was also estimated independently for comparative purposes.

Mineral Resources, based solely on the pre-1993 surface drilling, were estimated with the two-dimensional cross-sectional method on vertical sections at 50 m or 100 m spacing using Autodesk Generic CADD software. The Mineral Resource estimate for McA North was produced in 1995 and is still considered a good representation of the mineralization. McA North (1) has recently undergone underground definition drilling, however the Mineral Resource estimate has yet to be updated to account for this.

Mineral Resources estimates for Zones A and B, where additional holes were drilled from surface since 2004, were estimated using three-dimensional models. Wireframe models were created from the geological interpretation of mineralization outlines using lithology, structure and uranium grade information. The interpretation was done on 25- or 50-metre spaced vertical cross-sections for Zone A and generally 5-metre spaced for Zone B before being validated on plan views.

Using the Gemcom GEMS software, a Zone A estimate of the variables DG and D were obtained with the inverse squared distance method for blocks of 5 m E-W x 10 m N-S (on the mine grid) x 2 m vertical. Estimates were based on 1 m composites selected within an search ellipsoid with radii of 30 m in the plane of the mineralization and 10 m perpendicular to it. Given the spacing between holes, a few composites with high grade values (above 20%) had their area of influence reduced to 10 m (Cameco, 2008e). The Mineral Resources for Zone A are classified as Inferred. Zone A is currently undergoing additional drilling from underground.

Using Vulcan software, Zone B estimates of the variables of U_3O_8 grade, D and DG were obtained with the ordinary kriging method, for main zone domains and inverse distance squared on pod outliers, for blocks of 5 m x 5 m x 2 m in size. Sub-blocking was also conducted on a 2.5 m x 2.5 m x 1 m basis as it gave the best volume comparison to the wireframes. Estimates were completed on 1 m composites selected within a search ellipsoid with radii of 23 m in the plane of mineralization, 15 m in the semi-major axis, and 12 m in the minor axis for the main zone of mineralization. The five outlier pods were also estimated on 1 m composites within search ellipsoids ranging with a radii of 10 – 20 m in the major axis, 7.5 m – 15 m in the semi-major axis, and 5 m – 10 m in the minor axis. To further restrict the high grade component, Zone B main was split into high (values above 12%) and low grade domains (Cameco, 2011b). The Mineral Resources for Zone B are classified as Indicated for the Main Zone and Inferred for the five outlier pods.

Mineral Resources in Zones 1, 2, 3, 4 and 4 South are delineated by underground drillholes and estimated using three-dimensional models. Wireframe models were created from the geological interpretation of mineralization outlines using lithology, structure and uranium grade information. The interpretations were done on 10 m spaced vertical cross-sections and plan views.

Zones 2, 3 and 4 estimates of the grade and density in blocks 1 m x 5 m x 1 m in size were obtained from ordinary kriging or inverse distance squared methods using the Gemcom GEMS software. Each block was estimated with D and DG values. The small block size was selected to better conform to the mineralization limits and the relatively small size of the excavations. Search distances were 30 m in the plane of the mineralization and 10 m perpendicular to it. No cutting of high uranium values was necessary given their continuity identified at a drill density of 10 m by 10 m.

The Zone 1 estimate of grade and density was conducted on 1 m composites, using Vulcan software, on blocks sized 1 m x 5 m x 1 m with ordinary kriging interpolation, where each block was estimated with U_3O_8 grade, D and DG values. The small block size was selected to better conform to the mineralization limits and the relatively small size of the excavations. Search distances, in the plane of mineralization, were 15 m in the major axis, 15 m in the semi-major axis and 5 m in the minor axis. No cutting of high uranium values was necessary given their continuity identified at a drill density of 10 m by 10 m. Estimates were compared between kriged, inverse distance squared, nearest neighbour, and density weighted composite values (Cameco, 2011).

The Zone 4 South estimate of grade and density was conducted on 1 m composites, using Vulcan software, on blocks sized 3 m x 3 m x 3 m with ordinary kriging interpolation, for the main zone of mineralization. Inverse distance squared was utilized for the outlier and perched sandstone mineralization. Each block was estimated with U_3O_8 grade, D and DG values. Sub-blocking was conducted down to 1 m x 3 m x 1 m, as this conformed to the drillhole spacing and raisebore size. Search distances varied by area as well as interpolation run as detailed in Table 14-1. No cutting of high uranium values was necessary given their continuity identified at a drill density of 10 m by 10 m. Estimates were compared between kriged, inverse distance squared, nearest neighbour, and/or density weighted composite values (Cameco, 2012a).

Table 14-1: Summary of Zone 4 (South) Mineral Resource Search Ellipses

Zone	Area	Run No.	Ellipses Major Axis (m)	Ellipses Semi-Major Axis (m)	Ellipses Minor Axis (m)
Zone 4 (South)	Main - Upper	1	21	8	5
		2	21	15	5
	Main - Lower	1	29	17	6
	Outliers	1	15	15	5
	Pods	1	30	30	10

Block models were validated using various estimation methods and parameters. This included comparing, where available, the DG/D grade to the U_3O_8 grade as well as the different interpolation methods to each other. However, the most important validation comes from the reconciliation of the mine production with the Mineral Reserves model over the years (See Table 15-1).

14.3 Mineral Resource Classification

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

Measured Resources: Drillhole spacing approaches 10 m by 10 m in the plane of the mineralization and the level of confidence on the interpretation and the grade continuity is high.

Indicated Mineral Resources: Drillhole spacing approaches 30 m by 10 m and additional information may affect the interpretation and the assumed continuity of the grade.

Inferred Mineral Resources: Drillhole spacing is greater than 30 m by 10 m and the level of confidence on the interpretation and the continuity of the grade is low.

The Mineral Resource estimates are based on approximately 50 mineralized drillholes from surface, 650 mineralized drillholes from underground and 20 mineralized freezeholes.

The McArthur River estimated Mineral Resources, with an effective date of August 31, 2012, are presented in Table 14-2. Alain G. Mainville, P.Geo., of Cameco, is the qualified person within the meaning of NI 43-101 for the purpose of the Mineral Resource estimates.

Table 14-2: Summary of Mineral Resources – August 31, 2012

Category	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Measured	68.6	5.53	8.4	5.8
Indicated	15.5	9.97	3.4	2.4
Total Measured and Indicated	**84.1**	**6.35**	**11.8**	**8.2**
Inferred	325.0	7.86	56.3	39.3

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 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 legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

A breakdown of the Mineral Resource estimates by zone as of August 31, 2012 is shown in Table 14-3.

Table 14-3: Mineral Resources by Zones – August 31, 2012

Category	Area	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Resources					
Measured	Zone 1	3.3	4.69	0.34	0.24
	Zone 2	44.1	4.91	4.78	3.34
	Zone 3	1.1	3.90	0.09	0.07
	Zone 4	3.5	26.49	2.06	1.44
	Zone 4 South	16.5	2.97	1.08	0.75
	Total Measured	**68.6**	**5.53**	**8.36**	**5.83**
Indicated	Zone 1	6.3	15.73	2.19	1.53
	Zone 2	5.7	7.65	0.96	0.67
	Zone B	3.5	3.44	0.27	0.19
	Total Indicated	**15.5**	**9.97**	**3.41**	**2.38**
Total Measured & Indicated		**84.1**	**6.35**	**11.77**	**8.21**
Inferred	Zone 4 South	2.2	2.35	0.11	0.08
	Zone A	255.6	8.19	46.15	32.21
	Zone B	12.0	23.87	6.33	4.42
	McA North	55.3	3.06	3.73	2.60
Total Inferred		**325.0**	**7.86**	**56.31**	**39.31**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 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 legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

The updated 2012 Mineral Resource estimates reflect changes mainly due to:

- development of a new mine plan for Zone B and the corresponding reclassification of most of the 2011 Mineral Resources from Zone B into Probable Mineral Reserves; and
- updated resource estimate and mining plan for Zone 4 South, encompassing the former McA South Mineral Resource.

The summary of the changes in Mineral Resources is shown in Table 14-4.

Table 14-4: Changes to Mineral Resources

	Year-end 2011			August 31, 2012			Changes	
Category	**Total tonnes (x 1000)**	**Grade % U_3O_8**	**Total Mlbs U_3O_8**	**Total tonnes (x 1000)**	**Grade % U_3O_8**	**Total Mlbs U_3O_8**	**Total Mlbs U_3O_8**	**Cameco's Share Mlbs U_3O_8**
Measured	73.7	5.58	9.1	68.6	5.53	8.4	- 0.7	- 0.5
Indicated	114.4	25.40	64.0	15.5	9.97	3.4	- 60.6	- 42.3
Total Measured and Indicated	**188.1**	**17.63**	**73.1**	**84.1**	**6.35**	**11.8**	**- 61.4**	**- 42.8**
Inferred	405.2	9.67	86.4	325.0	7.86	56.3	- 30.1	- 21.0

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Reported Mineral Resources do not include amounts identified as Mineral Reserves. Totals may not add up due to rounding.
(2) Cameco's share is 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 legally or economically. It cannot be assumed that all or any part of the Inferred Mineral Resources will ever be upgraded to a higher category.

14.4 Discussion on Factors Potentially Affecting the Mineral Resource Estimates Materially

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

The McArthur River drilling database is considered to be reliable. Any potential errors which may be present are not expected to cause any significant changes to the Mineral Resource model. This is supported by the annual reconciliation of the mine production to within on average 5% of the estimate of pounds of uranium for the last five calendar years as shown in Table 15-1.

15 MINERAL RESERVE ESTIMATES

15.1 Definitions

The McArthur River Mineral Reserve estimates have been updated and reviewed by Cameco. Internal peer reviews have been conducted. No independent verification of the current Mineral Reserve estimates was performed.

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

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

15.2 Key Assumptions, Parameters and Methods

The key assumptions, parameters and methods used to convert Mineral Resources into Mineral Reserves are:

- Mineral Reserves include provisions for dilution (~20%) from backfill and mineralized waste mined and mining recovery (97.5%).
- An average uranium price of US$61 per lb U_3O_8 was used with a US$1.00=Cdn$1.00 fixed exchange rate (reflecting the exchange rate at August 31, 2012).
- Reported Mineral Reserves are not adjusted for the estimated mill recovery of 98.7%.
- Mineral Reserves are estimated based on raisebore, boxhole and blasthole stope mining methods, using freezewall protection.
- The cut-off is estimated at 5,000 lbs U_3O_8 per production raisebore hole at a minimum grade of 0.77% U_3O_8. The same cut-off grade is applied for boxhole boring and blasthole stope mining.

The McArthur River Mineral Reserves are not significantly sensitive to variances in the uranium price of plus or minus $20 provided that annual production remains above 10 Mlbs U_3O_8. The price assumption is based on independent industry and analyst estimates of spot prices and the corresponding long-term prices and reflects Cameco's committed and uncommitted sales volumes. For committed sales volumes, the spot and term price assumptions were applied in accordance with the terms of the agreements. For uncommitted sales volumes the same price assumptions were applied using a spot-to-term price ratio of 60:40.

Block models were validated using various estimation methods and parameters. The most important validation comes from the reconciliation of the mine production with the Mineral Reserves model over the years (See Table 15-1).

Table 15-1: Reconciliation of Production and Mineral Reserves (100%)

	Mine Production			Mineral Reserves Model			Percent Difference Production vs Mineral Reserves		
Year	**Total tonnes (x1000)**	**Grade % U_3O_8**	**Mlbs U_3O_8**	**Total tonnes (x1000)**	**Grade % U_3O_8**	**Mlbs U_3O_8**	**Tonnes**	**Grade**	**Lbs U_3O_8**
2000	43.7	11.6	11.174	34.2	9.8	7.354	28%	18%	52%
2001	48.0	16.2	17.166	48.3	14.2	15.117	-1%	14%	14%
2002	52.5	16.0	18.524	47.6	16.5	17.281	10%	-3%	7%
2003	45.4	15.2	15.243	40.9	12.4	11.227	11%	23%	36%
2004	55.9	15.2	18.699	60.4	13.1	17.345	-7%	16%	8%
2005	60.4	13.9	18.512	63.9	14.8	17.950	-6%	-6%	3%
2006	57.6	14.7	18.698	61.5	13.0	17.660	-6%	13%	6%
2007	59.6	14.2	18.718	67.0	12.1	17.851	-11%	17%	5%
2008	53.2	14.9	17.502	58.5	13.4	17.277	-9%	11%	1%
2009	65.2	12.9	18.530	61.2	12.2	16.481	7%	6%	12%
2010	78.0	11.3	19.341	63.3	14.7	20.470	23%	-23%	-6%
2011	80.2	11.2	19.732	83.8	9.5	17.618	-4%	18%	12%
2012(1)	58.9	10.5	13.691	64.5	11.6	16.477	-9%	-9%	-17%
Total(2)	**758.7**	**13.5**	**225.531**	**755.1**	**12.6**	**210.108**	**0%**	**7%**	**7%**
2007 to 2011(2)	336.2	12.7	93.820	333.8	12.2	89.697	1%	4%	5%

Notes: (1) As at August 31, 2012.
(2) Totals may not add up due to rounding.

Since the start of ore mining, production tonnes are within less than 1% of the model, uranium grade higher by 7% and pounds U_3O_8 higher by 7%. For the years 2007 to 2011, the reconciliation of mine production with the Mineral Reserve model is within on average 5% of the estimated pounds U_3O_8. Comparing the tonnage mined with the model during the same period, production is higher by 1% on tonnage and production grade is higher by 4%. The year-to-date variance is due to the overestimation of pounds of U_3O_8 in the model for a localized pocket of Panel 5, that is currently being mined, as well as along the fringe areas of Panel 5. The reason for most of the differences in tonnage and grade over the years is due to the fact that with the underground bucket scanner, the mine is able to sort some of the non-mineralized and non-contaminated dilution material extracted from the raises.

15.3 Mineral Reserve Classification

For Mineral Resources to be classified as Mineral Reserves, a viable and tested mining method and layout must be established with realistic allowances for recovery and dilution.

The Mineral Reserves classification follows the CIM definitions where economically mineable, Measured and Indicated Resources can be converted to Proven and Probable Reserves, but Inferred Resources cannot be reported as Mineral Reserves. An additional criterion is applied to reflect a degree of uncertainty on the modifying factor related to mining. All other modifying factors (metallurgical, economic, marketing, legal, environmental, social and governmental) are not expected to have an effect on the McArthur River Mineral Reserves. The boxhole boring mining method has been upgraded to a proven mining method based on successful test mining. This allowed the boxhole test ore to be upgraded from Probable to Proven Reserves.

The McArthur River estimated Mineral Reserves, with an effective date of August 31, 2012, are presented in Table 15-2 and Table 15-3. Alain G. Mainville, P.Geo., Gregory M. Murdock, P.Eng. and Leslie D. Yesnik, P.Eng., of Cameco are the qualified persons within the meaning of NI 43-101 for the purpose of the Mineral Reserve estimates.

Table 15-2: Summary of Mineral Reserves – August 31, 2012

Category	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Proven	384.4	23.81	201.8	140.8
Probable	677.8	12.30	183.7	128.3
Total Reserves	**1,062.2**	**16.46**	**385.5**	**269.1**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Totals may not add up due to rounding.
(2) Cameco's share is 69.805% of total Mineral Reserves.

The current mine plan has been designed to extract all the current Mineral Reserves. 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. A breakdown of the Mineral Reserve estimates by Zone, as of August 31, 2012, is shown in Table 15-3.

Table 15-3: Mineral Reserves by Zone – August 31, 2012

Category	Area	Total tonnes (x1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Reserves					
Proven	MCA Stockpile	3.6	15.92	1.3	0.9
	KEY Stockpile	0.5	13.11	0.1	0.1
	Total Stockpile	**4.1**	**15.59**	**1.4**	**1.0**
	Zone 2	120.8	17.88	47.6	33.2
	Zone 4	259.6	26.69	152.8	106.6
	Total In-Situ	380.3	23.90	200.4	139.9
	Total Proven	**384.4**	**23.81**	**201.8**	**140.8**
Probable	Zone 1	126.8	15.30	42.8	29.9
	Zone 2	32.9	4.10	3.0	2.1
	Zone 3	51.4	17.94	20.3	14.2
	Zone 4 South	349.5	7.61	58.6	40.9
	Zone B	117.1	22.85	59.0	41.2
	Total Probable	**677.8**	**12.30**	**183.7**	**128.3**
Total Reserves		**1,062.2**	**16.46**	**385.5**	**269.1**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Totals may not add up due to rounding.
(2) Cameco's share is 69.805% of total Mineral Reserves.

The updated 2012 Mineral Reserve estimates reflect the changes mainly due to:

- Zone B was moved into the Probable Reserves category with the creation of a mine plan around the previously declared Mineral Resource;
- Zone 1 saw a decrease in mining dilution based on a revised mine plan which combined the lower and upper mining zones;
- Zone 2 saw a decrease in Proven Reserves, due to mining activity (9.2 Mlbs U_3O_8) and a downgrade in the Mineral Reserve estimate for the Panel 5 area (1.1 Mlbs U_3O_8 year-to-date negative variance to Mineral Reserves as well as -4.4 Mlbs U_3O_8 adjustment of remaining Panel 5 Mineral Reserves) and the Zone 2 fringe areas were downgraded from Proven to Probable Reserves (3.0 Mlbs U_3O_8) until a more detailed mine plan is established for the area;
- Zone 4 Mineral Reserves decreased due to mining activity (4.2 Mlbs U_3O_8), which included a negative year-to-date variance to the Mineral Reserve of 0.5 Mlbs U_3O_8; and
- Zone 4 South Reserves increased significantly with the addition of the former McA South Zone of 20.3 Mlbs U_3O_8.

A summary of the changes in Mineral Reserves is shown in Table 15-4.

Table 15-4: Changes to Mineral Reserves

	Year-end 2011			August 31, 2012			Changes	
Category	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Total tonnes (x 1000)	Grade % U_3O_8	Total Mlbs U_3O_8	Total Mlbs U_3O_8	Cameco's Share Mlbs U_3O_8
Proven	457.5	22.07	222.6	384.4	23.81	201.8	- 20.8	- 14.5
Probable	412.7	11.14	101.4	677.8	12.30	183.7	82.3	57.4
Total Reserves	**870.2**	**16.89**	**324.0**	**1,062.2**	**16.46**	**385.5**	**61.5**	**42.9**

Notes: (1) Cameco reports Mineral Reserves and Mineral Resources separately. Totals may not add up due to rounding.
(2) Cameco's share is 69.805% of total Mineral Reserves.

Compared to previous estimate of Mineral Reserves disclosed by Cameco, as of December 31, 2011, the Mineral Reserves saw an increase in tonnage of 22.1%, a slight decrease in the average grade and an increase of the estimated contained pounds by 19.0%.

15.4 Discussion on Factors Potentially Affecting the Mineral Reserve Estimates Materially

As in the case for most mining projects, the extent to which the estimate of Mineral Reserves may be affected by mining, metallurgical, infrastructure, permitting and other factors could vary from major gains to total losses of Mineral Reserves. There are no known issues to the authors of this section expected to materially affect the Mineral Reserve estimates.

The McArthur River drilling database is considered to be reliable. This is supported by the annual reconciliation of the mine production to within on average 5% of the estimate of pounds of uranium for the last five calendar years as shown in Table 15-1.

The raisebore and boxhole mining methods and the overall mining and freezing plans for McArthur River have been developed specifically to mitigate the mining challenges such as the low strength of the rock formation, the groundwater and the high radiation levels, and to mine the deposit in a safe and economic fashion. Unexpected geological or hydrogeological conditions or adverse mining conditions could lead to losses of Mineral Reserves. None of these issues that are known to the authors of this section, however, are expected to materially affect the Mineral Reserve estimates, but they could delay production and increase costs.

An average uranium price of US$61 per Lb U_3O_8 was used with a US$1.00 = Cdn$1.00 fixed exchange rate to estimate Mineral Reserves. Due to the high grade nature of the McArthur River deposit, the McArthur River Reserves are robust and not significantly sensitive to variances in uranium price of plus or minus $20 provided that the annual production remains above 10 million pounds U_3O_8 (approximately 1% variance in Mineral Reserves). A decrease of $35 in the uranium price would reduce the amount of pounds U_3O_8in the Mineral Reserves estimates by approximately 4% provided that the annual production remains above 15 million pounds U_3O_8.

16 MINING METHODS

This section describes the technical aspects of underground mine development and operations, including the mine stability and ground support, hydrogeology, test mining activities, selection of mining methods, mine development, mining system and mining services.

16.1 Mine Design and Controls

The McArthur River deposit presents unique challenges that are not typical of traditional hard or soft rock mines. These challenges are the result of mining in or near high pressure radon bearing ground water in challenging ground conditions with significant radiation hazards due to the high grade uranium ore.

Mining methods are selected on their ability to mitigate risks associated with high pressure water, radiation hazards and poor ground conditions. Mine designs are coordinated through the sites mine engineering department. The design process involves an internal review process that involves all stakeholders and technical experts. When required, third party technical experts are included in the design process. In general, designs are conservative in order to protect the high value deposit and to avoid a serious to catastrophic inflow event.

All new development areas, new production areas and new mining methods undergo internal technical review and approval. These reviews are carried out to determine the level of risk associated with the planned work and if the controls identified are sufficient to mitigate that risk. Design authority is jointly shared between the operational manager and technical manager. In addition to the internal review and approval process, external CNSC regulatory review and approval is also required as per the sites Uranium Mine Facility Operating Licence.

Standard controls utilized at McArthur River for managing hydrological, radiological and geotechnical risks are described below.

16.1.1 Hydrological Conditions and Controls

All the mineralized areas discovered to date at McArthur River are in or partially in water bearing ground with pressures ranging from 680 to 850 psi. Hydrological conditions can be divided into two regions:

Water Bearing: The water bearing region consists of all the rock units above the unconformity contact (conglomerate and sandstone). Drawdown testing has demonstrated that the fracture patterns, along with water bearing joints and bedding planes are directly connected to the surface groundwater table. The sandstone and conglomerate itself, however, is not porous. Water flow rates through the fractures and joints will vary, but typically the highest conductive pathways are associated with the P2 fault as the brittle, flat lying sandstone has been well fractured by the tectonic forces of the thrust fault.

Basement: The basement consists of all the rock units below the unconformity contact (biotite gneiss, cordierite gneiss, quartzite plus some minor units). The basement units are typically dry, but can contain open water pathways to the sandstone. These pathways typically consist of faults, fractures, joints and unsecured drillholes. The risk of intersecting water pathways increases with the proximity to the unconformity contact.

In order to reduce the inherent risk of an inflow, the high pressure water sources are isolated from active development and production areas. To date, McArthur River has relied on pressure grouting and ground freezing to successfully mitigate the risks of the high pressure groundwater.

16.1.2 Radiological Conditions and Controls

Gamma, radon, radon progeny and long-lived radioactive dust (LLRD) hazards are all present at McArthur River. The degree of radiological risk and controls required is a function of location. The McArthur River deposit can be divided into three radiological regions:

Massive Mineralization: The massive mineralized region consists of the known ore zones and areas of continuous mineralization. The ore regions are well identified ahead of development and typically consist of massive pitchblende and coffinite. Grades typically average 16% U_3O_8 but can be greater than 80% U_3O_8 in localized areas.

Transition Mineralization: The transition areas consist of the ground that surrounds the orebody and typically contains low levels of mineralization due to small ore stringers that offshoot from the main orebody. Due to the random nature of these ore stringers, it is often difficult to model and identify. Transitions can be sharp when moving east-west (on the mine grid), but highly variable when moving sub vertically along the P2 fault trend.

Non Mineralized: The non mineralized region consists of all the rock units located sufficient distance away from the orebodies with no mineralized stringers present.

Gamma, radon, radon progeny and long-lived radioactive dust (LLRD) hazards are all present in the mineralized areas. Gamma and LLRD hazards are not present in the non mineralized areas. Typically water intersected in non mineralized areas does not contain significant amounts of radon unless proximal to the mineralization.

Controls must be in place in order to ensure that the regulatory requirements are met. Typical controls used at McArthur River include avoiding development in high grade mineralization whenever possible and practical, shielding of gamma sources, direct exhaust ventilation, point source ventilation capture of radon gas sources, remote technology whenever possible and practical, ground freezing and pressure grouting to prevent entry of radon bearing water.

16.1.3 Geotechnical Conditions and Controls

Ground conditions at McArthur River can be highly variable depending on location within the mine. Typically the rock mass is fair to excellent away from the P2 fault. Ground conditions near the P2 fault is typically poor to very poor due to alteration and fracturing (Table 16-1). Typical geological cross-sections are shown in Figure 16-1 and Figure 16-2.

Stable openings must be maintained at McArthur River for both the safety of the underground workers and to prevent ground failures that may lead to an uncontrolled water inflow. Typical techniques employed at McArthur River include limiting the size of openings, installing ground support in a timely manner, tight filling of mined out areas and using road headers and raisebores to avoid blast damaged ground.

Table 16-1: Rock Geotechnical Classification

Unit Name	Rock Quality	Compressive Strength (MPa)
Sandstone	good to excellent	50-230
Sandstone, altered	poor to extremely poor	<30
Ore zone	fair to poor	highly variable
Cordierite Pyretic Gneiss (CPG)	good	40-130
Cordierite Pyretic Gneiss (CPG), altered	fair to poor	<40
Biotite Pyretic Gneiss (BPG)	good	40-120
Biotite Pyretic Gneiss (BPG), altered	fair to poor	<40
Graphite	very poor	<5
Pegmatite	good	80-130
Conglomerate	fair to good	30-180
Conglomerate, altered	fair to extremely poor	<30
Quartzite	good to excellent	50-280

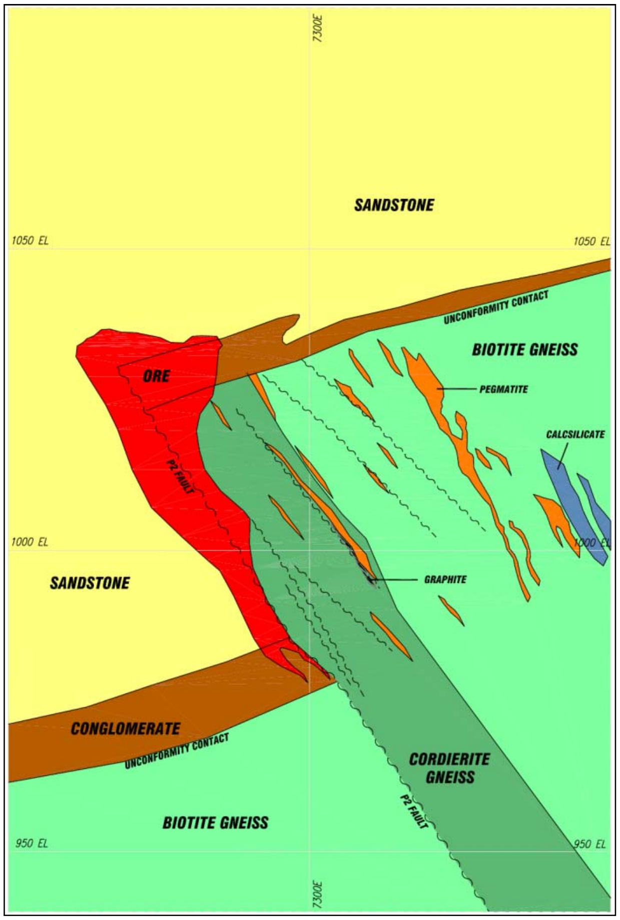


Figure 16-1: Typical Geological Cross-Section (except Zone 2)

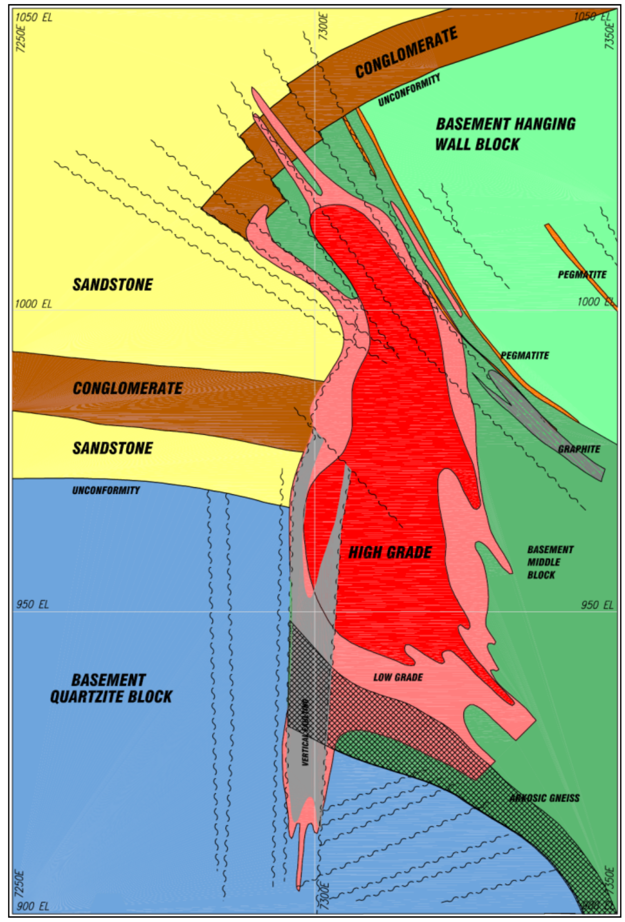


Figure 16-2: Typical Zone 2 Geological Cross-Section

16.2 Mine Development

Development at McArthur River is classified into three categories, low, medium, and high-risk development based on hydrological, geotechnical and radiological risks. The classification system is detailed in Table 16-2.

Table 16-2: Underground Development Risk Classification

	Hydrological	Geotechnical	Radiological
Low Risk	Minimal water inflow risk, inflow rate expected to be less than 100m^3/hr. Development in basement rock at least 20m away from unconformity contact or development with full freeze protection. Examples: Inflow risk from fracture/joint system in basement rock connected to the sandstone (indirect pathway, low water conductivity).	Competent to very competent rock mass RMR 50% or higher GHM 10 to 15 Medium to long unsupported stand-up time (weeks to years) Examples: Surface loose only, small shallow blocks or wedges (manageable by bolts & screen).	No known or significant radiation sources (radiation work permits generally not required). Manageable within the Code of Practice using standard monitoring and practices. Examples: Development in waste or low grade ore stringers. Radon and radon progeny levels remain below action levels.
Medium Risk	Moderate water inflow risk, inflow rate expected to be less than 500m^3/hr. Development in basement rock between 15m to 20m away from unconformity contact without freeze protection or development near a known water conductor. Examples: Inflow risk from an open drill hole or water conductive geological structure (i.e. fault) connected to the sandstone.	Weak to competent rock mass RMR 30% to 50% for length of development advance GHM 20 Short unsupported stand-up time (days to weeks) Examples: Ground may unravel or fail into a stable shape or profile requiring additional support. May require spiling to maintain stability and profile until support is installed.	Moderate radiation sources (radiation work permits generally required). Manageable within the Code of Practice with standard practices, increased monitoring and exposure controls required. Examples: Development in high grade stringers or short lengths massive ore less than 20%. Radon or radon progeny levels may become elevated above action levels.
High Risk	Substantial inflow risk, inflow rates potentially greater than 500m^3/hr. Development without full freeze protection within 15m of the unconformity contact. Examples: Inflow risk from multiple open bore holes or persistent water conductive geological structure. Development near the unconformity that could result in an uncontrolled cave or back failure triggering an inflow event.	Weak to incompetent rock mass RMR < 30% for length of development GHM 25 or higher Very short or no unsupported stand-up (could fail any time after excavation). Potential for uncontrolled “run away” caving. Example: Development through unconsolidated ground.	Significant radiation sources (radiation work permits always required, restricted access). Manageable within the Code of Practice with significant controls. Non-standard development practices may be required. Examples: Development in massive high grade ore greater than 20%. Respiratory equipment may be required for radon or radon progeny.

Notes: (1) RMR = Rock Mass Rating
(2) GHM = Ground Hazard Model

Low and medium risk development accounts for the majority of development while high risk development accounts for less than 5% of the yearly development. High risk development is typically associated with development through the P2 fault or unconformity.

Probe and grout covers are maintained ahead of the development face to gather geological, geotechnical, hydrological and radiological information and to pressure grout off water bearing structures. Formal probe and grout reviews are jointly carried out by the site's mine engineering and geology departments prior to advancing development.

Drift dimensions vary depending on the location and end use. Normal travel ways are excavated as a 5 m x 5 m drift with an arched back. Standard ground support consists of 2.4 m Dywidag bolts on a 1.2 m x 1.2 m pattern and 6 gauge welded wire mesh screen. Worker entry under unsupported ground is not permitted.

Standard ground support is generally sufficient for all development classed as low risk. Ground support for medium and high-risk development plus intersections and large spans are assessed individually and the appropriate level of support installed. Typical ground support controls based on the level of risk is as follows:

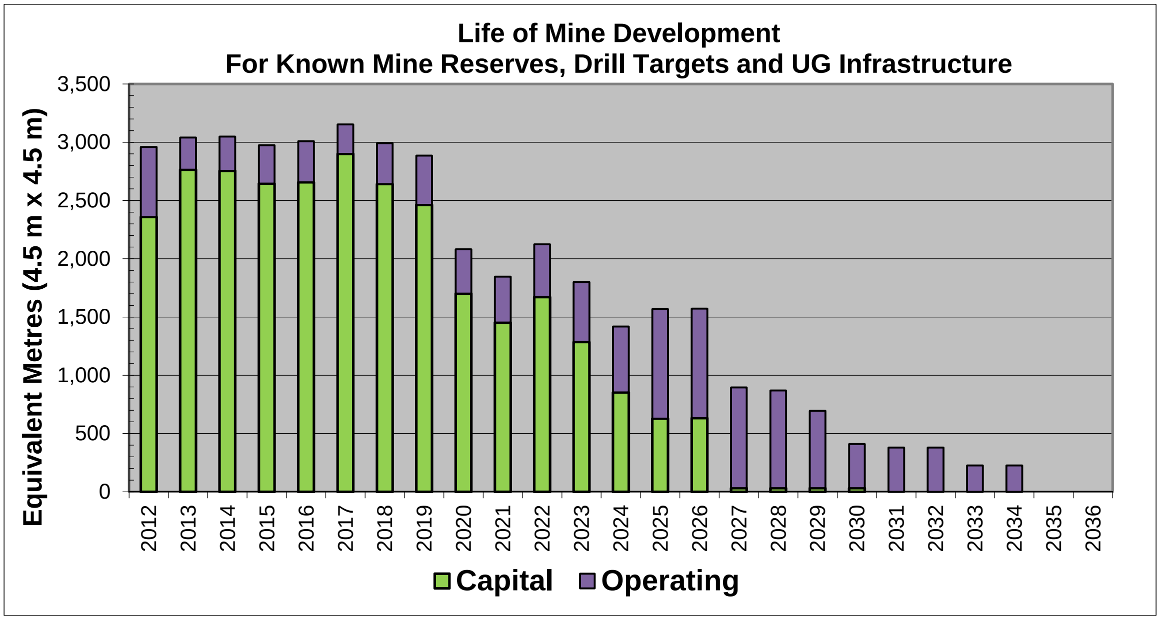
- **Low Risk Development**: Low risk development is advanced using drill and blast development. Bolt and screen support is generally sufficient to stabilize the ground. Secondary ground support such as shotcrete and cable bolts are installed as required.
- **Medium Risk Development**: Medium risk development generally requires additional primary ground support above bolts and screen or modification to the excavation method. This may include shorter rounds, spiling, shotcrete or cable bolting before advancement, excavation with road header, two-pass development, etc.
- **High Risk Development**: High-risk development generally requires pressure grouting or freeze coverage. Increased primary ground support above the standard bolt and screen pattern is usually required. Pre support such as spiling may be required. Modification to the excavation method may be required such as utilization of a road header or multi pass development. High Risk development may also require emergency contingency plans for an inflow scenario in the heading. All high-risk development undergoes a formal risk assessment.

Completed and planned development is maintained in three-dimensional mine design software, which is integrated with the geological model and drillhole database.

Total development metres, as shown in Figure 16-3, are expected to remain at approximately 3,000 equivalent metres per year from 2012 to 2019 and then begin tapering off into operating development only later in the mine life. The development forecast estimate includes all development required to mine the current Mineral

Reserves, development required to access and drill known exploration targets of interest and development for underground (UG) support infrastructure.

Figure 16-3: Life of Mine Development Summary



16.3 Ground Freezing

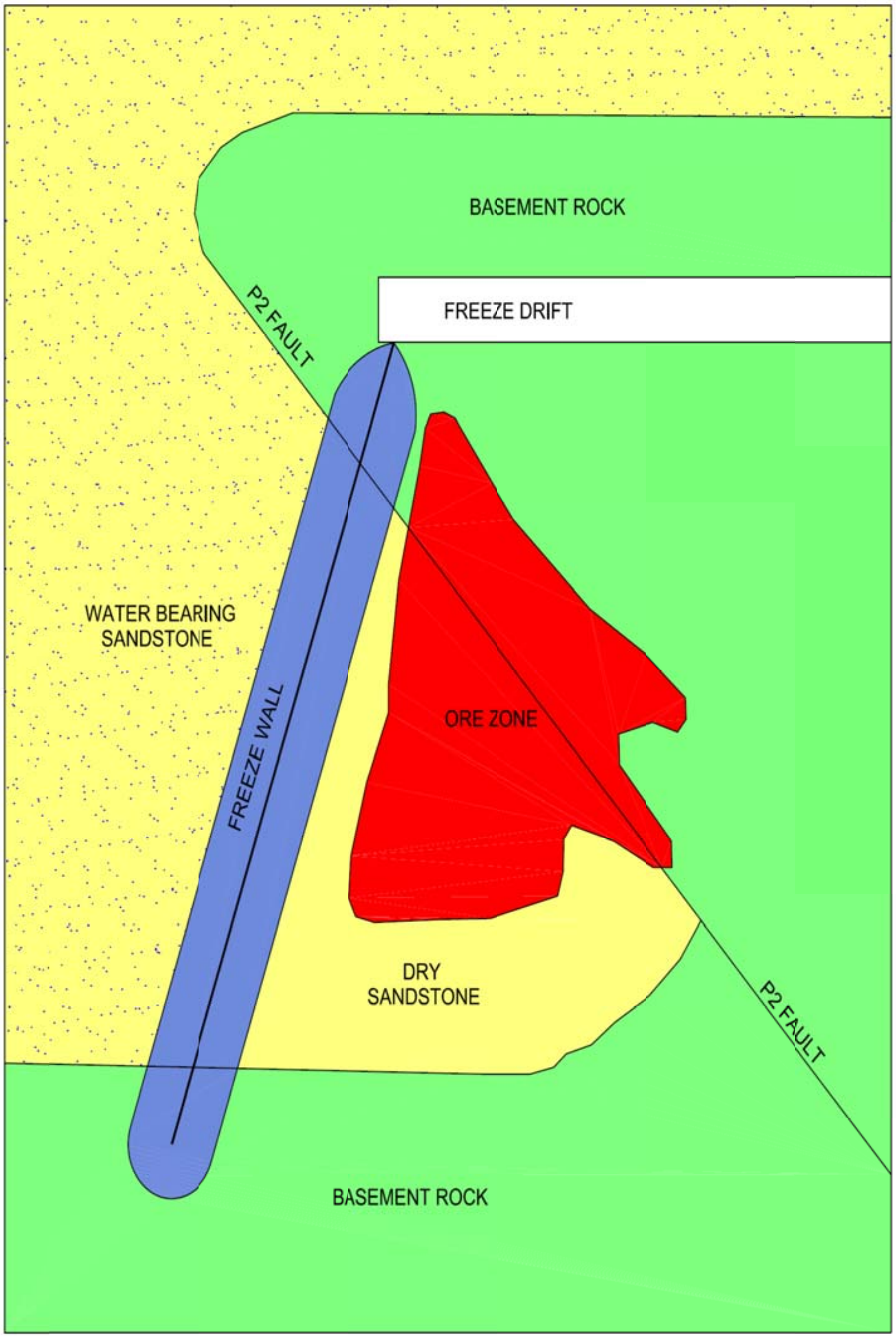
Ground freezing is used at McArthur River as a means to prevent or restrict high pressure ground water from entering the mine. To date, it has been used to isolate production zones, assist with isolating previous inflow areas and for development freeze coverage. Typical freeze structures used to date at McArthur River consist of freeze walls, mass freezing and freeze shields.

16.3.1 Freeze Wall

A freeze wall (or shell) is a region of frozen ground that completely isolates a region of the underground workings or extraction areas from water bearing ground. Ground within the freeze wall is distinguished by the lack of water re-charge once drained and by static water pressure significantly below the water bearing ground outside the freeze wall. In order to achieve this, the freeze shell is made of interlocking freeze walls and is anchored into non water bearing basement rock. Figure 16-4 shows a typical freeze wall schematic. For clarity, the end walls are not shown.

Freeze walls currently exist in the Zone 2 and Central Zone 4 Lower mining area. Freeze walls are also planned for all the remaining undeveloped mining areas.

Figure 16-4: Freeze Wall Cross-Section Schematic



Source: Cameco

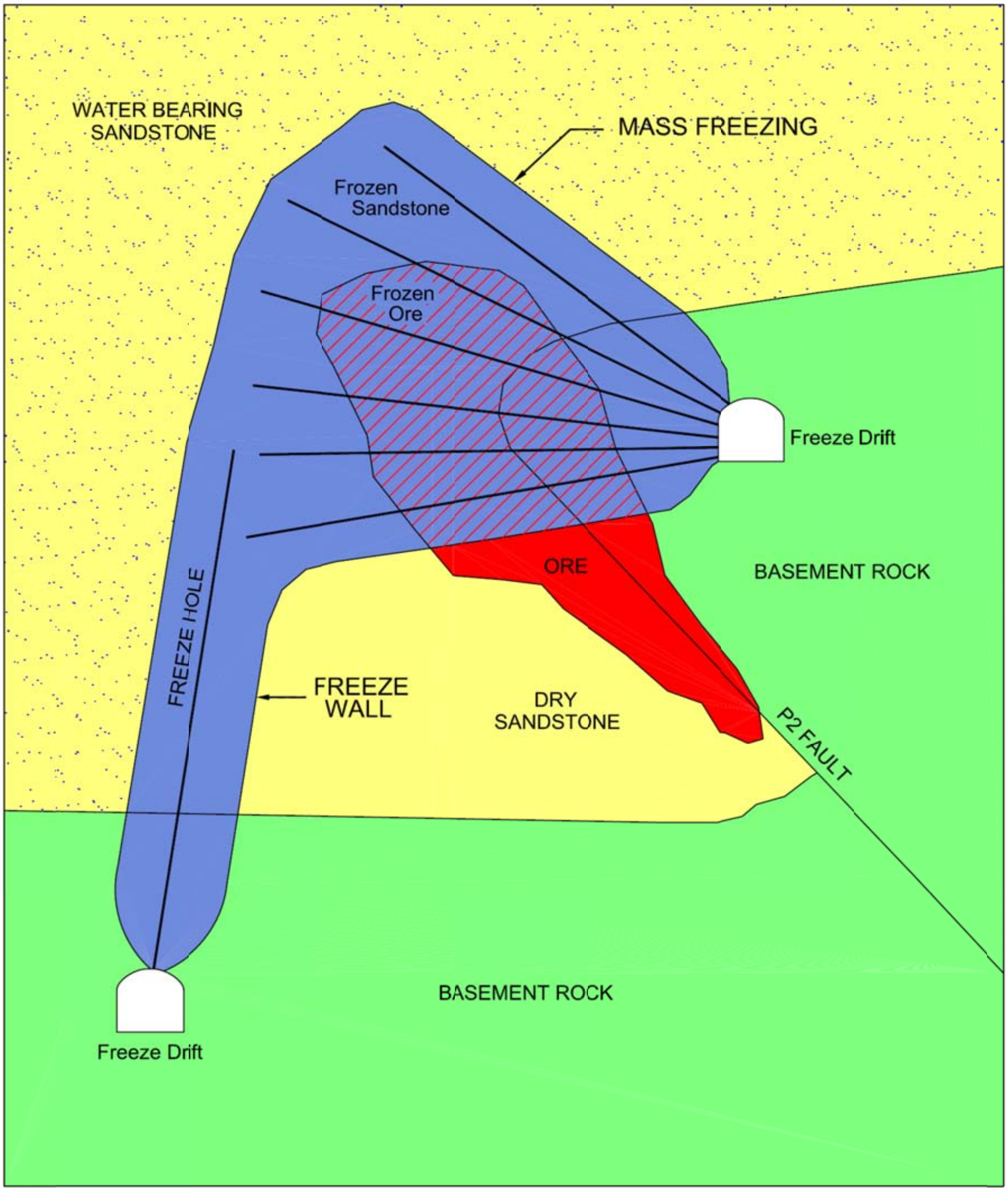
16.3.2 Mass Freezing

Mass freezing is a method of bulk freezing the entire mining area, prior to the start of mining. Figure 16-5 shows a typical freeze wall with mass freezing. Mass freezing is typically considered suitable for areas where the rock mass is exceptionally weak and at risk of uncontrolled cave-ins without strengthening by ground freezing.

In order to successfully mass freeze an area, parallel freeze rings must be drilled close enough to allow the ground freezing to connect between rings. Mining extraction or development would take place between freeze rings.

Mass freezing is being tested as part of the Zone 4 boxhole test program. No future mass freeze areas are currently planned.

Figure 16-5: Freeze Wall Combined with Mass Freezing Cross-Section Schematic



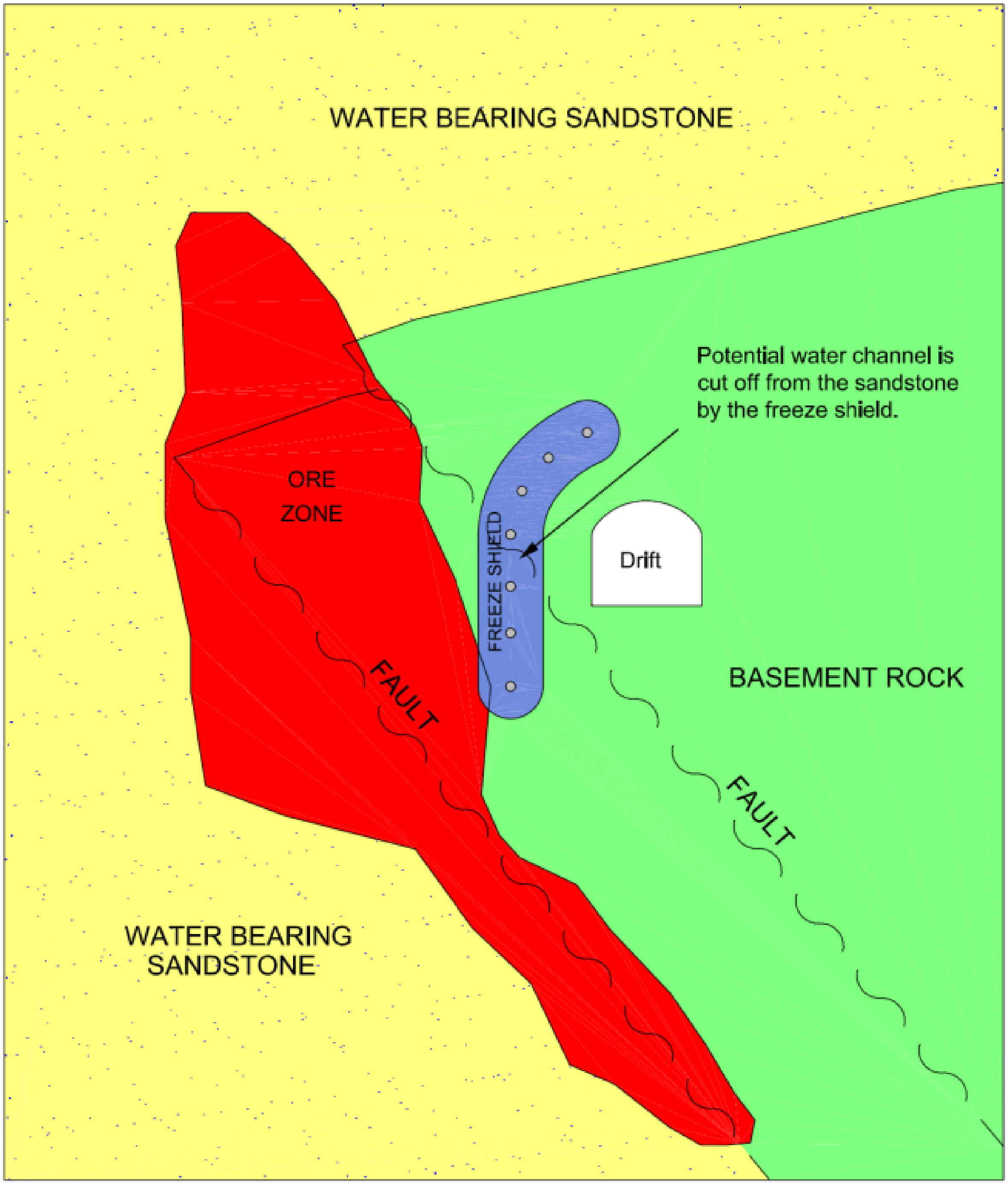
Source: Cameco

16.3.3 Freeze Shield

A freeze shield is a region of frozen ground that does not completely isolate a region from water bearing ground. This type of freeze structure is typically used where simply impeding the flow of water through water bearing structure is sufficient.

A freeze shield was used to successfully establish to the 530-7300E Zone 4 Freeze drift where water conductive sub-faulting was known to pass closely to the planned excavation. A typical freeze shield is shown in Figure 16-6.

Figure 16-6: Development with Freeze Shielding Cross-Section Schematic



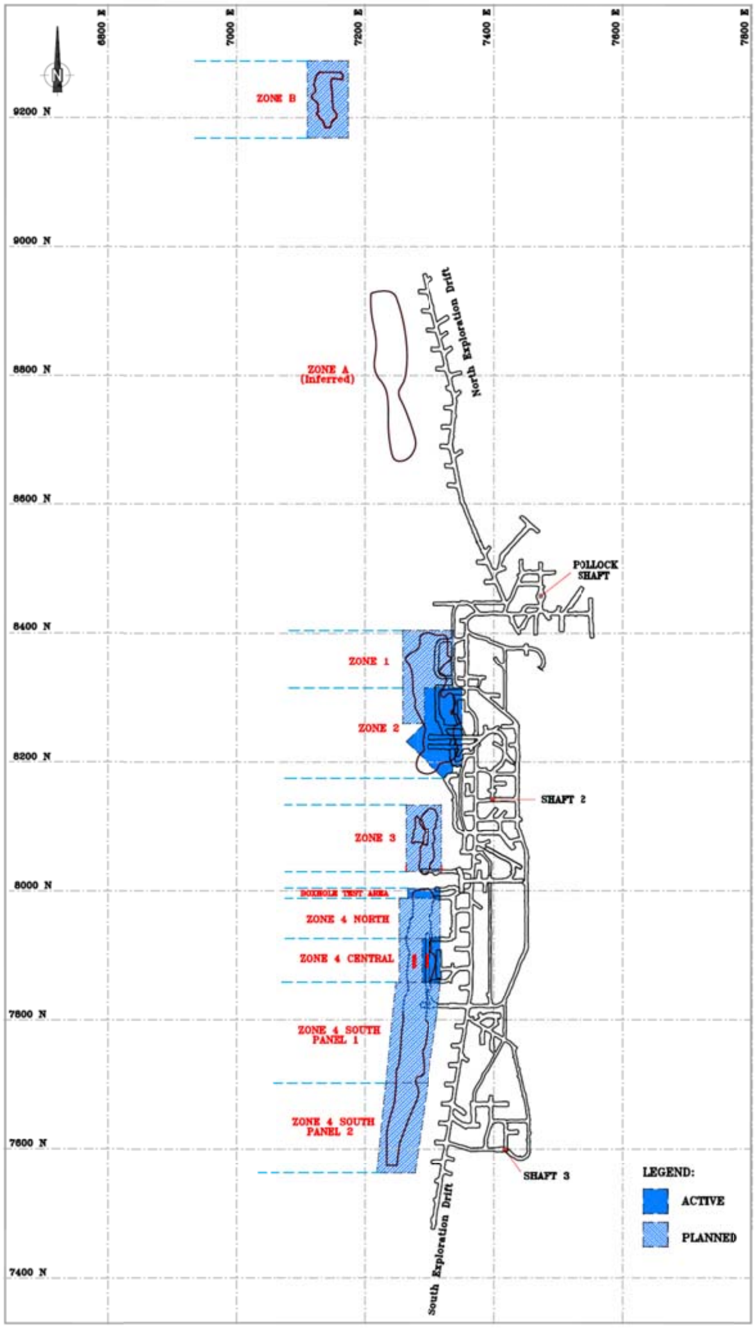
Source: Cameco

16.3.4 Future Ground Freezing

Ground freezing will remain the primary method for isolating the water bearing ground from the mine areas. All future mining areas will utilize freeze walls anchored into the basement rock similar to the current Zone 2 and Zone 4 mine areas. Figure 16-7 shows the areas which are either currently or expected in the future, to use ground freezing.

The freeze walls are assumed to remain active for the life of mine due the risks involved with fully decommissioning a freeze area and the fact that the earliest a full decommissioning could occur is late in the mine life (2028) when there would be marginal benefit when compared to the risks and cost.

Figure 16-7: 530 m Level Plan View of the Current and Future Freeze Areas



Source: Cameco

Note: (1) North arrow indicate mine grid North.

16.4 Mining Methods

Raisebore mining is currently the only approved mining method at McArthur River. It has been successfully used for mining approximately 225 Mlbs as of August 31, 2012 since production start-up in 1999. Drill and blast and boxhole mining is currently approved for testing only. Upon successful completion of these test programs, an application will be made to CNSC to approve both drill and blast and boxhole mining as extraction methods for McArthur River. Testing of these two methods is scheduled to be completed in late 2013.

16.4.1 Raisebore Mining

Raisebore mining is suitable for massive high grade zones where there is access both above and below the ore zone. Raisebore mining is scheduled to remain the primary extraction method over the mine life for both current and future mine areas.

A raisebore chamber is typically developed in waste above the ore zone and an extraction chamber is typically developed in waste below the ore zone. A raisebore is set up in the raisebore chamber and a standpipe is installed. Pilot drilling then begins and is drilled to breakthrough into the lower extraction chamber. All cuttings from pilot drilling are contained and piped away to avoid ore contamination of the raisebore chamber. Raisebore mining allows drill and extraction accesses to be driven in waste over 120 m apart. Waste and ore can be easily separated by scanning and the raise opening created in the weak rock mass has proven to be very stable.

Once breakthrough occurs, the reamer is installed and the face is “sumped in” (establish a flat face in the back perpendicular to the drill string). Reaming continues through waste and into the ore. Raisebore cuttings are mucked remotely as required, ensuring the raise does not become choked off. All cuttings from production raises are scanned for ore grade estimates and delivered to the appropriate dump locations. High grade ore is processed through the underground grinding circuit and pumped to surface as slurry. Mineralization grading less than 2% not used for blending in the grinding circuit is skipped to surface.

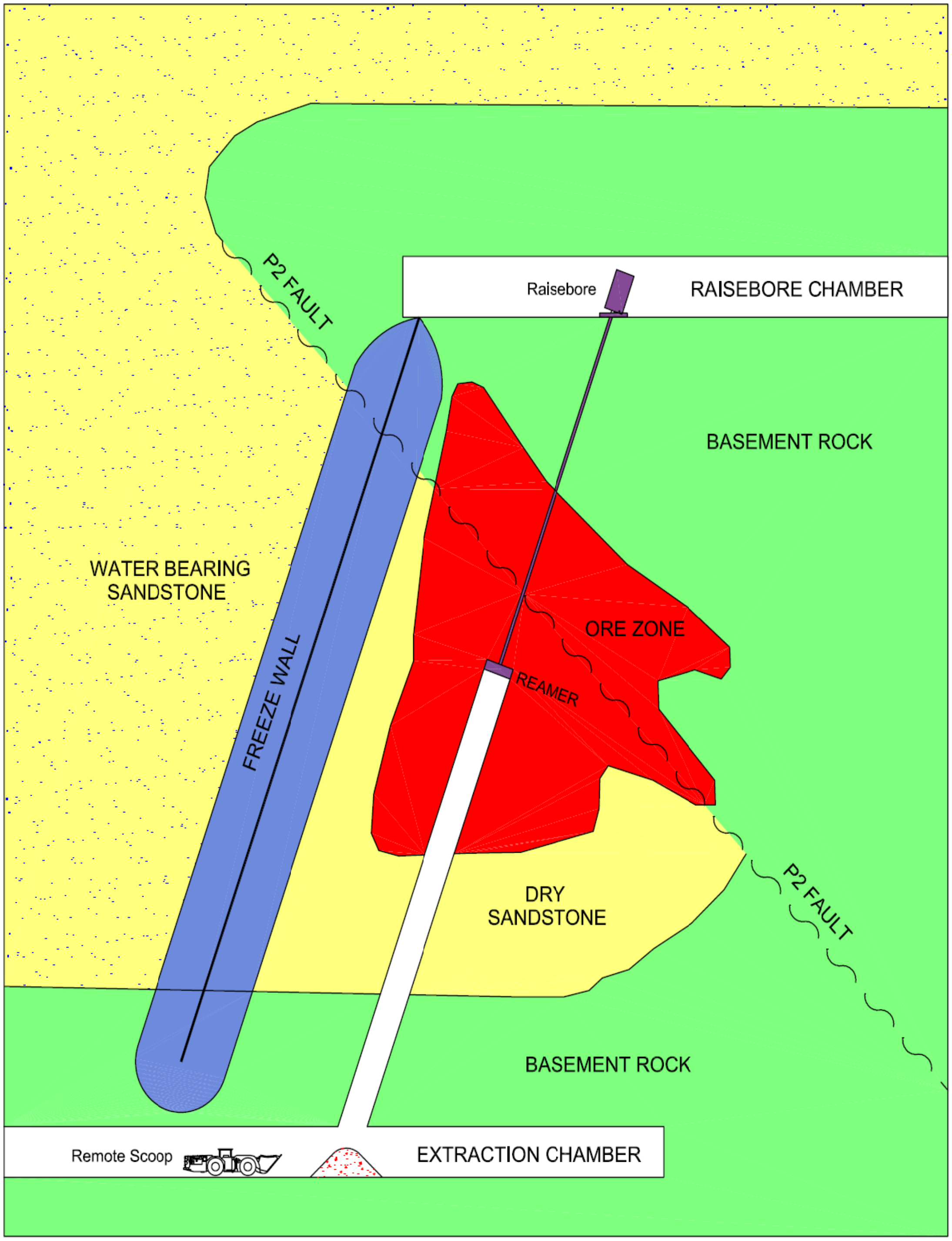
Reaming stops at the end of the ore contact below the raisebore chamber. The reamer is lowered to the brow of the open hole and final muck cleanup of the chamber is carried out. The reamer is then lowered to the sill and the backfill gantry is installed for head cover protection. The chamber and reamer are washed down and then the reamer is removed. The gantry is removed and the rods are tripped out of the raise. Once all the rods are out, the raisebore is moved to the next scheduled production raise.

Once the tripping out is complete, backfilling can begin. This is done in three stages (plug, second and final) using concrete as backfill material. The bottom of the raise is sealed with a backfill gantry and the initial plug pour is placed from the bottom of the raise using a portable concrete pump. After the first pour has set, the second pour is placed from the raisebore chamber through the pilot collar. After the second pour is set, the plug is bolted for increased stability. The final pour is then completed from the raisebore chamber through the pilot hole.

Production raises are designed to overlap each other in order to maximize recovery of the high grade ore at the expense of an average cement dilution of approximately 17%. Actual mining recoveries are typically 97.5% with a small amount of the ore lost in the cusps between the raises.

The raisebore mining method is shown in Figure 16-8.

Figure 16-8: Raisebore Mining Cross-Section Schematic



Source: Cameco

16.4.2 Boxhole Mining

Boxhole boring as a mining method is currently being tested at McArthur River. This is a vertical development technique that is used in a few select mines around the world. This is its first application as a mining method in the uranium industry. As of August 2012, four test raises in waste and two test raises in ore have been successfully completed. The test program is scheduled to be completed late 2013 and if successful, an application will be made to CNSC to approve boxhole mining as an extraction method for McArthur River.

Boxhole mining is expected to be suitable for areas where it is not feasible or practical to establish access above the ore zone. These areas would typically be small high grade ore areas with a short strike length. Extraction rates for boxhole mining are approximately half of raisebore mining due to the smaller diameter reamer (2.1 m diameter for boxhole versus 3.0 m for raisebore).

Originally, boxhole mining was planned for the some of the more challenging upper mining areas, but following the success in development of Zone 2, Panel 5, mine designs were revised and boxhole mining was replaced with the more productive raisebore mining method. Boxhole mining is planned to continue in the boxhole test chamber after testing is complete in order to recover the remaining ore. Once mining is complete in the boxhole test area, no further use of this mining method is currently planned. Boxhole will remain a contingency mining method.

The equipment used for boxhole mining is similar to raisebore mining; however, the drill setup is configured for pushing a reamer upward in compression verses pulling a reamer upward in tension. Both the drill and extraction chambers for boxhole mining are located below the ore zone in waste. The drill chamber is located directly below the extraction chamber with a waste pillar between the levels.

The boxhole drill (an inverted raisebore drill) is set up in the drill chamber. A pilot hole is collared and drilled to the extraction chamber above. The pilot hole is re-collared in the back of the extraction chamber. A muck chute is installed and piloting continues to the end of the design raise depth.

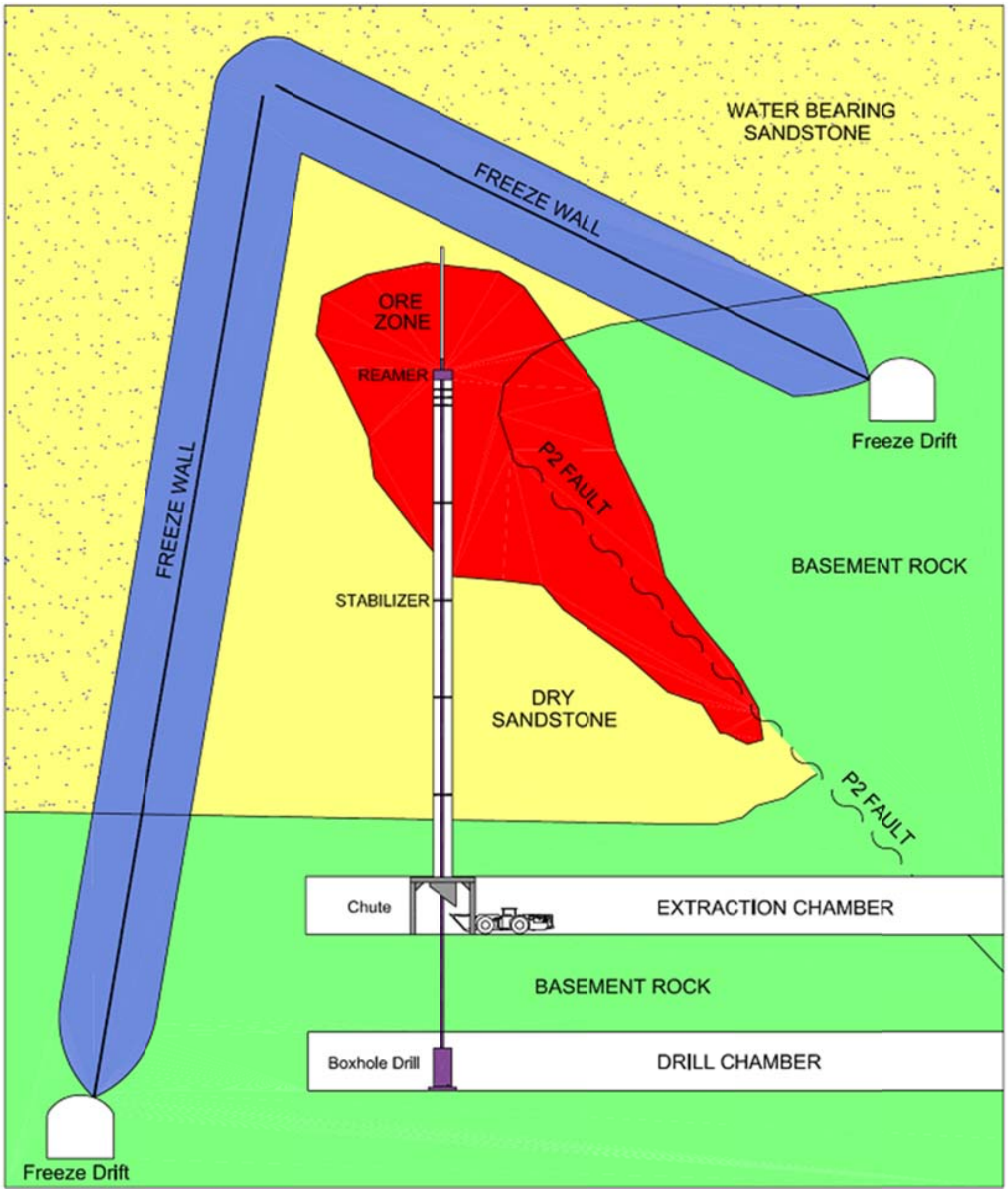
The rods are then tripped out to the extraction chamber and a reamer with a stinger is installed. The face is sumped in waste until the muck chute can be closed. Reaming continues through waste and then into ore. Stabilizers are added to the drill string at fixed intervals to keep the drill rods centered in the open raise. The muck chute directs the cuttings away from the raise to permit mucking without hitting the drill string. Muck removal follows similar practices currently being used for raisebore mining. Reaming stops when the end of the ore contact is reached.

Completed raises are filled with concrete. A backfill gantry is placed below the raise and an initial plug is placed on top of the gantry. The second and final pours are placed either through a fill pipe placed in the raise or backfill holes drilled into the raise.

Ore recoveries and cement dilution for boxhole mining is expected to be similar to Raisebore mining.

A schematic drawing illustrating the boxhole mining method is shown in Figure 16-9.

Figure 16-9: Boxhole Mining Cross-Section Schematic



Source: Cameco

16.4.3 Blasthole Stope Mining

Blasthole stoping as a mining method is currently being tested at McArthur River. This mining method has been used extensively in the mining industry including uranium mining. As of August 2012, two test stopes in ore have been successfully completed.

The test program is scheduled to be completed late 2013 and if successful, an application will be made to CNSC to approve blasthole stoping as an extraction method for McArthur River.

Blasthole stoping is planned in areas where blast holes can be accurately drilled and small stable stopes excavated without jeopardizing the freeze wall integrity. Areas currently planned for blasthole stoping include remnant ore cleanup along the fringes of the orebodies and in areas where the vertical height of the orebody is 35 m or less.

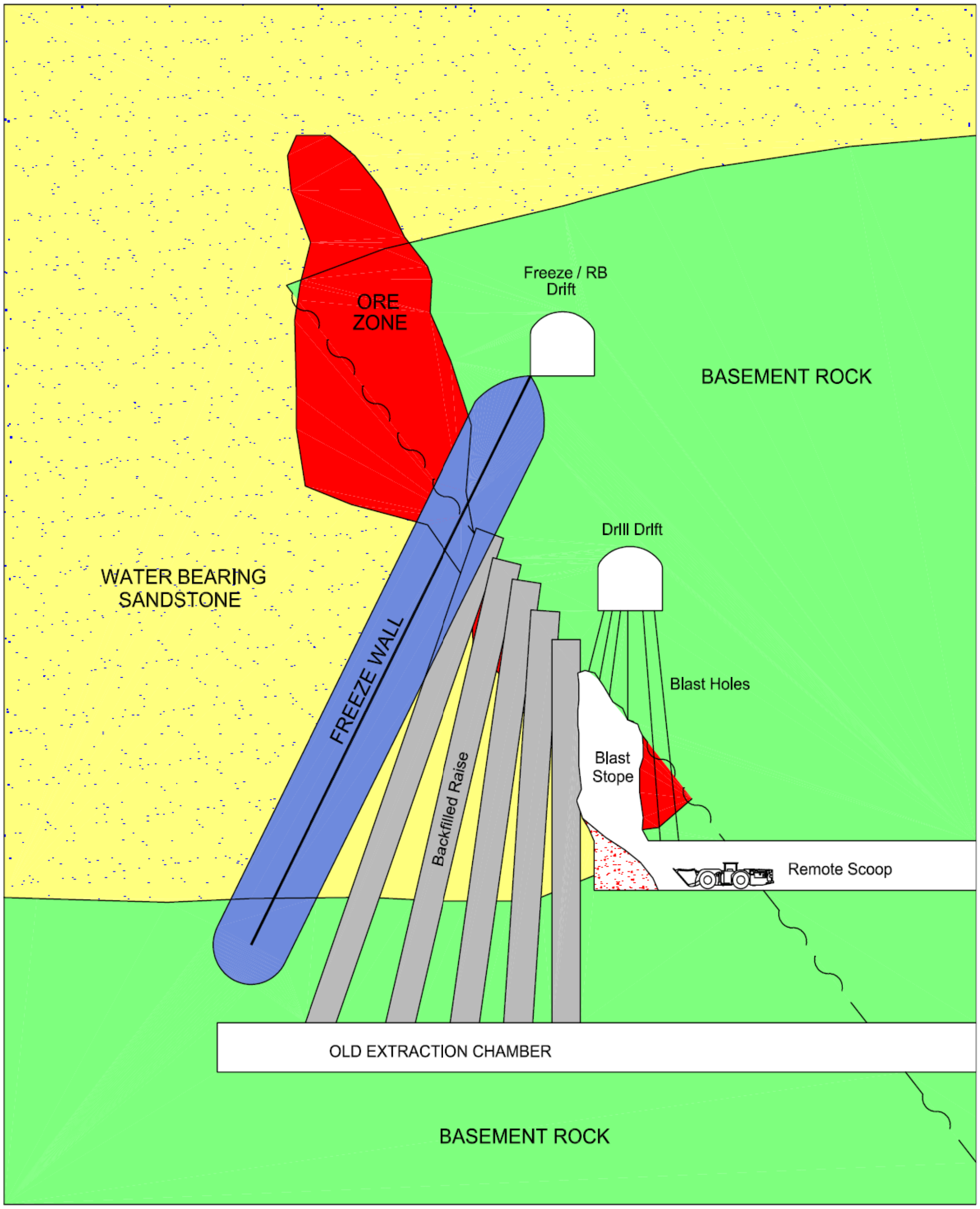
Drill and blast mining is currently not planned for the larger, more massive high grade areas in order to avoid development within the high grade ore and to minimize the amount of sublevels required for mine extraction. This method is expected to compliment the raisebore mining method and allow more economic recovery of the ore fringe areas as well as the smaller lower grade areas.

Drill and blast mining is expected to improve the overall extraction efficiency by reducing mineralized waste generation and improving extraction cycle time of the smaller, lower grade mine areas.

Drill access will be developed in waste above the ore and undercut muck access will be developed in waste or low grade ore below the ore. A slot will be excavated and drill holes placed around the slot. The drill holes will then be blasted into the slot. Blasting will take place in the ore zone only to minimize dilution. A waste cap will be left at the top of the stope. Mucking will take place from a draw point below the ore zone and follow similar practices currently being used for raisebore mining.

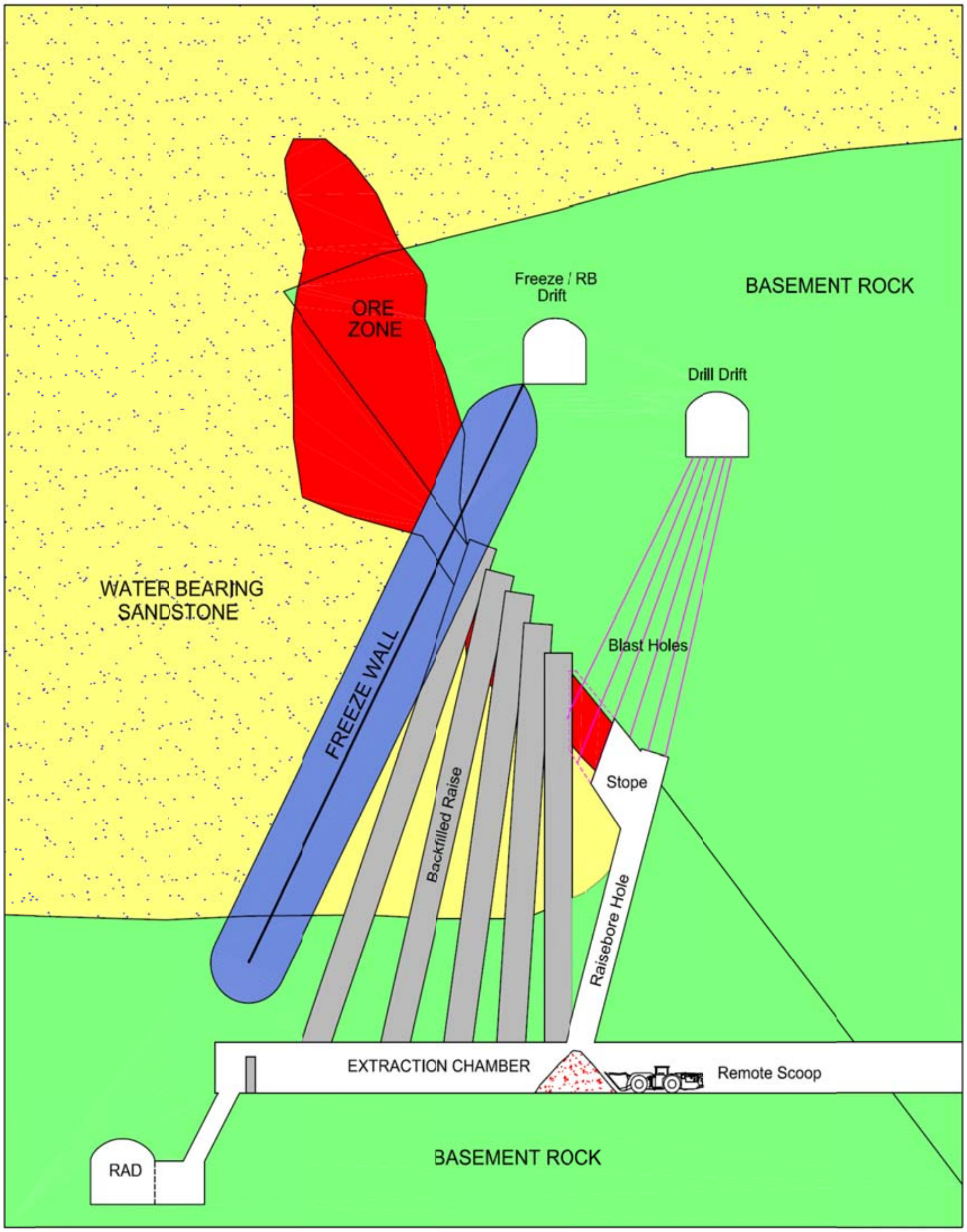
Depending on the ore location, a full stope undercut may be established or a small slot stope with a muck transfer raise to the extraction chamber. The blasthole stope mining method is shown in Figure 16-10. Figure 16-11 shows an area where blasthole stope mining may be applied.

Figure 16-10: Blasthole Stope Mining Cross-Section Schematic



Source: Cameco

Figure 16-11: Remnant Recovery Slot Blasting Cross-Section Schematic



Source: Cameco

16.5 Production Plan

McArthur River currently has sufficient Mineral Reserves to continue mining to year 2034. The production schedule assumes the current average licence limit of 18.7 Mlbs U_3O_8 per year until 2017. A planned production rate increase to 22.0 Mlbs pounds per year is scheduled in 2018, subject to receipt of regulatory approval. Between 2018 and 2026, average annual production of 21.5 Mlbs U_3O_8 is forecast. Estimated production then begins to decrease in three distinct steps towards the end of the mine life.

The mine and mill forecast production schedules for McArthur River and Key Lake Operations are shown in Table 16-3 and Figure 16-12.

Mill production at Key Lake will closely follow mine production for the life of mine. Differences in a given production year between mine and mill production will occur due to the addition of mineralized material stockpiled at Key Lake, year to year inventory changes and recovery rate.

Table 16-3: Life of Mine Annual Mine and Mill Forecast Production Schedule

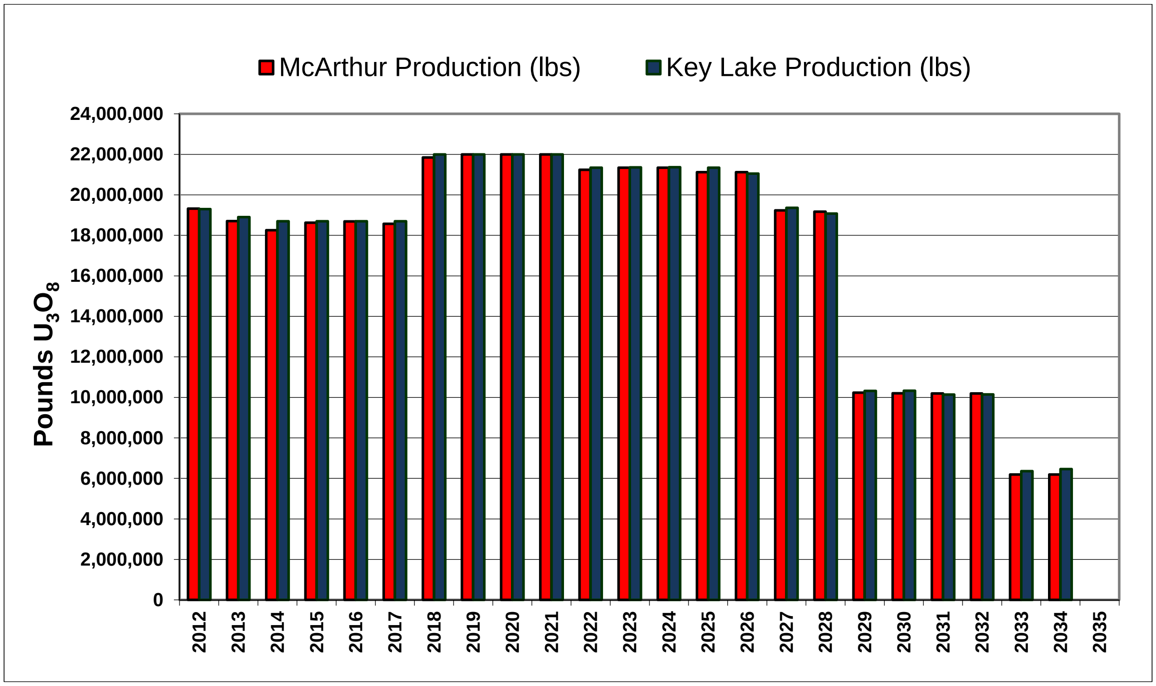
Description	2012	2013	2014	2015	2016	2017	2018	2019
Mine Production (Mlbs U_3O_8)	19.3	18.7	18.3	18.6	18.7	18.6	21.8	22.0
Mill Production (Mlbs U_3O_8)	19.3	18.9	18.7	18.7	18.7	18.7	22.0	22.0

Description	2020	2021	2022	2023	2024	2025	2026	2027
Mine Production (Mlbs U_3O_8)	22.0	22.0	21.2	21.3	21.3	21.1	21.1	19.2
Mill Production (Mlbs U_3O_8)	22.0	22.0	21.3	21.4	21.4	21.3	21.1	19.4

Description	2028	2029	2030	2031	2032	2033	2034	Total
Mine Production (Mlbs U_3O_8)	19.2	10.2	10.2	10.2	10.2	6.2	6.2	**397.8**
Mill Production (Mlbs U_3O_8)	19.1	10.3	10.3	10.1	10.1	6.4	6.5	**399.7**

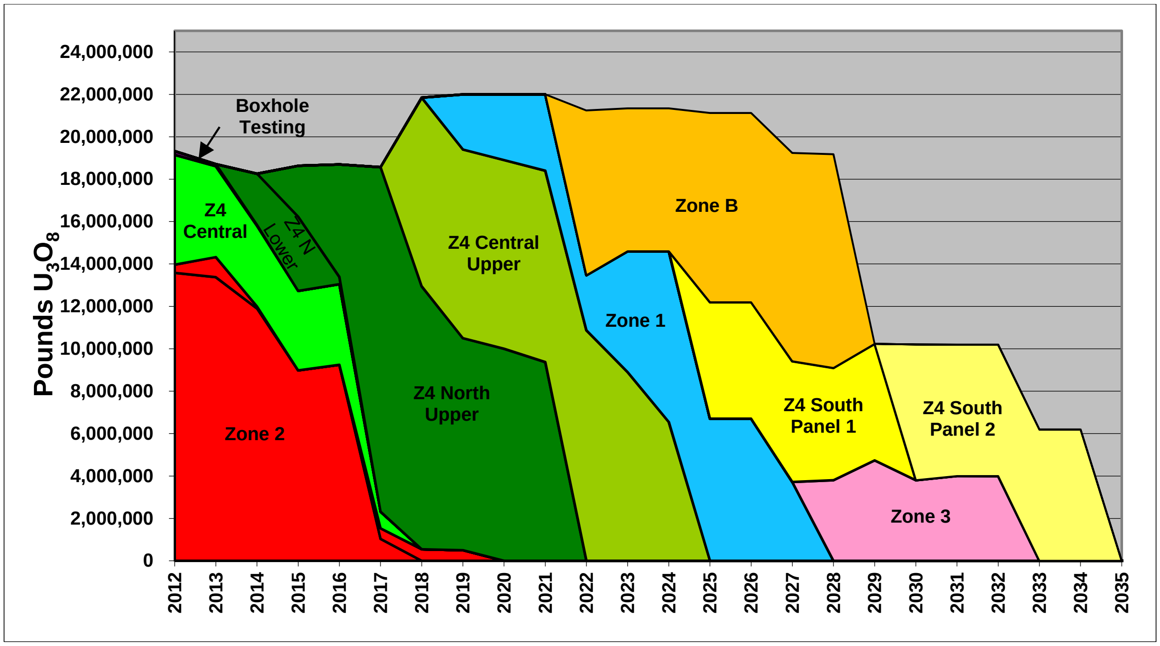
Notes: (1) Totals may not add up due to rounding.
(2) As of August 31, 2012, McArthur River is forecast to produce 387 Mlbs U_3O_8 (mill recovered).

Figure 16-12: Life of Mine Annual Mine and Mill Production Schedule



In order to successfully meet the planned production in the life of mine schedule, Cameco must continue to successfully transition into new mine areas. Figure 16-13 shows a summary of the life of mine production schedule by mine area.

Figure 16-13: Life of Mine Annual Production Schedule by Mine Area



Each mine area identified by colour represents a freeze wall expansion that isolates a zone or part of a zone from the water bearing sandstone in order to permit production mining to proceed.

Below is a brief description of the status of the planned mining areas and extraction method.

Zone 2 (Proven/Probable): Zone 2 is an active production area where mining has been in progress since year 1999. The area is isolated by a freeze wall that was expanded in 3 stages, Panels 1-2, Panel 3 and Panel 5. As the freeze wall was expanded, the inner connecting freeze walls were decommissioned in order to recover the ore originally sterilized by active freeze holes. Mining is near completion in Panels 1-3 and the majority of the remaining Zone 2 Proven Reserves are in Panel 5. Raisebore mining is currently in use in the main part of the orebody.

Drill and blast stoping is planned for remnant cleanup along the lower eastern fringe of the orebody. This area is currently classified as probable as detailed mine plans have yet to be completed.

Zone 4 Central Lower (Proven): Zone 4 Central Lower mining area is an active production area where mining began in December 2010. Raisebore mining is currently being used with drill and blast stoping planned for remnant cleanup at the eastern fringe of the orebody. As Zone 4 is expanded, the current freeze wall will become obsolete and be decommissioned in order to increase ore recoveries similar to the Zone 2 mine area.

Zone 4 Boxhole Test Area (Proven): The Zone 4 boxhole test area is an active production area where boxhole mining is currently being tested. It was established at the northern edge of Zone 4 in order to permit testing to be carried out under real mining conditions. Mining of this area is expected to be completed in 2014. Mining from this area makes up a very small portion of McArthur's overall production.

Zone 4 North (Proven): The Zone 4 North mining area is under development and is forecasted to be in production in 2014. Freeze drift development has been completed and freeze drilling was approximately 45% complete as of August 31, 2012. Initial production will come from the lower mining area while the ramp access to the upper mining area is established under freeze coverage. Raisebore mining is planned for this mine area.

Zone 4 Central Upper (Proven): Zone 4 Central Upper freeze drift development is scheduled to begin in late 2012. As freeze drilling and development resources are freed up from Zone 4 North, they will be transitioned to Zone 4 Central Upper mining area. Production is scheduled to begin in 2018 using raisebore mining.

Zone 1 (Probable): Access development is currently being established for the Zone 1 mining area in order to gather key geological and geotechnical information in order to establish the freeze drifts and complete the detailed mine design for the area. This mining area is scheduled to come into production in 2019. Raisebore mining is currently planned as the main extraction method with drill and blast stoping planned for remnant cleanup at the eastern and western fringes of the orebody.

Zone B (Probable): Underground exploration access is currently being developed for Zone B. Zone B exploration was initially drilled from surface and the remaining infill drilling for Zone B will be carried out from underground. Zone B is planned to begin production in 2022 using raisebore mining.

Zone 4 South - Panels 1 & 2 (Probable): Drilling, modelling and mine designs updates were recently completed in the Zone 4 South mine area allowing the southern extends of the ore zone to be upgraded to Probable. Zone 4 South is an extension of Zone 4 North and Central; however average grades are 3.5 times lower. Due to the significant strike length, the mining area was divided into panels for scheduling purposes.

Zone 4 South Panel 1 is scheduled to begin production in 2025 followed by Panel 2 in 2030. Raisebore mining is currently planned as the main extraction method with drill and blast stoping planned for remnant cleanup at the eastern and western fringes. As the grades are lower than the average mine grade, an increase in operating drills and active chambers is required to obtain production levels similar to the other mine areas. As this area is scheduled late in the mine life, detailed mine designs will be completed at a later date.

Zone 3 (Probable): The Zone 3 mine area is scheduled to begin production in 2028. Raisebore mining is currently planned as the main extraction method with drill and blast stoping planned for remnant cleanup at the southern fringe of the orebody. As this area is scheduled late in the mine life, detailed mine designs will be completed at a later date.

17 RECOVERY METHODS

17.1 Overview

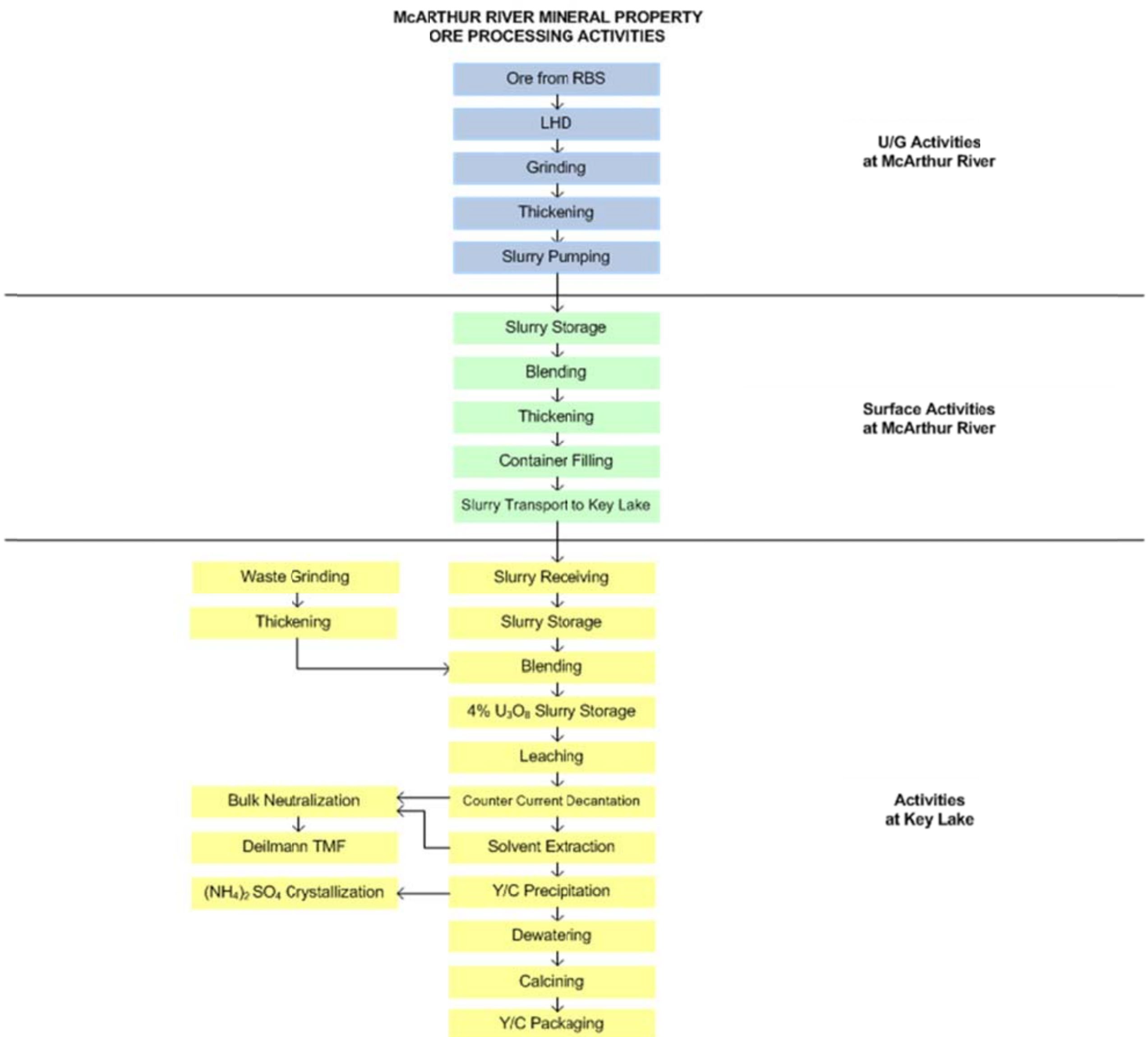
McArthur River ore is processed at two locations. Initially, size reduction is conducted underground at McArthur River and the resulting finely ground ore is pumped to surface and transported to Key Lake Operation as a 50% solids slurry at an average grade of 15% U_3O_8. The slurry is temporarily stored 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.

17.2 McArthur River Ore Processing Activities – Block Flow Sheet

Initial processing of the ore produced by the mining system occurs underground and includes grinding, density control and water handling circuits. For the underground processing, the finely ground, high density ore slurry is pumped to surface storage tanks after which it is then blended, thickened and loaded into truck mounted containers for delivery to Key Lake. Contaminated water from underground, after being recycled to the maximum extent, is pumped to surface and treated in a two stage treatment plant and the excess, above the demand for recycled treated water, is then released to the environment.

A high level operational flow sheet for ore processing activities is shown in Figure 17-1.

Figure 17-1: McArthur River Ore Processing Activities – Flow Sheet



17.2.1 McArthur River Flow Sheet

Mined ore in the form of raisebore cuttings is either fed directly to the underground grinding circuit or stockpiled underground in coarse ore storage. The ore is transferred by LHD to a grizzly covered hopper. A rock breaker mounted over the hopper is used to reduce the oversize material until it passes through the grizzly screen. Grizzly undersize material is fed by belt conveyor to a SAG mill located on the 640 m level. The grinding circuit operates at 13.5 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 25% 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 20 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 within the mining process 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.

17.3 Key Lake Processing

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 Mlbs U_3O_8 with mill ore throughput constrained to approximately 1,000 dry metric tonnes per day. Throughput was later increased to 14 Mlbs 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 tailing 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 aspiration from the truck mounted containers. The high grade slurry is blended to a nominal 4% U_3O_8 mill feed for radiation protection purposes, using uranium-bearing mineralized waste (overburden material from the original Deilmann and Gaertner open pit mines). This mineralized waste is processed through the Key Lake crushing and grinding plant. The blended slurry is pumped to the Key Lake mill where the uranium is recovered as a calcined yellowcake grading 98.7% U_3O_8 on average.

The current licensed maximum annual production rate of 18.7 Mlbs U_3O_8 was achieved largely by debottlenecking the product end of the existing plant with minimal additional capital investment required. Cameco currently has flexibility to produce up to 20.4 Mlbs U_3O_8 (100% basis) per year at Key Lake as long as average annual production does not exceed 18.7 Mlbs U_3O_8. If production is lower than 18.7 Mlbs U_3O_8 in any year, Cameco can produce more in future years until the shortfall is recovered. This also gives Cameco flexibility to avoid having to shutdown and restart the mill in cold winter temperatures. See Section 20.3 and 20.4.1 for a discussion of the Key Lake environmental assessment to extend the operational life of the Key Lake mill and establish it as a regional mill, by increasing the tailings capacity and nominal annual production rate to 25 Mlbs U_3O_8.

In 2009, Cameco successfully commissioned the molybdenum and selenium removal circuit. This circuit is located within the existing effluent treatment plant and has successfully removed these elements from the effluent to a level that is believed to be protective of the environment. Further, Cameco has shown that the removal of these elements of concern is thermodynamically controlled, and as such, the annual loading of these elements to the environment is independent of production rates within the mill.

The Key Lake mill is being revitalized to ensure sustained reliable production and to increase uranium production capability. The Key Lake revitalization plan includes upgrading circuits with new technology to simplify operations and improve environmental performance and is described in more detail in Section 17.4. After the mill is revitalized, annual production will primarily depend on mine production.

17.3.1 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 crushing and grinding/blending plant, and the reverse osmosis plant are located adjacent to each other, between the two open pits approximately two km 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
- 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 aspiration system and pumped to one of four large air agitated slurry storage pachuca tanks. High grade slurry is pumped from a pachuca to the blending tank located in the crushing and grinding plant. There it is mixed with low grade slurry prepared by grinding gravity concentrated 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 leaching 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. In addition to reducing the radiation exposure in the mill, the dilution of the high grade ore serves two other purposes: recovery of uranium from the low grade material; and final disposal of the low grade waste.

Sulphuric acid produced on site by burning/converting sulphur is used to leach uranium, along with various impurities, from the host ore in a single stage atmospheric leach circuit. At the time of this report, the existing high pressure (540 kPa) autoclave secondary leaching circuit is on stand-by as the current ore being milled is amenable to leaching at atmospheric pressure. The slurry is heated to a target temperature of 60° C and nearly pure oxygen, produced on site, is injected into the leach vessels to oxidize the uranium minerals and thereby permit uranium dissolution. Approximately 99.5% of the uranium and varying percentages of the impurities contained in the ore enter the leach 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 Deilmann TMF 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, the 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. The waste solution (raffinate) containing the impurities is pumped to the bulk neutralization plant for treatment and disposal. The organic solvent, loaded with uranium, is contacted with ammonia in ammonium sulphate solution, causing the uranium to transfer back to a highly concentrated aqueous phase known as loaded strip solution. Special treatment circuits are available to deal with problem impurity elements such as arsenic, molybdenum and selenium that tend to follow the uranium through the solvent extraction process.

Using ammonia, uranium is precipitated from loaded strip solution in the yellowcake plant as ammonium diuranate. The precipitate is dewatered in a thickener followed by a centrifuge then calcined to U_3O_8 in a multi hearth furnace at 840^o C. The final calcined product is packed in 200 litre drums for shipment to refineries around the world. Excess ammonium sulphate is recovered in a crystallization circuit by evaporating the water and drying the resulting by-product, which is sold locally for use as a high purity fertilizer.

Contaminated water from the dewatering system associated with the depleted Gaertner and Deilmann open pits at Key Lake is treated in a reverse osmosis plant with permeate released to the environment. Reject water from the reverse osmosis plant is sent to the bulk neutralization plant where all other site aqueous waste streams are neutralised with lime to precipitate dissolved impurities. The resulting solids, as a thick slurry, are combined with the neutralized leach residues and pumped to the Deilmann TMF for final disposal. Treated water is sampled and released to one of four monitoring ponds. The sample is analysed at the Key Lake analytical laboratory for various regulated contaminants. If all federal and provincial regulations are met, the treated water is released to the environment. If not, the pond is recycled through the bulk neutralization plant until the treated effluent becomes suitable for release.

For a discussion of regulatory approvals associated with the Key Lake extension project and tailings management, see Section 20.3 and Section 20.4, respectively.

17.4 Revitalization at Key Lake

The original Key Lake milling facilities and related infrastructure have been in service for nearly thirty years. In late 2006, Cameco initiated a strategic plan to revitalize the Key Lake facilities in order to ensure that the mill would be able to process McArthur River's Mineral Reserves for the next thirty years. 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 25 Mlbs U_3O_8 per year.

The existing acid, steam and oxygen plants have been replaced with higher capacity facilities located east of the existing mill terrace. The newly constructed acid, steam and oxygen plants are sufficient for the Key Lake mill to produce up to 25 Mlbs U_3O_8 per year.

The mill revitalization plan will now focus on the product-end of the mill; that is, the SX, ammonium sulphate crystallization and calcining circuits. The following mill related changes are expected to be implemented at Key Lake:

- the solvent extraction mixer settlers will be modified to improve solution flows and increase capacity. Results from testing how the Vibratory Shear Enhanced Processing (VSEP) waste stream will be processed are currently pending. Once test results are available, a decision will be made regarding installation of the VSEP equipment. The capacity of solvent expansion process will be confirmed when all modifications possible are complete. If capacity is insufficient, a building annex will be added to house additional mixer settlers;
- the ammonium sulphate by-product process will either be upgraded or replaced. A prefeasibility study is underway to determine the preferred option; and
- direct fired calcining in a multi-hearth furnace will be replaced by an electrically heated rotary kiln. Best available scrubber technology will be implemented as well to control particulate and SO_2 emissions.

In addition to the Key Lake mill facility changes described above, revitalization at Key Lake is expected to include replacing and upgrading electrical services as needed. The balance of the Key Lake revitalization plan infrastructure improvements are expected to be complete by 2016.

17.5 Mill Recovery

For production scheduling purposes, an overall uranium process recovery of 98.7% has been used. The processing of the McArthur River ore is described further in Section 13.

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

18 PROJECT INFRASTRUCTURE

The McArthur River mine site contains all the necessary services and facilities to operate a remote site and underground mine

18.1 Surface Infrastructure

Surface infrastructure at the site consists of the following:

- An Airstrip and related facilities
- Communication Tower
- Main Camp and Contractor Trailers for housing of personal.
- Recreation Facilities
- Sewage Treatment Lagoons
- Potable Water Treatment Plant
- Landfill Facility
- Administration Buildings
- Water Distribution Systems including Fire Water
- Waste Water Treatment Facilities
- Water Collection & Treatment Ponds
- Lined Waste Storage Pads
- Shops and Warehouses
- Main Ventilation System including Intake Fans, Heaters and Exhaust Fans
- Propane Storage and Distribution System
- Concrete Batch Plant
- Fuel Storage
- Shaft Head Frames and Hoist Houses
- Freeze Plant
- Ore Slurry Load Out Facility
- Core Logging and Storage Facility
- Electrical Substations and Distribution
- Backup Electrical Generators

18.2 Shaft Services

The McArthur River underground mine has three shafts, Pollock Shaft (Shaft 1), Shaft 2 and Shaft 3 that connect the underground workings to surface.

Pollock Shaft (Shaft 1)

Shaft 1 is the main egress into the mine for both men and materials. It is a 5.5 m diameter concrete line shaft serviced by a single deck 28 person main cage, an auxiliary 6 person cage and an 8 ton skip. Mine services feeding the underground through Shaft 1 consist of the following:

- Slick Lines
- Dewatering Lines
- Electrical Lines
- Compressed Air Line
- Brine Lines

Shaft 2

Shaft 2 does not have any hoisting infrastructure and its main purpose is to serve as the ventilation exhaust shaft for the mine. It is a 6.1 m diameter concrete lined shaft with a non-maintained ladder man way to surface. Since the man way is not maintained it is not considered an emergency egress route from the mine.

There are no active mine services feeding the underground through Shaft 2; however, there are two abandoned 8-inch slick lines and 52-inch rigid vent ducting that are no longer used. Studies are currently underway to determine the feasibility of removing these services.

Shaft 3

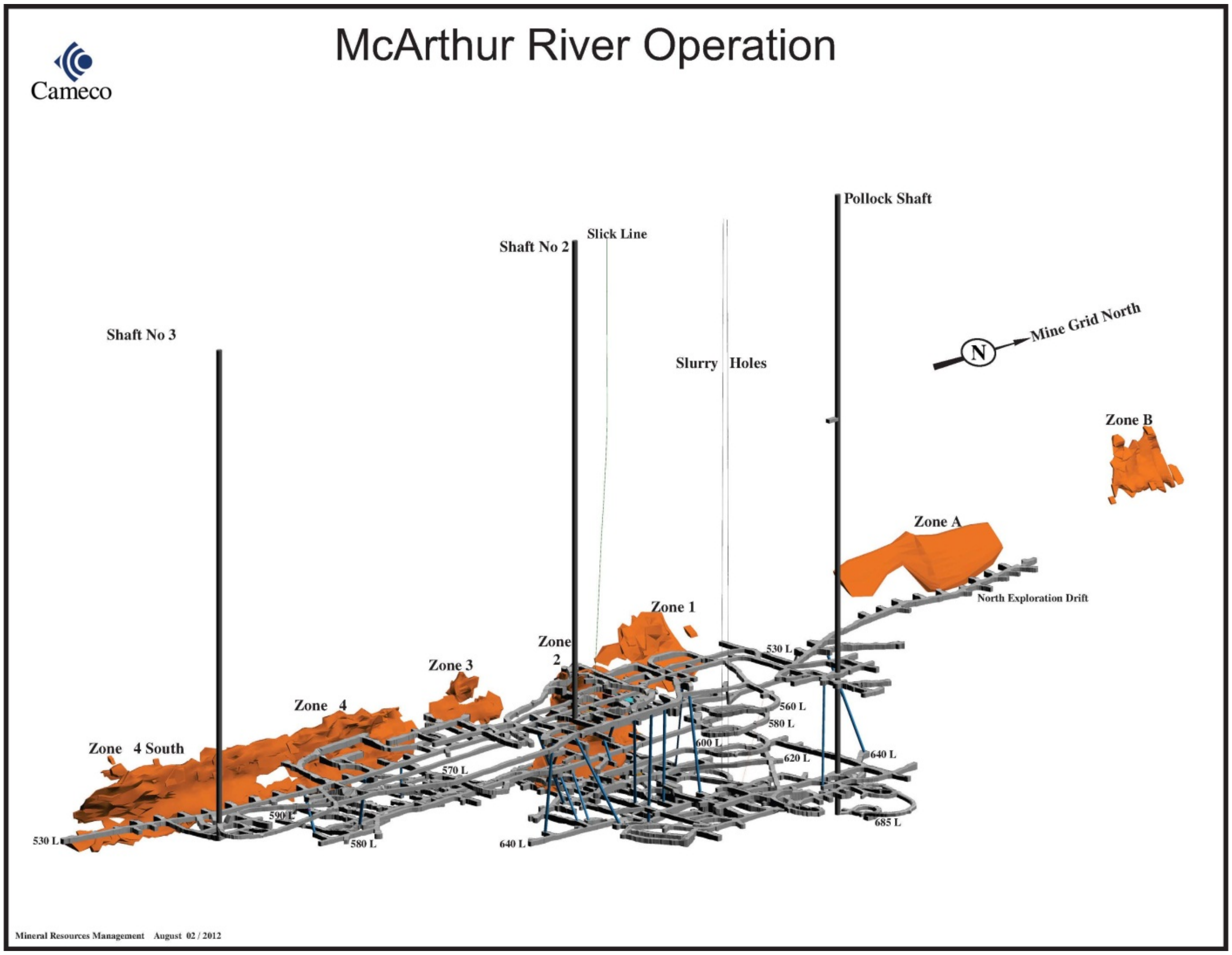
Shaft 3 is the emergency egress from the mine, with a conveyance and a manway. It is a 6.1 m diameter concrete line shaft serviced by a six person auxiliary cage, a Galloway work platform and a material hoist. Mine services feeding the underground through Shaft 3 consist of the following:

- Slick Lines
- Dewatering Lines
- Electrical Lines
- Compressed Air Lines

18.3 General Underground Mine Infrastructure

The McArthur River mine has 11 levels which consist of two main levels (530 m level and 640 m level) and 9 sublevels. The main levels have full service cage access to Shaft 1 where men and materials can be moved into and out of the mine. The levels are connected by an internal ramp system which allows the mobile equipment to move throughout the mine. Figure 18.1 shows the general mine layout.

Figure 18-1: McArthur River Mine Layout



The underground infrastructure consists of all the necessary facilities to operating an underground mine which consists of the following infrastructure and facilities:

- Refuge Stations
- Shops & Workstations
- Material Storages
- Ore & Waste Handling and Storages Systems
- Underground Communication Systems
- Compressed Air Distribution System
- Heater Exchanges and Brine Distribution Systems
- Mine Water Storage Dams and Distribution System
- Water Collection Sumps & Settling Cones
- Mine Dewatering Stations
- Electrical Substations and Distribution
- Auxiliary Ventilation Systems
- Underground Fuel Bays

- Underground Explosive Storage
- Underground Ore Processing Facility (SAG Mill, Thickener, Wirth Pumps)

18.4 Infrastructure Expansion

18.4.1 Mine Ventilation

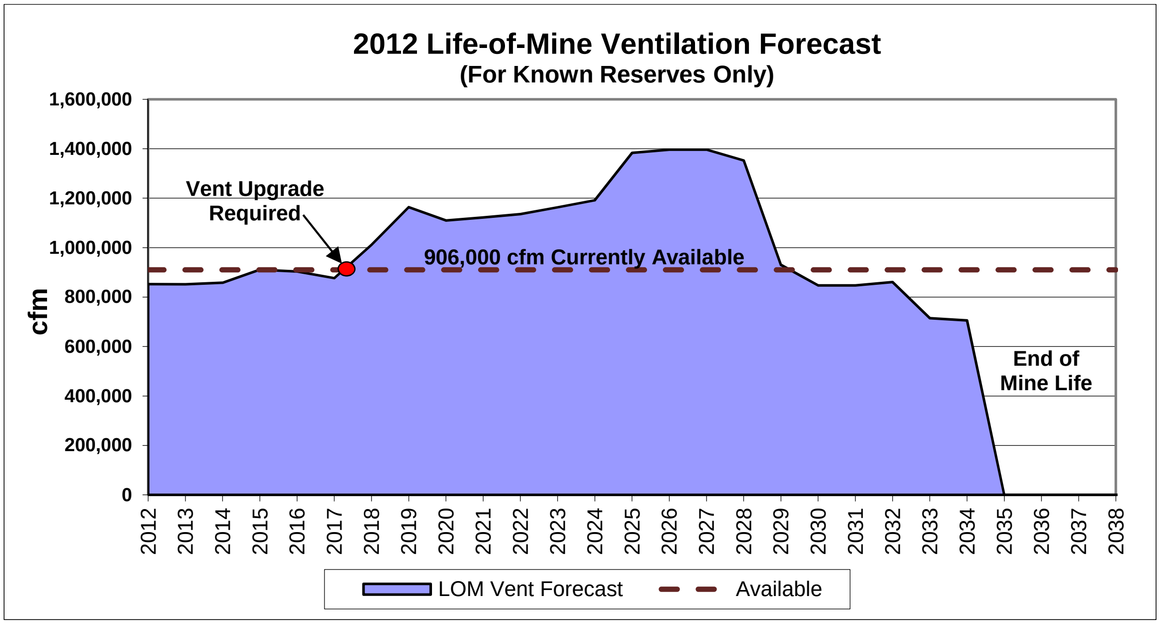
The McArthur River mine is negatively ventilated by two 900 HP surface exhaust fans located at Shaft 2 and two 500 HP surface exhaust fans at Shaft 3. The current capacity of this system is approximately 428 m^3/s (906,000 cfm).

As the mine becomes larger and work activities increase to execute the life of mine plan, ventilation demand also increases. Ventilation modelling has shown that the mine is close to the practical ventilation limit utilizing the existing three shafts so a fourth ventilation shaft will be required. The fourth shaft allows ventilation to be expanded while maintaining safe shaft velocities for personnel and minimizing the electrical load required to achieve the ventilation increase.

The current ventilation demand forecast estimates that the new ventilation shaft will be required by the end of 2017 (See Figure 18-2) in order to achieve the current proposed life of mine schedule.

The new Shaft 4 is planned to be located at the northern end of mine and will be fully integrated with the existing ventilation system. Project completion for Shaft 4 is scheduled for the end of 2017 and project optimization will continue as plans advance.

Figure 18-2: Life of Mine Ventilation Forecast Based on Current Mineral Reserves



18.4.2 Electrical Supply and Distribution

The McArthur River mine site receives its electrical power from the provincial grid via the I2P line. The power is transformed to 4,160 V and distributed to the mine site. Average site load is 10 MWA in the summer and 12 MWA in the winter. The current Saskatchewan Power service contract is for 15 MVA supply.

In order to support the life of mine plan, electrical expansion is required which consists of the following:

- **New 138KV Substation:** The site electrical demand is approaching the capacity of the current substation. In order to ensure power is available for future infrastructure expansions a new substation is required. Site clearing has begun with completion of the substation scheduled at the end of 2014.

- **Back-Up Power General Expansion:** The site currently has 14.3 MW of back-up generation. As the sites electrical load expands, the back-up generation will be expanded accordingly in stages in order to maintain operations during power interruptions.

- **Site Electrical Distribution:** The site electrical distribution system will be expanded as required to feed power to the future underground work areas and expanded surface and underground facilities.

- **Site Power Supply:** Saskatchewan Power is constructing a new transmission line to northern Saskatchewan with completion expected at the end of 2014. This increased supply capacity to the mine site is critical in order to meet future demand.

There is currently a predicted supply/demand gap at the McArthur River mine site in 2014. Alternative power supply sources such as diesel generation are currently being evaluated in conjunction with power conservation in order to determine the best course of action to minimize schedule impacts.

18.4.3 Freeze Plant & Brine Distribution System

Freezing is provided by an 800 t ammonia freeze plant located on surface which circulates sub-zero calcium chloride brine in the primary loop from the plant to the 530 m level via Shaft 1. Heat exchangers on the 530 m level provide the interface between the primary/secondary and secondary/tertiary loops. From the heat exchangers, the brine is then distributed to the freeze areas on a low pressure circuit to the freeze holes.

Both freeze plant and distribution systems will have to be expanded as new mining areas are developed and brought into production. Freeze plant capacity will be expanded in three stages as follows:

- **Expansion of the Existing Freeze Plant:** Expansion of the existing freeze plant from 800 t to 1,300 t is currently in progress and is expected to be completed at the end of 2013. This expanded capacity will be sufficient to meet or exceed the ground freezing requirements for Zone 4 North and Zone 4 Central.

- **South Freeze Plant:** A 1,000 t freeze plant is planned for the south mining areas and is scheduled to be completed by 2017. This freeze plant will allow load from Zone 4 to be transferred from the existing freeze plant to the south freeze plant, which in turn frees up capacity for Zone 1 and 3 on the existing freeze plant.

- **North Freeze Plant:** A 1,250 t freeze plant is planned for the north mining areas and is scheduled to be completed by 2020. Final sizing will be done after the completion of Zone A delineation drilling.

The underground distribution systems to the mining areas will be expanded through piping and heat exchanger additions as required.

18.4.4 Surface Water Supply

Water supply for surface industrial, fire and potable water use is currently drawn from Toby Lake and is regulated through the Saskatchewan Water Shed Authority. The water is pumped from the lake and stored in two tanks on a centrally located drumlin and gravity fed to the sites distribution system.

Industrial water supply currently consists of 60% recycle water with the balance being made up from Toby Lake. In order to eliminate the need for drawing industrial water from Toby Lake, the Shaft 3 Industrial water project was initiated in order to redirect, store and use the clean Shaft 3 water for surface industrial usage. This initiative is expected to reduce water drawn from Toby Lake by +70%. This project was begun in 2012 and is expected to be completed in 2013.

18.4.5 Underground Mine Water Supply

Shaft water (water leaking into the shafts from the sandstone formation) provides the underground operation with its process water. No surface water is sent underground. The water is collected via shaft water rings in Shafts 1 and 3 and at the bottom of Shaft 2. The water is pumped or directed to the fresh water distribution dams and then distribution throughout the mine with the use of pumps.

The mine currently has sufficient water supply to meet its current and future water needs. Distribution lines have been recently upgraded in order to improve flow and pressure to the active work areas and the underground process water storage is currently being expanded to decrease water supply interruptions during peak water demand.

18.4.6 Mine Dewatering

A mine water handling strategy has been developed that includes a minimum dewatering capacity standard designed to handle normal background water combined with an estimated maximum sustained inflow. The predicted future water background levels and dewatering requirements are reviewed and updated annually.

Based on the current average background inflow into the mine, a minimum peak dewatering capacity of 1,560 m^3/h is required. The current peak dewatering capacity available is 1,885 m^3/h as outlined in Table 18-1.

Table 18-1: Peak Dewatering Capacity as of August 31, 2012

Location	Dam	Pump	Operational (m^3/h)	Emergency(1) (m^3/h)	Comments
Shaft 1	Main Dewatering Dam	Weir 1	125	125	Operating
		Weir 2	120	120	Operating
		Weir 3	120	120	Operating
	8500N Fresh Water	Weir 4	125	125	Operating
		Weir 5	135	135	Operating
Shaft 3	Upper M&P Dam	M&P 1	-	210	Contingency
		M&P 2	-	210	Contingency
		M&P 3	-	210	Contingency
		M&P 4	-	210	Contingency
	Fresh Water Dam	Weir 6	65	145[2]	Operating (dewaters Shaft 3 fresh water only during normal operations).
		Weir 7	-	145[2]	Contingency (serves as a redundant pump to Weir 6 during normal operations)
640 m Level	Thickeners	Wirth 1	-	65[3]	Contingency (serves as ore slurry pump during normal operations)
		Wirth 2	-	65[3]	Contingency (serves as ore slurry pump during normal operations)
		Total	**690**	**1,885**	

Notes: (1) The peak dewatering capacity is the maximum dewatering capacity that could be achieved with all pumps running and minimum scale of dewatering lines.
(2) Must convert fresh water dam to dirty water to obtain 145 m^3/h emergency capacity.
(3) Must covert from slurry to water pumping to obtain 65 m^3/h emergency capacity.

In order to further improve the dewatering system, a dewatering capacity increase is planned in 2015. This expansion is for both operational and contingency purposes and is made up of the following:

- A 640 m level inflow collection sump and 660 m level contingency water transfer station for the future north mine areas. The water transfer station will pump water to the main dewatering stations on the 530 m level.

- The installation of a second main dewatering station with approximately 600 m^3/h operational capacity. This system will allow improved cleaning and maintenance of the existing dewatering system and in an emergency inflow situation, eliminate the need to rely on the freshwater dams and the slurry pumps for dewatering capacity. It is sized to meet the predicted future dewatering requirements.

18.4.7 Water Treatment

Contaminated water from both underground and surface is sent to the collection ponds which act as surge capacity for the water treatment plant. Contaminated water is treated in the mine water treatment facilities. These facilities include the primary/secondary water treatment plant and the contingency water treatment system. Each of these facilities utilizes chemical precipitation to remove contaminants in the water. A total treatment design capacity of up to 1,500 m^3/h is currently available, 750 m^3/h in the primary/secondary treatment plant and 750 m^3/h in the contingency water system.

Primary water treatment is a low pH treatment in order to promote the formation of an iron/molybdenum precipitate. Due to limited capacity of this system (approximately 60 m^3/h) only the more highly contaminated mill process water is sent through this treatment process.

Secondary water treatment is a high pH treatment that precipitates radium and other metals and removes solids from contaminated water, which is then fed to the clarifier and polishing sand filters. Treated water is then stored in the monitoring ponds and assayed to ensure the water quality is within the release criteria before the water is discharged to the environment.

The contingency water treatment system is designed to handle and treat inflow water that exceeds the treatment capacity of the primary/secondary water treatment plant. It is a pond-based chemical precipitation contingency treatment system similar to what was used to treat the 2003 inflow water. This is a contingency system only and is tested on yearly basis to ensure operational readiness.

A new water treatment plant is currently planned to replace the existing plant by 2017. The capital cost estimate includes provisions for a new treatment facility that will utilize chemical precipitation and have 750 m^3/h high pH capacity followed by 750 m^3/h low pH capacity. In the event of an inflow, the low pH system can be converted to high pH treatment which would then increase the treatment capacity to 1,500 m^3/h. The main reasons for the water treatment expansion are the following:

- to reduce the risks associated with future operating licence approvals, production increase approvals and possible future regulatory change; and
- to increase the site's total treatment capacity to 2,250 m^3/h to meet the predicted treatment requirements for future background water combined with an estimated maximum sustained inflow;
- to reduce the reliance on the contingency water treatment system;
- to demonstrate continuous improvement and environmental leadership by further improving the effluent water quality discharged to the environment; and
- to reduce long-term environmental impact risks.

18.4.8 Batch Plant & Concrete Distribution System

A surface batch plant is used to provide the underground with its concrete and shotcrete requirements as well as for surface construction projects. Concrete is used for backfill, tight filling of drifts, radiation shielding and for construction purposes. Shotcrete is used for both ground support and radiation shielding.

As the production plan is advanced and Cameco transitions into lower grade mining areas, both the distribution systems and batch plant capacity are expected to be expanded. Surface slick lines in both the north and south and an upgraded or new batch plant are expected to be required in approximately 2021.

18.4.9 Site Accommodations

In order to house the workforce required to maintain production and expand the mine, a 252 permanent camp expansion is currently in progress and is expected to be completed at the end of 2012. This camp expansion will ensure that sufficient housing facilities are available for the permanent workforce, long term contractors and short term contractors.

18.4.10 Maintenance Facilities

In order to better support the increased site activities, a maintenance facilities expansion is planned with a scheduled completion date of 2019. This expansion will include a new stand alone shop complex with offices and warehouse storage.

For a discussion of tailings management, McArthur River waste rock disposal and Key Lake special waste disposal, see Sections 20.4.1, 20.4.2 and 20.4.3, respectively.

19 MARKET STUDIES AND CONTRACTS

19.1 Markets

19.1.1 Overview

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

Uranium Demand

The demand for U_3O_8 is directly linked to the level of electricity generated by nuclear power plants. World uranium consumption has increased from approximately 75 Mlbs U_3O_8 in 1980 to a projected 165 Mlbs U_3O_8 in 2012.

Uranium Supply

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

Mine Production

The uranium production industry is international in scope with a small number of companies operating in relatively few countries. In 2011, world mine production was estimated at 142 Mlbs U_3O_8.

In 2011, an estimated 48% of world mine production was marketed by three producers and 78% of estimated world production was sourced from five countries. The 2011 estimated world production is shown in Table 19-1.

Table 19-1: 2011 World Uranium Production

Producer*	M lbs U_3O_8	% of World
KazAtomProm	23	16%
AREVA	23	16%
Cameco	22	16%
ARMZ/Uranium One	18	13%
Rio Tinto Uranium	11	8%
BHP Billiton	9	6%
Navoi Mining	8	5%
Paladin Energy	6	4%
Others	22	16%
Total	**142**	**100%**

Based on Marketing Share of Production

Country	M lbs U_3O_8	% of World
Kazakhstan	51	36%
Canada	24	17%
Australia	16	11%
Niger	11	8%
Namibia	8	6%
Uzbekistan	8	5%
Russia	8	5%
United States	4	3%
Others*	13	9%
Total	**142**	**100%**

*Others: Brazil, China, Czech Republic, France, Germany, India, Malawi, Pakistan, Romania, South Africa, Ukraine

Source: Cameco

Uranium Markets and Prices

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

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

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

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

Uranium Spot Market

The industry average spot price (TradeTech and UxC) on August 31, 2012 was US$48.25/lb U_3O_8, down 7% from US$51.88/lb U_3O_8 on December 31, 2011.

Long-Term Uranium Market

The industry average long-term price (TradeTech and UxC) on August 31, 2012 was US$60.25/lb U_3O_8, down 3% from US$62.00/lb U_3O_8 on December 31, 2011.

19.1.2 Cameco Market Studies and Analyses

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

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

19.2 Material Contracts for Property Development

There are no contracts that are material to Cameco for the development of McArthur River other than the collective agreement covering the unionized employees at McArthur River described in Section 19.2.1 below.

Section 19.2.2 below contains a description of the toll-milling contract in place for McArthur River ore.

Section 19.2.3 below contains a description of Cameco's uranium sales contract portfolio.

19.2.1 Labour Relations

Cameco has unionized employees at its McArthur River mine and Key Lake mill. The collective agreement covering these unionized employees will expire December 31, 2013.

19.2.2 Toll Milling Contract

The KLJV is operated by Cameco and is owned by Cameco (83 1/3%) and AREVA (16 2/3%).

In June of 1999, the KLJV entered into a toll milling agreement with AREVA for the processing of all of AREVA's share of McArthur River ore at the Key Lake mill. The terms of the agreement (as amended in January 2001) include the following:

- processing at cost plus a toll milling fee; and
- the KLJV owners are responsible for decommissioning the Key Lake mill, including the costs of any tailing management associated with milling AREVA's McArthur River ore.

With the UEM distribution described in Section 6.1, the toll milling agreement was amended as follows:

- the fees and expenses related to AREVA's pro-rata share of ore produced just before the UEM distribution (16.234% – the first ore stream) have not changed. AREVA is not responsible for any capital or decommissioning costs related to the first ore stream.
- the fees and expenses related to AREVA's pro-rata share of ore produced as a result of the UEM distribution (an additional 13.961% – the second ore stream) have not changed. AREVA's responsibility for capital and decommissioning costs related to the second ore stream are, however, as a KLJV owner under the original agreement.

The agreement was amended again in 2011 and now requires:

- milling of the first ore stream at the Key Lake mill until May 31, 2028; and
- milling of the second ore stream at the Key Lake mill for the entire life of the McArthur River Operation.

Cameco's share of McArthur River ore is also milled at Key Lake, but Cameco does not have a formal toll milling agreement with the KLJV.

19.2.3 Uranium Sales Contracts

Uranium Sales Contracts Portfolio

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

A majority of Cameco's long term uranium sales contracts contain supply interruption provisions which allow Cameco to reduce, defer or terminate deliveries in the event of any shortfall in planned production or deliveries of purchases under Cameco's agreement to purchase highly enriched uranium from JSC Techsnabexport.

Impact of Uranium Sales Contracts on McArthur River Economic Analysis

Uranium contract terms generally reflect market conditions when the contracts are negotiated. After a contract negotiation is accepted, deliveries under a long-term contract generally do not begin for several years. Cameco believes the terms of its long-term uranium sales contracts generally reflect industry norms.

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

A spot price projection of US$50.00/lb U_3O_8 in 2012 increasing to US$60.00/lb U_3O_8 in 2016 onwards has been incorporated into the realized price projection for the purpose of the economic analysis. The current price projection starts with a price reflective of the year-to-date industry average spot price in 2012 and gradually increases to US$60.00/lb U_3O_8, which is a level that is consistent with various independent forecasts of prices and supply/demand fundamentals. To the extent the independent forecasts did not extend their projections to cover the entire expected mine life of McArthur River, the projections have been extrapolated forward to the end of the anticipated mine life.

Cameco has historically sold U_3O_8 under long-term contracts with its customers, at prices that reflect the market conditions at the time the contract is accepted. Cameco has committed a significant quantity of its future production and purchased material to be delivered through its existing portfolio of long-term sales contracts. The remaining future production will be sold under yet to be negotiated arrangements. For purposes of the economic analysis, realized price projections were derived from a combination of spot price and corresponding term price assumptions. Based on the historical relationship between spot and term prices, Cameco assumed term prices would be 15% higher than spot prices. For Cameco's committed sales volumes, the spot and the term price assumptions were applied in accordance with the terms of the uranium sales contracts. For uncommitted sales volumes, the same price assumptions were applied using a spot-to-term price ratio of 60:40.

Table 19-2 outlines the projected average realized prices, taking into account Cameco's current level of sales commitments and the independent spot price projections. The price projections are stated in constant 2012 dollars. The economic analysis assumes an average realized price of \$60.92/lb U_3O_8.

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

Table 19-2: Projected Average U_3O_8 Sales Prices

Price Assumptions	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
McArthur River Average Price $US/lb	48	53	55	56	59	59	60	61	61	63	63	63
McArthur River Average Price $Cdn/lb	**48**	**53**	**55**	**56**	**59**	**59**	**60**	**61**	**61**	**63**	**63**	**63**
Exchange Rate	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Price Assumptions	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
McArthur River Average Price $US/lb	64	64	64	64	64	64	64	64	64	64	64
McArthur River Average Price $Cdn/lb	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**
Exchange Rate	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

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

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Regulatory Framework

The McArthur River and Key Lake Operations are both considered to be nuclear facilities and as such, primary regulatory authority resides with the federal government and its agency, the CNSC. The nuclear industry is a closely regulated industry whereby any significant change/modification to the process or facility requires prior regulatory approval. The level of assessment of each potential change or modification depends on the magnitude of the proposed change. Changes can require full environmental assessments prior to receiving regulatory approval.

Provincial regulatory authority is generally described in the surface lease agreement between the Province of Saskatchewan and each operation. In many cases, there is coordination amongst the federal and provincial regulatory agencies, but each agency retains responsibility for administering its own regulations, approvals, licences and permits where required. The main regulatory agencies that issue permits/approvals and inspect these operations are**:** the CNSC (federal), the Mine Safety Unit of Saskatchewan, Ministry of Labour Relations and Workplace Safety (provincial) and the SMOE (provincial). Other agencies that have an interest with respect to environmental monitoring programs and activities that may impact water ways are Environment Canada (federal) and the Department of Fisheries and Oceans Canada (federal). Environment Canada, specifically is responsible for administering the federal Metal Mines Effluent Regulations (MMER) and approves environmental effects monitoring (EEM) programs required under MMER.

20.2 Licences and Permits

20.2.1 McArthur River Operation

There are three key permits that are required to operate the mine. Cameco holds a “Uranium Mine Facility Operating Licence” from the CNSC an “Approval to Operate Pollutant Control Facilities” from the SMOE and a “Water Rights Licence and Approval to Operate Work” from the Saskatchewan Watershed Authority. These permits are current. The CNSC licence was renewed for a five year term in 2008 and expires on October 31, 2013. The SMOE Approval to Operate Pollutant Control Facilities was renewed in 2009 and expires on October 31, 2014. The Saskatchewan Watershed Authority permit was obtained in 1993 and was last amended in November 2011. It is valid for an undefined term.

20.2.2 Key Lake Operation

The Key Lake Operation is regulated in a similar manner as the McArthur River Operation and as such has regulatory obligations to both the federal and provincial governments. There are two key permits that 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" from the 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 renewal process for this licence will be started at the end of 2012. The SMOE Approval to Operate Pollutant Control Facilities was renewed in 2009 and expires on November 30, 2014.

Three licence conditions were included in the operating licence as follows: completion of the molybdenum and selenium in effluent reduction or control process; an implementation plan for Deilmann TMF slope stabilization; and the development of a wasterock management plan and a schedule for the Deilmann north wasterock pile. The water treatment system was modified and is now effectively controlling molybdenum and selenium to the satisfaction of the regulators, the multi-year Deilmann TMF slope stabilization plan was developed and is currently being executed and the plan for addressing the Deilmann north wasterock pile was accepted by the CNSC.

20.3 Environmental Assessment History

The Key Lake and McArthur River Operations and all associated infrastructure have been the subject of several EAs and detailed environmental monitoring programs.

In regards to the Key Lake Operation, the EA process began in 1979, when the Key Lake Mining Corporation, a Cameco predecessor, filed an EIS with federal and provincial regulatory agencies. The EIS review was completed by the Key Lake Board of Inquiry in 1981.

In 1994, a new EIS was filed for the Key Lake Operation that detailed a plan to create a new tailings storage facility in the existing Deilmann open pit and using a sub-aqueous tailings deposition and storage program to fill this new facility (Cameco 1994). Approval for this new approach was obtained in 1995.

In April 1991, the governments of Saskatchewan and Canada established a Joint Panel to assess the environmental and public concerns arising out of three non-Cameco related projects which had filed EISs, and two related Cameco projects, McArthur River and Cigar Lake, which had filed preliminary project proposals. The members of the Joint Panel were appointed in August 1991.

In 1992, as the next step in the EA process, Cameco filed an EIS for the McArthur River Operation with the regulatory agencies to cover off proposed underground exploration activities. The Joint Panel reviewed the EIS and in 1993 recommended that the project be allowed to proceed subject to a series of conditions. All conditions were met and all underground exploration activities were completed.

In 1995, after undertaking the underground exploration work, Cameco submitted an EIS that covered the proposed mining activities at McArthur River while also covering the proposed milling of all McArthur River ore at Key Lake and all associated surface infrastructure. In 1996, an addendum was provided to address a series of questions from the reviewers. Federal and Provincial approval of the EIS was obtained 1997. With the approval of the project by the federal and provincial government, Cameco requested and received approval for construction in 1997.

In 1999, with the completion of construction, the McArthur River Operation received both federal and provincial approvals to operate. Key Lake was also granted approval to receive and process McArthur River ore and waste rock.

As both McArthur River and Key Lake are nuclear facilities operating under CNSC licenses, any significant facility changes or amendments to the facility licences are subject to the requirements of the CEAA and all of its regulations. In Saskatchewan, CEAA activity takes place under the terms of the Saskatchewan Canada Harmonization Agreement. Under the agreement, projects that require an EA by both the government of Canada and the government of Saskatchewan undergo a single assessment, administered cooperatively by both governments.

In 2002, Cameco applied to increase the annual licensed production capacity at both the McArthur River mine and the Key Lake mill to 22 Mlbs U_3O_8 per year compared to the then current annual licensed production capacity of 18.7 Mlbs U_3O_8. This application received ministerial approval from the Province; however, a screening level EA was also required under CEAA, with the CNSC as the responsible authority. The EA was delayed due to discussions with the CNSC regarding how to address local accumulation of molybdenum and trace amounts of selenium in the Key Lake mill downstream environment. The result was that the 22 Mlbs U_3O_8 EA was suspended indefinitely. Cameco modified the water treatment process at the Key Lake mill, which the regulatory agencies have since accepted.

Following the successful implementation of the modified water treatment process at the Key Lake mill, in 2009 and subsequently in 2010, the CNSC amended the operating licence for first the Key Lake mill and then the McArthur River mine, to allow Cameco flexibility in annual licensed production. These amendments allow not only for improved operational management and reliability by avoiding unnecessary plant shutdowns in winter conditions if the nominal annual production has been achieved prior to year end, but also the recovery of previous production shortfalls. As a result, the Key Lake mill can now produce up to 20.4 Mlbs U_3O_8 (7,850 t U) per year while the McArthur River mine can produce up to 21 Mlbs U_3O_8 (8,100 t U) per year, as long as, in each case, average annual production does not exceed 18.7 Mlbs U_3O_8 and there is a shortfall of production based on previous years to recoup. If production is lower than 18.7 Mlbs U_3O_8 in any year, then Cameco can produce more in future years until the shortfall is recovered. The upper bounds of this flexibility were capped based on a review of the existing operational capability of the sites at the time and evaluating those against safety and environmental considerations.

Concurrently with the improvements to the water treatment process at the Key Lake mill, Cameco initiated a separate EA for the Key Lake mill to extend the operational life of the Key Lake mill and establish it as a regional mill, by increasing the tailings capacity and nominal annual production rate to 25 Mlbs U_3O_8.

Subsequently in 2012, with the implementation of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), Cameco was notified by the CNSC that the EA for the proposed increase in production at McArthur River to 22 Mlbs U_3O_8 per year would be transitioned to the CNSC licensing and compliance processes under the authority of the NSCA rather than the federal EA process. Cameco is developing plans to complete the regulatory process for this production increase at McArthur River.

20.4 Environmental Aspects

20.4.1 Tailings Management

There are two tailings management facilities at the Key Lake site. One 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.

The other tailings management facility is located within the Deilmann pit, which was mined out in the 1990s. Tailings from processing McArthur River ore are deposited in the Deilmann TMF. For a discussion of the historic Deilmann TMF, see Section 24.2.

In February of 2009, Cameco received regulatory approval to deposit tailings to a moderately higher elevation in the Deilmann TMF. At current production rates, the approved licensed capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018.

In the past, sloughing of material from the pitwalls has reduced tailings capacity. Studies have shown that stabilizing and reducing water levels in the pit enhances the stability of the pitwalls, which reduces the risk of pitwall sloughing. Cameco has doubled its dewatering treatment capacity, allowing it to reduce the water level in the pit. Controlling the water level is an effective interim measure in managing the further sloughing while work to cut back the slopes for long term stabilization is completed.

In 2009, regulators approved Cameco's plan for the long-term stabilization of the Deilmann TMF pitwalls. Extensive engineering, design and regulatory review followed this approval.

In 2011, Cameco:

- completed the detailed design for the stabilization of the Deilmann TMF pitwalls;
- relocated the infrastructure necessary to allow it to flatten the slope of the pitwalls; and
- continued work on the EA for the Key Lake extension project.

In June 2012, Cameco began to flatten the slope of the Deilmann TMF pitwalls to achieve a more stable slope for the long term stability of the facility. Cameco expects this project will be complete in 2014.

Cameco has assessed options for long-term storage operations at Key Lake including increased production capacity, tailings capacity and consideration of processing other regional ores.

In 2009, guidelines for the Key Lake extension project EA were approved by regulatory agencies to extend the lifespan of the Key Lake Operation. Specifically, Cameco requested that Key Lake be:

- allowed to continue processing of ore from the McArthur River mine and other potential mine developments in the region;
- allowed to increase long term capacity of the Deilmann TMF by increasing the final tailings elevation; and
- allowed to increase annual mill production capacity to 25 Mlbs U_3O_8.

In April 2012, Cameco submitted a draft EIS to the regulators and comments were received. Work is underway to provide responses to these comments and submission of the final EIS is planned for 2013.

As the EA was designated by the SMOE, the changes realized through CEAA 2012 will have no effect to the current process the Key Lake EA is following.

For a further more detailed discussion of the Deilmann TMF, see Section 24.2.

20.4.2 McArthur River Waste Rock Disposal

At the McArthur River Operation, ore and waste rock are managed in contained facilities. Waste rock generated from underground activities is classified as clean, mineralized, or potentially acid generating, and transported on-site to its appropriate storage location. The mineralized waste rock is transferred to a lined storage pad where it is later placed in covered haul trucks for shipment to Key Lake. At the Key Lake Operation the mineralized waste rock is placed on a lined pad where it is later used for blending with the McArthur River ore slurry prior to processing in the mill.

20.4.3 Key Lake Mineralized Waste Rock Disposal

Mineralized waste rock generated from the historical mining activities of Key Lake is referred to as special waste. There are two stockpiles of this special waste material: the Deilmann special waste and the Gaertner special waste stockpiles. Material generated from the mining of the Deilmann pit is called Deilmann special waste and the material generated from the mining of the Gaertner pit is called Gaertner special waste. Both stockpiles are stored on above ground lined pads. Deilmann and Gaertner special wastes are presently being used for blending with McArthur River ore. All of the special waste will be removed and consumed as blend material to manage the mill head grade before the Key Lake site is decommissioned in future.

20.4.4 Environmental Effects Monitoring

Although there are some general temporary disturbances to wildlife, the primary influences on the environment from both the McArthur River and Key Lake Operations are associated with the releases of treated effluent generated from their operation. To a lesser extent, air emissions and airborne particulate material are also capable of potentially influencing the environment.

Comprehensive environmental monitoring programs are in place at the McArthur River and Key Lake Operations to determine the full extent and nature of any environmental effects taking place within the sphere of influence of these facilities. The most significant component of this monitoring is the Environmental Effects Monitoring (EEM) program that Cameco performs and is required under its operating licences. The EEM includes the monitoring of water, fish health, benthic invertebrate monitoring, sediment, fish tissue, plants and animals. It is designed to incorporate the requirements of Environment Canada's Metal Mines Effluent Regulations, CNSC requirements and SMOE requirements. In general terms, the environmental monitoring programs have shown that the environmental effects are generally in line with the predictions contained within the previously completed environmental assessments. Prior to the implementation of equipment to control molybdenum and selenium in the final effluent, the only significant variances, between what was taking place with what was previously predicted, involved the effects that certain dissolved metals (primarily molybdenum and selenium) appeared to be having on the aquatic receiving environment at both the Key Lake and McArthur River Operations. It appeared that molybdenum and selenium present in the effluent streams were creating a small incremental increase in risk to select valued ecosystem components. It should be noted that this incremental change is not expected to cause additional environmental affects beyond those incurred at current operating conditions.

20.4.5 Effluent Quality

Treated effluent from the Key Lake Operation is discharged to Wolf Lake and flows through the David Creek system. The David Creek system from the effluent discharge location, in order, consists of: Wolf Lake, Fox Lake, Yak Creek, David Creek, Unknown Lake, Pyrite Creek and Delta Lake. Delta Lake discharges into the Wheeler River, which flows to Russell Lake. Russell Lake receives flow from both the mine dewatering discharge and the ongoing mill effluent discharge.

At the Key Lake Operation, molybdenum and selenium originate from ore processing. Environmental monitoring has shown that concentrations of molybdenum and selenium in Wolf Lake, Yak Creek, David Creek (downstream of Yak Creek) and Pyrite Creek have begun to exceed their water quality guideline values for these two metals. Molybdenum and selenium concentrations exceeded the guideline values in Delta Lake and Delta Lake outflow. In the Wheeler River, downstream of David Creek, molybdenum and selenium concentrations were comparable to background concentrations.

On 15 December 2006, Cameco submitted the *Key Lake Operation – Action Plan for Selenium and Molybdenum*, which detailed the efforts to be made to limit the potential risk to the environment from releases of selenium and molybdenum from the Key Lake mill effluent treatment system. Phase I of this plan included adding a low pH iron precipitation and solid removal stage to the effluent treatment circuit. Phase II of the plan included increasing the amount of contaminated water treated by the RO plant in order to decrease the volume of water sent to the mill effluent treatment. Phase II would not see any direct reduction in effluent concentration, but would show reduced loading due to reduced flows. Phase III of the plan included re-evaluating the current split mine/mill effluent strategy. In 2007, CNSC granted authorization for Cameco to proceed with Phase I and Phase II of the Action Plan. Cameco has since implemented Phase I of the plan and demonstrated that at this time no further action is necessary.

Notwithstanding the review of membrane technology, optimization of existing treatments systems has been ongoing, resulting in increased Mo and U removal efficiencies, effectively mitigating those potential effects. Cameco continues review and optimize effluent treatment performance.

20.5 Decommissioning and Reclamation

In 2003, Preliminary Decommissioning Plans (PDP) 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. The estimated cost of implementing these

PDP resulted in production of two other associated documents called preliminary decommissioning cost estimates (PDCE) for both Key Lake (Cameco, 2003c) and McArthur River Operations (Cameco, 2003d). Financial assurances to cover the 2003 PDCE for McArthur River and for Key Lake Operations were posted with SMOE in the form of irrevocable standby letters of credit (LOC).

In 2008, as part of the CNSC licence renewal process, these documents underwent extensive review and revision to capture any changes in decommissioning liabilities over the review period. Based on the total estimated decommissioning costs presented and approved in these PDCE by both the CNSC and SMOE, Cameco increased the LOC's posted with the Province of Saskatchewan in 2008 to $120.7M and $36.1M for decommissioning the Key Lake and McArthur River Operations, respectively. These financial assurances represent 100% of the total estimated costs and not Cameco's share of such costs. The PDP and PDCE are currently undergoing review and will be revised accordingly through the CNSC licence renewal process in 2013. As part of the review process, Cameco expects that the PDP and the PDCE will increase. The amount of such increase will be quantified on completion of the review process.

The preliminary decommissioning plans and cost estimates were developed as per the CNSC guide documents (G-219, Decommissioning Planning for Licensed Activities, 2000 and G-206, Financial Guarantees for the Decommissioning of Licensed Activities, 2000). The increases from prior versions reflect changes to the facilities, the significant increase in costs associated with current market conditions in western Canada and the allowance for an escalation factor over the next 5-year review period.

The reviews are triggered when the licenses are renewed at the federal level, or at least every five years as per provincial requirements. This systematic update and review of previous decommissioning plans is designed to capture all changes to known liabilities and improvements in decommissioning as an operation matures.

20.6 Known Environmental Liabilities

The core generic estimates and assumptions made in mine and mill site decommissioning plans which are considered to have the greatest impact on cost to complete the work are as follows:

- Correct understanding of the geochemical and geotechnical properties of waste materials – these properties are used to provide long-term performance modelling estimates of the wastes, and are key to regulatory acceptance of detailed decommissioning plans.

- Degree of required isolation of waste rock piles from leaching by precipitation and groundwater transport.

- Degree of required isolation of tailings from leaching by precipitation and groundwater transport.
- Correct length of any forecasted “pump and treat” period needed to generate acceptable contaminant flux rates from tailings and waste rock.
- Negotiated contaminant loading and concentration limits, along with locations where these criteria apply.
- Cost of “deconstruction” of surface facilities.
- Magnitude of groundwater contamination generated underneath surface facilities during the operating phase that require remediation prior to site release.
- Decommissioning phase environmental assessment costs along with post-release performance verification monitoring costs.
- Correct assumptions regarding the degree of institutional control required for the post-decommissioned site – ranging from on-going perpetual care and maintenance to totally passive controls

Listed below is a description of site-specific assumptions built into the PDPs and PDCEs which are the subject of this technical report.

All known environmental liabilities associated with the McArthur River Operation are discussed in the McArthur River Operation PDP (Cameco, 2008a), and are accounted for within the PDCE (Cameco 2008b). The PDP and PDCEs are conceptual in design and detail. They are developed to address known environmental liabilities of the facility at that time in a ‘decommission tomorrow’ scenario, such that reasonable financial assurance requirements for the benefit of the Crown can be defined. This does not preclude formal regulatory processes which are followed prior to implementing actual decommissioning. Therefore it is possible that following such final approval processes, the liabilities understood in the PDP and PDCE, may vary significantly from the final approved decommissioning. This uncertainty is addressed through the conservatism built into the documents and the regulatory acceptance process. In general, the significant liabilities associated with the McArthur River Operation are accounted for in the PDP and PDCE are as follows:

- Underground facilities and surface shaft installation. The main long term liabilities are primarily from a safety perspective. These are addressed by the capping of the shaft collars. Environmentally there are limited liabilities associated with potential soil contamination, addressed with removal and disposal underground.

- Ancillary facilities such as the shop/office complex, slurry loadout, water treatment plant and residence. Environmental liabilities are associated with potential soil and ground water contamination. These are addressed by removal of contaminated materials and disposal underground, or if appropriate at the Deilmann TMF.

- Mineralized waste and special waste rock piles. The long term environmental liability associated with these piles is groundwater contamination. This would be mitigated in the ‘decommission tomorrow’ scenario through underground disposal.

- Clean waste rock piles and drumlin material from past shaft collaring excavations. The long term environmental liability associated with these piles is erosion impacting surface waters (muskeg) in their immediate area. This is addressed by contouring and stabilizing these piles with natural vegetation. A portion of these piles may also be utilized as a source of fill to promote the establishment of stable drainage courses on the reclaimed development footprint.

- Haul road to Key Lake. As this is a good all weather road, it is not expected that should the McArthur River mine cease to operate that the Province would expect the road to be decommissioned. However, for completeness this liability is carried in the PDP and PDCE. The primary environmental liability would be associated with erosion of the road way, resulting in impacts being realized at various stream crossings along its corridor. Mitigation involves re-vegetation to stabilize these areas and removal of stream crossings (bridges, abutments and culverts).

All known environmental liabilities associated with the Key Lake Operation are discussed in the Key Lake Operation PDP (Cameco, 2008c) and the associated PCDE (Cameco 2008d). In general, the significant liabilities associated with the Key Lake Operation and accounted for in the PDP and PDCE are as follows:

- Above ground tailings management facility (AGTMF). The main long term environmental liability is from contaminant transport via groundwater from the facility, impacting downstream David Creek receiving environment. The PDP addresses this through enhancement of tails properties via a multi-year thawing program and with subsequent installation of engineered covers to limit precipitation infiltration.

- Deilmann TMF. The main long term environmental liability is from contaminant transport via groundwater from the facility, impacting downstream Outlet Creek receiving environment. The PDP addresses this with sub-aqueous sand cover of the tailings mass and other disposed wastes (e.g. from the decommissioning of the mill or problematic waste rock piles), and long term (multi-year) post closure pump and treatment of groundwater in the area.

- Waste rock stockpiles. The main environmental liability is groundwater contamination, and associated contaminant transport impacting the Outlet Creek system. The Key Lake site has three waste rock stockpiles and two stockpiles of special waste containing >0.05 and < 0.19% U_3O_8. Essentially all Key Lake special waste will be deposited directly or milled and co-disposed with tailings into the Deilmann TMF. The conceptual decommissioning plans for the three waste rock piles include to varying degrees pile contouring and revegetation to ensure effective runoff management and infiltration management coupled with focused measures as required to address sources of problematic materials associated with the piles (e.g. use of engineered covers and/or removal to the problematic material to the Deilmann TMF for final disposal) including long term (multi-year) post closure pump and treatment of groundwater in the area.

- Mill and ancillary facilities. The main environmental liabilities associated with these facilities are soil contamination. Mitigation includes demolition of the mill and other associated infrastructure used to support the operation. Contaminated materials will be disposed of in the Deilmann TMF.

21 CAPITAL AND OPERATING COST ESTIMATES

21.1 Capital Cost Estimates

Estimated capital costs to the MRJV include sustaining capital for both McArthur River and Key Lake Operations, as well as underground development at McArthur River, to bring Mineral Reserves into production. The total estimated life of mine capital costs to the MRJV are $3.5 billion. Cameco's share of the total estimated life of mine capital costs is $2.5 billion compared to $1.4 billion in the 2009 Technical Report.

More than 40% of this increase is related to the addition of more than 85 Mlbs U_3O_8 of new forecast production since the 2009 Technical Report and about 15% relates to expenditures required to allow production at a higher rate such as additional ventilation including the sinking of a fourth ventilation shaft. The remainder of the increase is related to expanding the infrastructure to support ongoing and expanded operations and general cost escalation.

In connection with changes to the production schedule, including the incorporation of additional Mineral Reserves described in Section 15, a number of critical mine infrastructure investments are planned. Capital cost estimates include an additional capital investment of approximately $285 million in connection with underground development associated with newly added Mineral Reserves and an additional capital investment of approximately $350 million for freeze installation and distribution costs and dewatering equipment planned for new mining areas.

Additional ventilation costs of approximately $220 million have been included in order to support the entire mine throughout the mine life. Additional ventilation volume will be required by the end of 2017 in order to meet production needs

For McArthur River, the largest component of capital costs in 2013 is mine development work estimated to be about $70.5 million. Other projects include installation of freezing and distribution systems, and work on dewatering equipment and mine ventilation, as well as upgrades to site electrical infrastructure.

For Key Lake, capital costs in the near term include an estimate for revitalization costs of approximately $220 million. Work is also currently underway to increase the capacity of the Deilmann TMF. This work is expected to be complete in 2014.

At Key Lake, mill revitalization is the largest sustaining capital project for 2013 estimated to be approximately $76.2 million. The purpose of this multi-year project is to enhance the mill's capability to produce over the long term. The balance of the Key Lake infrastructure improvements are expected to be complete by 2016.

The estimated total capital costs to the MRJV for McArthur River and Key Lake, broken down by year, are shown in Table 21-1. In 2013, Cameco's share of the estimated capital costs is $235 million.

Table 21-1: McArthur River Capital Cost Forecast by Year

Capital Costs ($Cdn M)	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
McArthur River Mine Development	$ 54.3	$ 70.5	$ 75.9	$ 68.5	$ 70.7	$ 53.5	$ 52.8	$ 58.3	$ 46.6	$ 39.4	$ 42.8	$ 34.1	$ 26.9
McArthur River Mine Capital													
Freeze infrastructure	10.1	20.3	13.2	31.6	32.4	1.7	60.6	22.9	-	0.9	6.0	10.7	5.5
Water management	9.6	12.4	17.4	40.1	59.4	10.0	11.0	1.0	13.7	11.6	-	-	-
Ventilation	0.6	4.2	34.2	62.1	60.2	45.8	28.5	-	-	-	-	-	-
Electrical infrastructure	18.5	62.3	98.3	-	1.5	23.6	1.5	-	1.5	-	1.5	-	2.3
Other mine capital	68.5	35.3	54.9	58.9	47.8	55.8	54.1	80.3	62.0	75.4	48.4	32.5	30.0
Total Mine Capital	107.3	134.5	218.0	192.7	201.3	136.9	155.7	104.2	77.2	87.9	55.9	43.2	37.8
Key Lake Mill Sustaining													
Revitalization	49.7	76.2	55.9	39.0	-	-	-	-	-	-	-	-	-
Mill Capital	30.1	31.9	43.5	38.8	34.9	26.7	33.2	29.3	30.3	29.8	29.7	19.8	29.7
Tailings	29.7	23.6	16.3	0.4	-	0.4	-	0.4	-	-	-	-	-
Total Mill Capital	109.5	131.7	115.7	78.2	34.9	27.1	33.2	29.7	30.3	29.8	29.7	19.8	29.7
Total Capital Costs	**$ 271.1**	**$ 336.7**	**$ 409.6**	**$ 339.4**	**$ 306.9**	**$ 217.5**	**$ 241.7**	**$ 192.2**	**$ 154.1**	**$ 157.1**	**$ 128.4**	**$ 97.1**	**$ 94.4**

Capital Costs ($Cdn M)	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**Total**
McArthur River Mine Development	$ 23.1	$ 13.6	$ 21.9	$ 21.8	$ 1.3	$ 1.1	$ 0.7	$ 0.7	$ 0.7	$ 0.7	$ 779.2
McArthur River Mine Capital											
Freeze infrastructure	-	-	-	0.9	5.7	5.5	-	-	-	-	228.0
Water management	-	-	-	-	-	-	-	-	-	-	186.2
Ventilation	-	-	-	-	-	-	-	-	-	-	235.6
Electrical infrastructure	-	1.5	-	1.5	-	2.3	-	1.5	-	-	217.8
Other mine capital	44.0	30.0	31.9	25.0	21.0	20.0	21.5	16.5	13.5	8.0	935.3
Total Mine Capital	44.0	31.5	31.9	27.4	26.7	27.8	21.5	18.0	13.5	8.0	1,802.9
Key Lake Mill Sustaining											
Revitalization	-	-	-	-	-	-	-	-	-	-	220.8
Mill Capital	29.6	29.7	29.6	29.6	29.6	29.6	29.6	22.2	11.1	8.3	656.6
Tailings	-	-	-	-	-	-	-	-	-	-	70.8
Total Mill Capital	29.6	29.7	29.6	29.6	29.6	29.6	29.6	22.2	11.1	8.3	948.2
Total Capital Costs	**$ 96.7**	**$ 74.8**	**$ 83.4**	**$ 78.8**	**$ 57.6**	**$ 58.5**	**$ 51.8**	**$ 40.9**	**$ 25.3**	**$ 17.0**	**$ 3,530.3**

***** presented as total cost to the McArthur River Joint Venture***

21.2 Operating Cost Estimates

Estimated operating expenditures to be incurred by the MRJV for the underground mining operations and for milling costs are presented in Table 21-2.

Operating costs consist of annual expenditure at McArthur River to mine the ore, process it underground, including grinding, density control and pumping the resulting slurry to surface for transportation to Key Lake.

Operating costs at Key Lake consist of costs for receipt of the slurry, up to and including precipitation of the uranium into yellowcake, including costs of disposal of impurities to the Deilmann TMF. Toll milling revenue has not been included as an offset to operating costs, as it is insignificant over the life of the mine.

Operating costs are estimated to average \$19.23/lb U_3O_8 over the remaining life of the Mineral Reserves only. For the period from 2012 to 2016, operating costs are estimated to average \$17.31/lb U_3O_8. The operating projections are stated in constant 2012 dollars and assume the throughput outlined in the production schedule outlined in Section 16.5.

Table 21-2: McArthur River Operating Cost Forecast by Year

Operating Costs ($Cdn M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
McArthur River Mining													
Site Administration	$ 51.0	$ 52.4	$ 52.8	$ 52.8	$ 52.9	$ 52.9	$ 53.0	$ 53.1	$ 53.1	$ 53.1	$ 53.8	$ 53.8	$ 53.9
Mining Costs	84.1	84.0	84.0	84.3	86.0	81.3	85.4	92.7	91.9	92.2	95.8	97.9	100.1
Process	17.1	17.1	17.0	17.0	17.4	17.3	17.6	17.7	17.9	17.9	18.0	18.0	18.0
Corporate Overhead	14.0	14.7	17.4	16.4	16.8	14.2	14.9	13.7	12.5	12.7	11.9	11.4	11.1
Total Mining Costs	166.2	168.2	171.2	170.5	173.1	165.7	170.9	177.2	175.4	175.9	179.5	181.1	183.1
Key Lake Milling													
Administration	59.1	60.9	61.7	60.2	59.7	58.9	58.4	59.2	58.9	58.9	58.9	58.9	59.2
Milling Costs	87.3	85.7	84.2	84.5	88.5	88.6	92.7	93.4	93.7	93.7	92.9	92.9	92.9
Corporate Overhead	10.4	11.4	10.8	9.7	8.8	8.7	9.0	8.5	8.5	8.5	8.5	8.7	8.5
Total Milling Costs	156.8	158.0	156.7	154.4	157.0	156.2	160.1	161.1	161.1	161.1	160.3	160.5	160.6
Total Operating Costs	**$ 323.0**	**$ 326.2**	**$ 327.9**	**$ 324.9**	**$ 330.1**	**$ 321.9**	**$ 331.0**	**$ 338.3**	**$ 336.5**	**$ 337.0**	**$ 339.8**	**$ 341.6**	**$ 343.7**
Total Operating Cost per lb U3O8	**$ 16.74**	**$ 17.26**	**$ 17.52**	**$ 17.37**	**$ 17.64**	**$ 17.20**	**$ 15.01**	**$ 15.37**	**$ 15.28**	**$ 15.28**	**$ 15.91**	**$ 15.99**	**$ 16.09**

Operating Costs ($Cdn M)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
McArthur River Mining											
Site Administration	$ 54.5	$ 54.5	$ 54.5	$ 54.5	$ 53.7	$ 52.8	$ 52.8	$ 52.8	$ 52.5	$ 52.4	$ 1,223.6
Mining Costs	122.9	123.6	120.9	118.3	103.2	97.7	97.0	97.0	88.5	89.6	2,218.4
Process	18.3	18.3	18.2	18.2	17.8	17.6	17.6	17.6	17.5	17.1	406.2
Corporate Overhead	12.1	11.5	11.4	11.1	10.0	9.9	9.6	9.5	9.1	9.0	284.9
Total Mining Costs	207.8	207.9	205.0	202.1	184.7	178.0	177.0	176.9	167.6	168.1	4,133.1
Key Lake Milling											
Administration	58.9	58.9	58.9	56.6	56.6	56.6	56.6	56.6	56.6	58.8	1,348.0
Milling Costs	92.9	92.6	90.6	90.2	79.6	79.7	79.4	79.5	74.9	75.0	2,005.4
Corporate Overhead	8.6	8.5	8.5	8.6	8.3	8.2	8.2	8.2	8.1	8.1	203.3
Total Milling Costs	160.4	160.0	158.0	155.4	144.5	144.5	144.2	144.3	139.6	141.9	3,556.7
Total Operating Costs	**$ 368.2**	**$ 367.9**	**$ 363.0**	**$ 357.5**	**$ 329.2**	**$ 322.5**	**$ 321.2**	**$ 321.2**	**$ 307.2**	**$ 310.0**	**$ 7,689.8**
Total Operating Cost per lb U3O8	**$ 17.25**	**$ 17.47**	**$ 18.75**	**$ 18.74**	**$ 31.90**	**$ 31.23**	**$ 31.68**	**$ 31.65**	**$ 48.29**	**$ 47.97**	**$ 19.23**

**** presented as total cost to the McArthur River Joint Venture**

22 ECONOMIC ANALYSIS

22.1 Economic Analysis

The following economic analysis, as shown in Table 22-1 for the McArthur River Operation, is based on the current mine plan which contemplates the mining and milling of all of the current estimated Mineral Reserves. The analysis does not contain any estimate involving the potential mining and milling of Mineral Resources. Expenditures required to bring any of the Mineral Resources into production have not been included. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

The analysis provided is from the point of view of Cameco, which owns 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 and resource surcharges that will be payable on the sale of concentrates.

The analysis estimates a pre-tax NPV (at a discount rate of 8%) to Cameco, as at August 31, 2012, of $3.0 billion for its share of the McArthur River estimated Mineral Reserves. Using the initial investment and operating cash flows from inception, the pre-tax IRR has been estimated to be 11.9%.

The economic analysis presented in Table 22-1 is shown as of January 1, 2012, but the pre-tax NPV and IRR are estimated as at August 31, 2012.

Table 22-1: McArthur River Mine Economic Analysis – Cameco's Share

Economic Analysis ($Cdn M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Production volume (000's lbs U3O8)	13,472	13,193	13,066	13,054	13,059	13,062	15,391	15,364	15,374	15,395	14,904	14,911	14,914
Sales revenue	$ 643.7	$ 700.5	$ 724.9	$ 734.4	$ 764.1	$ 764.6	$ 923.0	$ 929.6	$ 934.1	$ 966.9	$ 938.3	$ 932.9	$ 954.2
Operating costs	225.5	227.7	228.9	226.8	230.4	224.8	231.0	236.2	235.0	235.3	237.2	238.4	240.0
Capital costs	189.3	235.0	285.8	236.8	214.2	151.8	168.7	134.2	107.5	109.7	89.6	67.8	65.9
Basic royalty	25.7	28.0	29.0	29.4	30.6	30.6	36.9	37.2	37.4	38.7	37.5	37.3	38.2
Resource surcharge	19.3	21.0	21.7	22.0	22.9	22.9	27.7	27.9	28.0	29.0	28.1	28.0	28.6
Tiered royalty	41.2	50.9	55.1	56.5	61.0	61.0	75.2	76.3	77.0	81.8	79.5	78.7	81.9
Net pre-tax cash flow	$ 142.7	$ 137.9	$ 104.4	$ 162.9	$ 205.0	$ 273.5	$ 383.5	$ 417.8	$ 449.2	$ 472.4	$ 466.4	$ 482.7	$ 499.6

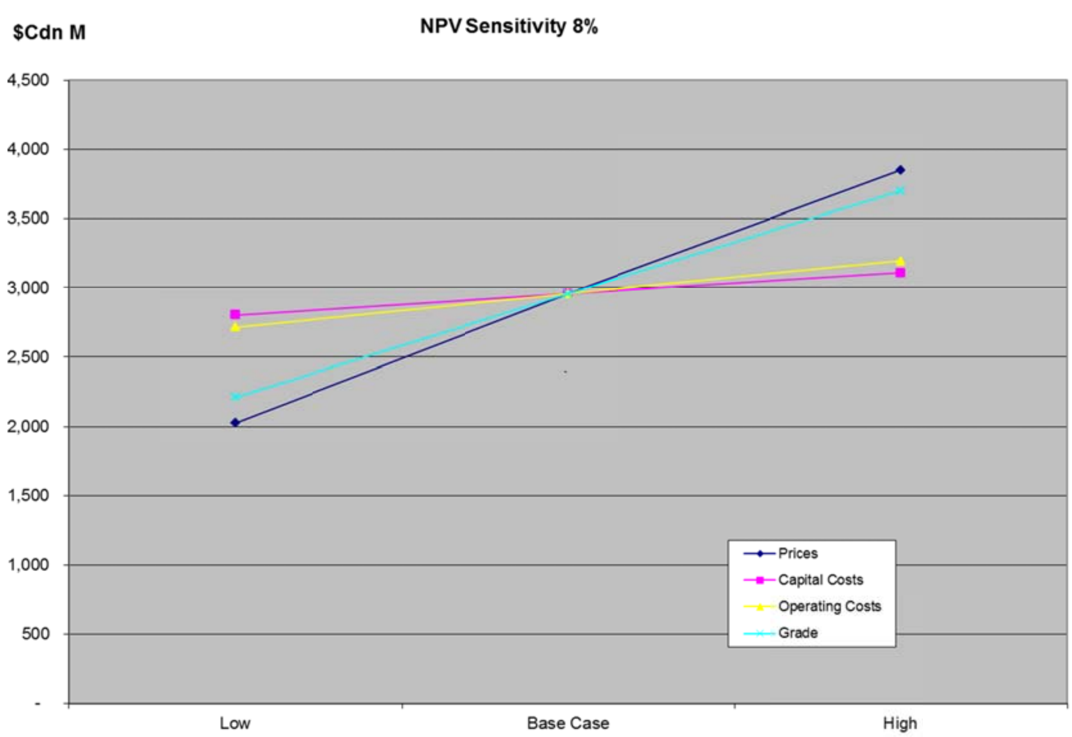
Economic Analysis ($Cdn M)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
Production volume (000's lbs U3O8)	14,899	14,697	13,517	13,316	7,205	7,209	7,077	7,084	4,441	4,511	279,115
Sales revenue	$ 956.8	$ 943.3	$ 867.5	$ 850.1	$ 458.3	$ 458.5	$ 450.1	$ 450.6	$ 282.4	$ 286.9	$16,915.7
Operating costs	257.1	256.8	253.3	249.7	229.9	225.1	224.3	224.2	214.5	216.4	5,368.5
Capital costs	67.5	52.2	58.2	55.0	40.2	40.8	36.2	28.5	17.6	11.9	2,464.4
Basic royalty	38.3	37.7	34.7	34.0	18.3	18.3	18.0	18.0	11.3	11.5	676.6
Resource surcharge	28.7	28.3	26.0	25.5	13.7	13.8	13.5	13.5	8.5	8.6	507.2
Tiered royalty	82.3	81.1	74.6	72.8	39.2	39.2	38.5	38.5	24.1	24.5	1,390.9
Net pre-tax cash flow	$ 482.9	$ 487.2	$ 420.7	$ 413.1	$ 117.0	$ 121.3	$ 119.6	$ 127.9	$ 6.4	$ 14.0	$ 6,508.1

Pre-tax NPV (8%) to August 31, 2012	$ 2,955.6
Pre-tax IRR (%)	11.9%

22.2 Sensitivities

The graph in Figure 22-1 illustrates the project's sensitivity to changes in uranium grade, capital cost, operating cost, and uranium prices (including the mitigating effects of Cameco's level of committed sales through its sales contract portfolio). The graph illustrates the variability around the base case pre-tax net present value of $3.0 billion, using sensitivities of plus and minus 10% on all variables, except uranium price. For uranium price, the high and low cases represent a plus or minus $10 deviation from the average spot price projections incorporated in the base case realized prices as shown in Table 19-2.

Figure 22-1: McArthur River Mine Sensitivity Analysis



The McArthur River mine shows relatively low sensitivity to changes in operating or capital cost projections. The relative sensitivity to changes in price and ore grade is significantly higher due in part to the relatively high grade nature of the deposit, and the price estimates being used.

The significant difference between the average realized price of $60.92/lb U_3O_8 and the average operating cost of $19.23/lb U_3O_8 makes the mine economics less sensitive to changes in the average operating cost.

22.3 Payback

Payback for Cameco, including all actual costs was achieved in 2010, on an undiscounted, pre-tax basis. All future capital expenditures are forecasted to be covered by operating cash flow.

22.4 Mine Life

The McArthur River mine has current Mineral Reserves that forecast production of 387 Mlbs U_3O_8 (mill recovered) from August 31, 2012. The production schedule for McArthur River is assumed to be equal to the current average licence limit of 18.7 Mlbs U_3O_8 per year until 2017. A planned production increase to 22.0 Mlbs U_3O_8 per year is scheduled in 2018, subject to receipt of regulatory approval. Between 2018 and 2026, an average annual production of 21.5 Mlbs U_3O_8 is forecast. Estimated production then begins to decrease in three distinct steps toward the end of the mine life in 2034. Based on the planned production schedule, Cameco estimates that McArthur River will have a mine life of at least 22 years (See Section 16.5).

22.5 Taxes

The McArthur River Operation operates as an unincorporated joint venture and is therefore not subject to direct income taxation at the joint venture level. Cameco operates the mine on behalf of the MRJV and distributes the resulting U_3O_8 production to the MRJV partners in proportion to their joint venture interests.

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

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

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

22.6 Royalties

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

The tiered royalty is an additional levy on the gross sales of uranium, which applies only when the sales price of uranium exceeds levels prescribed by the Schedule. Uranium sales subject to the tiered royalty are first reduced by capital allowances, as permitted by the Schedule, for new mine or mill construction and certain mill expansions. Additions of capital allowances for new mines and mills are determined using amounts prescribed by the Schedule based on the design capacity of the new facility, and not on the actual construction costs. The aggregate of the allowances, less any allowance deductions, determines the balance in the capital recovery bank (CRB). When the allowable annual deduction from the CRB is fully maximized or the CRB is reduced to zero, tiered royalties become payable. Both the sales prices at which the tiered royalties become payable and the CRB, as defined in the Schedule, are adjusted annually to reflect changes in the Canadian gross domestic product. The economic analysis and the tiered royalties described herein do not take into account the possible CRB that may become available from an increase in licensed capacity at Key Lake. If additional CRB were to become available, this would reduce the amount of the tiered royalties payable.

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

	Tiered Royalty rate	**Canadian dollar (\$/lb U_3O_8) Sales price in excess of:**
	6%	\$18.66
Plus	4%	\$28.00
Plus	5%	\$37.33

The above sales prices are applicable to 2012 and are in Canadian dollars. For example, if the sales price realized by Cameco was $50 per pound in Canadian dollars, the tiered royalty payable would be calculated as follows (assuming all capital allowances have been reduced to zero):

[6% x ($50.00 – $18.66) x pounds sold] + [4% x ($50.00 –$28.00) x pounds sold] + [5% x ($50.00 - $37.33) x pounds sold]

= $3.39 per pound sold (about 6.8% of the assumed $50 contract price

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

Table 22-2: Expected Royalties and Annual Resource Surcharge to be Incurred by Cameco for McArthur River Operation

Royalties & Resource Surcharge ($Cdn M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Basic royalty	$ 25.7	$ 28.0	$ 29.0	$ 29.4	$ 30.6	$ 30.6	$ 36.9	$ 37.2	$ 37.4	$ 38.7	$ 37.5	$ 37.3	$ 38.2
Resource surcharge	19.3	21.0	21.7	22.0	22.9	22.9	27.7	27.9	28.0	29.0	28.1	28.0	28.6
Tiered royalty	41.2	50.9	55.1	56.5	61.0	61.0	75.2	76.3	77.0	81.8	79.5	78.7	81.9
Total Royalties & Resource Surcharge	**$ 86.2**	**$ 99.9**	**$ 105.8**	**$ 107.9**	**$ 114.5**	**$ 114.5**	**$ 139.8**	**$ 141.4**	**$ 142.4**	**$ 149.5**	**$ 145.1**	**$ 144.0**	**$ 148.7**

Royalties & Resource Surcharge ($Cdn M)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
Basic royalty	$ 38.3	$ 37.7	$ 34.7	$ 34.0	$ 18.3	$ 18.3	$ 18.0	$ 18.0	$ 11.3	$ 11.5	$ 676.6
Resource surcharge	28.7	28.3	26.0	25.5	13.7	13.8	13.5	13.5	8.5	8.6	507.2
Tiered royalty	82.3	81.1	74.6	72.8	39.2	39.2	38.5	38.5	24.1	24.5	1,390.9
Total Royalties & Resource Surcharge	**$ 149.3**	**$ 147.1**	**$ 135.3**	**$ 132.3**	**$ 71.2**	**$ 71.3**	**$ 70.0**	**$ 70.0**	**$ 43.9**	**$ 44.6**	**$ 2,574.7**

23 ADJACENT PROPERTIES

The mineralization in the area of Zone 4 South extends southwestward into the neighbouring Read Lake property, which is adjacent to the Mineral Lease. The Read Lake property is owned by the Read Lake Joint Venture. The Read Lake Joint Venture partners are Cameco (78.241%) and AREVA (21.759%). Refer to Figure 10-1 for the location of the boundary between the Mineral Lease and the Read Lake property. No Mineral Resources from the Read Lake property are included into the McArthur River Mineral Resources.

24 OTHER RELEVANT DATA AND INFORMATION

24.1 McArthur River Water Inflows History and Mitigation

There have been two notable water inflow events at the McArthur River mine that have strongly influenced mine design, inflow risk mitigation and inflow preparedness. A brief summary of each inflow event is below.

24.1.1 2003 Water Inflow

On April 6, 2003, during development of the 530 m level of the Panel 5 7320E freeze drift, a ground failure occurred resulting in a mine water inflow. The inflow initially peaked at 825 m^3/h and then slowly dropped over a three day period as the local water table was drawn down and the inflow pathways stabilized. The average steady state inflow after stabilization was 700 m^3/h. Background water inflow to the mine prior to the ground failure was approximately 225 m^3/h.

This inflow event at the time was a “worst case scenario” as the inflow exceeded the available mine dewatering and water treatment capacities. Mining operations ceased immediately and all efforts were directed towards dealing with the event. Water was stored underground at various locations while additional pumping capacity was installed and the water treatment process was modified in order to treat the additional volume of water. During this period, the lower levels of the mine, including the SAG mill chamber, were flooded.

After getting control of the water inflow and taking action to backfill the fall of ground area, focus was placed on rehabilitating the mine and investigating the cause of the incident. On June 30, 2003, mining activities resumed at McArthur River. Mine production ceased for approximately three months. The water inflow was officially sealed in July 2004, 15 months after the initial inflow event. Following this event, significant changes were made on how the site manages inflow risks which included expanding the site dewatering and water treatment capacities.

24.1.2 2008 Water Inflow

On November 4, 2008, a water inflow event occurred on the 590 m level of the 7820N freeze drift. The initial peak inflow was in the range of 120-140 m^3/h followed by a steady state inflow of approximately 85 m^3/h within 48-60 hours. The area being developed was classified as low risk and the volume of the inflow supported the site’s risk analysis of the area.

This inflow was quickly managed through the site contingency plans and had no impact on mine production. The inflow area was secured by means of pouring a concrete bulkhead and pressure grouting the area. Local development in the area of the inflow was delayed approximately one year.

After investigation and review of the inflow event, the conclusion was that no additional controls were necessary, but some of the existing controls and practices were strengthened in order to lower the probability of a similar event occurring.

24.1.3 Inflow Mitigation and Preparedness

The lessons learned from these two inflow events are incorporated into the sites designs and procedures around inflow risk mitigation and inflow preparedness as described below.

Inflow Risk Mitigation: Inflow risks are mitigated through design and methods. Common examples are the following:

- avoidance of development in high risk areas whenever possible and practical;
- establishment of inflow barriers such as freeze walls and grout curtains;
- conservative ground support designs to reduce the risk of failures;
- minimize the size of openings whenever possible and practical;
- tight filling of mined out areas to minimize ground movement;
- use of excavation methods that minimize ground damage and disturbance (mechanical development in high risk areas, raisebore production mining); and
- the use of third party experts as required when developing in high risk areas.

Inflow Preparedness: Cameco recognizes that it is difficult and costly to fully eliminate the risks of a water inflow. As such a strong focus is put towards inflow preparedness in the following manner:

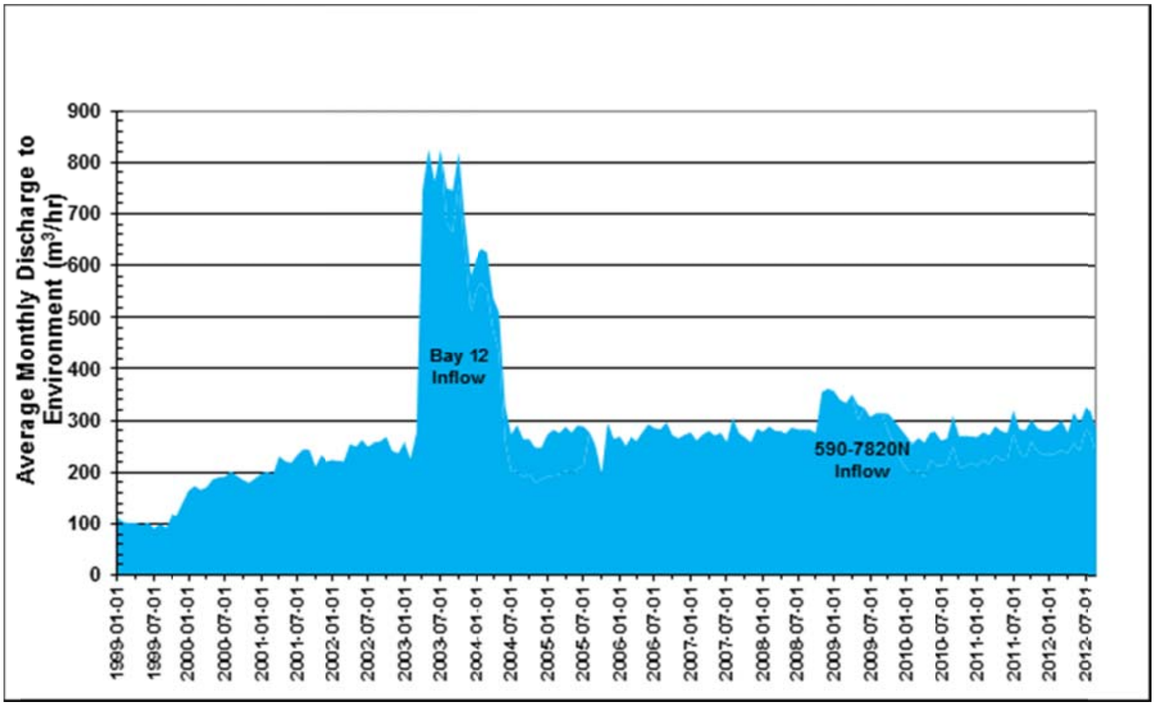
- minimum dewatering capacity standards;
- minimum water treatment capacity standards;
- inflow contingency plans for all high risk inflow areas;
- inflow training and awareness for employees and contractors; and

- inflow materials and supplies are maintained on site to address potential water inflow.

Cameco's standard is to secure pumping capacity of at least one and a half times the estimated maximum sustained inflow. Cameco believes it has sufficient pumping, water treatment and surface storage capacity to handle the estimated maximum sustained inflow.

Figure 24-1 shows the historical water discharge since January 1999.

Figure 24-1: Historical Water Discharge to the Environment



24.2 Deilmann Tailings Management Facility

Following completion of mining in the eastern portion of the Deilmann pit in 1995, the pit was converted to a tailings management facility. The Deilmann TMF was commissioned in January 1996 and has been used continuously since. The system was initially operated in a subaerial tailings deposition mode. It was converted from subaerial tailings disposal system to a subaqueous tailings disposal system in 1998 following approval by the CNSC and Saskatchewan Resource Management, meaning that the water level in the pit was allowed to rise above the tailings surface. The sand envelope was designed to allow excess water to drain to a drainage blanket underlying the tailings at the bottom of the pit and then to dewatering pumps in a raise well connected by a drift to the drainage blanket. The remaining Key Lake tailings were deposited subaqueously followed by the deposition of tailings from McArthur River ore in 2000 to present. Subsequently, all tailings have been deposited beneath the water cover. Flooding of the pit was accomplished by reducing the pumping rate from peripheral dewatering wells that had been used to dewater the pit during mining and construction. During this planned flooding of the Deilmann TMF, Cameco followed a "hydraulic balancing approach" of controlling the water table elevations behind the slopes below the pit water elevation via pumping from the dewatering system around the Deilmann TMF to prevent or minimize pit wall failures. Minor amounts of sloughing were expected from the outwash sand slopes in the west cell and northwest portion of the east cell due to re-saturation of sand during the flooding of the Deilmann TMF and ensuing wave erosion of the slopes.

The design water elevation of the Deilmann TMF for the subaqueous deposition was initially set at 510 masl. Beginning in July 2001, when the rising water contacted the lowermost sections of the outwash sand in the Key Lake trough, periodic sloughing of the pit walls in the western portion of the Deilmann TMF was experienced. Subsequent significant sloughing events occurred in the period from July 2001 to May 2005. As a result of these events, Cameco undertook a number of actions to minimize potential damage from future events, including infrastructure relocation along vulnerable sections of the pit crest, installation of slope monitoring stations, and creation of a 30 metre wide “restricted” zone along the perimeter of the pit crest at the west end of the Deilmann TMF.

As of May 2005, about 2.3 million m^3 of sand was estimated to have sloughed in the Deilmann TMF.

Cameco established an advisory committee to address a wide range of technical issues related to the long term operation and performance of the Deilmann TMF. The committee is comprised of third party experts familiar with the Deilmann TMF, Cameco’s technical personnel and site operations personnel. The committee’s mandate is to consider all aspects related to the ongoing operation of the Deilmann TMF, including water management and water balance, dewatering, slope monitoring, water treatment and the sloughing issue so as to ensure the risks to its operation are understood and mitigation recommendations are made on that basis.

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. Studies show that stabilizing and reducing water levels in the pit enhances the stability of the pitwalls, which reduces the risk of pitwall sloughing. Cameco doubled its dewatering treatment capacity and took measures to ensure the long term reliability of the dewatering system (wells, pipelines, and associated infrastructure). This allowed the site to reduce the water level in the pit. Controlling the water level is an effective interim measure in managing the further sloughing while work to cut back the slopes for long term stabilization is completed. There have been no significant sloughing events since water level control was implemented.

In 2009, regulators approved Cameco's plan for the long-term stabilization of the Deilmann TMF pitwalls. Following extensive engineering, design and regulatory review, the Deilmann TMF slope stabilization project was initiated in 2011 with the relocation of surface infrastructure. Currently the project is in the process of cutting back the west wall of the Deilmann TMF to achieve a flatter, more stable, slope for the long term stability of the facility. Cameco expects this project will be complete in 2014.

For further discussion of tailings management, see Section 20.4.1.

24.3 Project Risks

McArthur River is a challenging deposit to mine. These challenges include control of ground water, weak ground formations, radiation protection, water inflow, mine area transitioning, regulatory approvals, tailings capacity and other mine related challenges. Operational experience gained since the start of production has resulted in a significant reduction in risk.

24.3.1 Technical Risks

Water Inflow

A 2003 water inflow resulted in a three-month suspension of production. McArthur River also had a small water inflow in 2008 that did not impact production. See Section 24.1 for a more detailed discussion of water inflows at McArthur River.

Cameco has taken a number of steps to reduce the risk of inflows at McArthur River and increase its inflow preparedness. Notwithstanding these efforts, inflows can occur and the risk of an inflow at McArthur River remains. 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 or a loss of Mineral Reserves. Such consequences could have a material impact upon Cameco.

Transition to New Mining Areas

In order to successfully meet the planned production in the life of mine schedule, Cameco must continue to successfully transition into new mining areas, which includes mine development and investment in critical support infrastructure. These investments are necessary in order to maintain the planned production schedule.

Failure to successfully transition to new mining areas or implement critical mine infrastructure could delay or reduce production, which could have a material and adverse effect on Cameco's earnings, cash flows, financial condition, results of operations and prospects.

The Zone 4 North transition planned in late 2014 carries a slightly higher transition risk than other mining area transitions due to the site's limited flexibility to offset a shortfall in production due to schedule delays.

24.3.2 Regulatory Risks

Tailings Capacity

Tailings from processing McArthur River ore are deposited in the Deilmann TMF. In February 2009, Cameco received regulatory approval to deposit tailings to a moderately higher elevation in the Deilmann TMF. At current production rates, the approved capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018.

In 2008, Cameco 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 additional capacity to allow for other potential sources of production in the region. This tailings option study considered the feasibility of further extending the capacity of the Deilmann TMF and options for new tailings management facilities. The preferred option selected was to increase the licensed storage capacity of the existing Deilmann TMF. Cameco is proceeding with the EA to support an application for regulatory approval to deposit tailings in the Deilmann TMF to a much higher level, which will provide adequate tailings storage for all of the known McArthur River Mineral Reserves. The EA for the Deilmann TMF and tailings management are discussed further in Sections 20.3 and 20.4.1, respectively.

A significant delay in obtaining or a failure to receive, the necessary regulatory approval for the Deilmann TMF expansion could interrupt or prevent the operation of the McArthur River and Key Lake Operations as planned.

Production Rate Increase

As discussed in Section 16.5 and Section 20.3, the McArthur River production schedule includes a production rate increase to 22.0 Mlbs U_3O_8 per year in 2018, subject to receipt of regulatory approval. In 2012, Cameco was notified by the CNSC that the EA for the proposed increase in production at McArthur River to 22 Mlbs U_3O_8 per year would be transitioned to the CNSC licensing and compliance processes under the authority of the NSCA rather than the federal EA process.

A corresponding increase to mill production at Key Lake will also be necessary. As described in Section 20.3, Cameco has initiated an EA at Key Lake which, among other matters, includes a proposed increase in its nominal annual production rate to 25 Mlbs U_3O_8.

A significant delay in obtaining or a failure to receive, the necessary regulatory approval for the increase in planned production at McArthur River to 22 Mlbs U_3O_8 per year or the corresponding increase to Key Lake of its production rate, could prevent the operation of the McArthur River and Key Lake Operations as planned.

If a delay in obtaining or a failure to receive, a regulatory approval results in an interruption or prevention of the planned production schedule at McArthur River and Key Lake Operations, this could have a material and adverse effect on Cameco's earnings, cash flows, financial condition, results of operations and prospects.

24.4 Caution about Forward-Looking Information

This technical report includes statements and information about expectations for the future that are not historical facts. When we discuss Cameco's strategy, plans and future financial and operating performance, or other things that have not yet taken place, we are making statements considered to be forward-looking information or forward-looking statements under Canadian and US securities laws. We refer to them in this technical report as forward-looking information.

Key things to understand about the forward-looking information in this technical report:

- It typically includes words and phrases about the future, such as *believe, estimate, anticipate, expect, plan, intend, goal, target, forecast, project, scheduled, potential, strategy and proposed* or variations (including negative variations) of such words and phrases or may be identified by statements to the effect that certain actions, events or results, *may, could, should, would, will be or shall be taken, occur or be achieved*.

- It is based on a number of material assumptions, including those we have listed below, which may prove to be incorrect.

- Actual results and events may be significantly different from what is currently expected, because of the risks associated with the project and Cameco's business. We list a number of these material risks below. We recommend you also review other parts of this document, including Section 24.3 which outlines a number of key project risks, Cameco's Annual Information Form for the year ended December 31, 2011 under the headings "Caution about forward-looking information" and "Risks that can affect our business" and Cameco's annual management's discussion and analysis for the year ended 2011 under the headings "Caution about forward-looking information" and "Uranium Operating Properties – McArthur River/Key Lake -

Managing our risks", which include a discussion of other material risks that could cause actual results to differ from current expectations.

Forward-looking information is designed to help you understand current views of the qualified persons and management of Cameco. It may not be appropriate for other purposes. Cameco and the qualified persons will not necessarily update this forward-looking information unless required to by securities laws.

Examples of forward-looking information in this Technical Report

- Cameco's plans and expectations for the McArthur River and Key Lake Operations;
- results of the economic analysis, including but not limited to forecasts of uranium price, net present value, internal rate of return, cash flows and sensitivity analysis;
- estimates of capital, operating, sustaining and mine reclamation and closure costs;
- mineral resource and mineral reserve estimates;
- forecasts relating to mining, development and other activities including but not limited to mine life and mine and mill production;
- Cameco's expectation that all necessary regulatory permits and approvals will be obtained to meet its future annual production targets;
- Cameco's belief that the raisebore, boxhole and blasthole stope mining methods will be successful and that it will be able to solve technical challenges as they arise;
- future royalty and tax payments and rates; and
- timing for completion of capital projects.

Material assumptions

- there is no material delay or disruption in Cameco's plans as a result of ground movements, cave ins, additional water inflows, natural phenomena, delay in acquiring critical equipment, equipment failure or other causes;
- there are no labour disputes or shortages;
- all necessary contractors, equipment, operating parts, supplies, regulatory permits and approvals are obtained when they are needed;
- Key Lake mill functions as designed and sufficient tailings capacity is available;

- Cameco's mineral resource and mineral reserve estimates and the assumptions they are based on are reliable (See Sections 14.2 and 15.2);
- McArthur River development, mining and production plans succeed, including infrastructure expansion and transitioning to new mining areas; and
- Cameco's expectation that the raisebore, boxhole and blasthole stope mining methods will be successful and that it will be able to solve technical challenges as they arise; and

Material risks

- an unexpected geological, hydrological, underground condition or an additional water inflow;
- ground movements and cave ins;
- the necessary regulatory permits or approvals cannot be obtained or maintained;
- natural phenomena, labour disputes, equipment failure, delay in obtaining the required contractors, equipment, operating parts and supplies or other reasons cause a material delay or disruption in Cameco's plans;
- Key Lake mill does not function as designed and sufficient tailings facility capacity is not available;
- mineral resource and mineral reserve estimates are not reliable; and
- Cameco's development, mining or production plans are delayed or do not succeed for any reason.

25 INTERPRETATION AND CONCLUSIONS

McArthur River is a mature operation that has successfully extracted over 225 Mlbs of U_3O_8 since its start of production in 1999. As of August 31, 2012, Cameco's share of the Mineral Reserves is estimated to be 269.1 Mlbs U_3O_8, an increase of 19.0% since December 31, 2011, due to a 22.1% increase in tonnage and only a slight decrease in the average grade.

The McArthur River mine represents a significant economic source of feed material for the Key Lake mill. With an estimated mine life of 22 years, McArthur River is forecast to produce a further 387 Mlbs U_3O_8 (mill recovered) as of August 31, 2012. At the forecast average realized uranium price over this 22 year period, it is estimated that Cameco will receive substantial positive net cash flows from its share of McArthur River production.

The economic analysis results in an estimated pre-tax NPV (at a discount rate of 8%) to Cameco, as of August 31, 2012, of $3.0 billion for its share of the McArthur River Mineral Reserves. Using the initial investment and operating cash flows from inception, the pre-tax IRR is estimated to be 11.9%.

Operating costs for the MRJV are estimated to average $19.23/lb U_3O_8 over the mine life. This a slight decrease since 2009, but it is considered to be significant given the general trend of escalating costs widespread across the mining industry, particularly in the areas of labour, energy and consumables. For the period from 2012 to 2016, operating costs are estimated to average $17.31/lb U_3O_8.

Cameco's share of the total estimated life of mine capital costs for the McArthur River and Key Lake Operations is $2.5 billion compared to $1.4 billion in the 2009 Technical Report. More than 40% of this increase is related to the addition of more than 85 Mlbs U_3O_8 of new forecast production since the 2009 Technical Report and about 15% relates to expenditures required to allow production at a higher rate such as additional ventilation including the sinking of a fourth ventilation shaft. The remainder of the increase is related to expanding the infrastructure to support ongoing and expanded operations and general cost escalation.

In connection with changes to the production schedule, a number of critical mine infrastructure investments are planned. Capital cost estimates include an additional capital investment of approximately $285 million in connection with underground development associated with newly added Mineral Reserves and an additional capital investment of approximately $350 million for freeze installation and distribution costs and dewatering equipment planned for new mining areas.

Additional ventilation costs of approximately $220 million have been included in order to support the entire mine throughout the mine life. Additional ventilation volume will be required by the end of 2017 in order to meet production needs.

A sensitivity analysis of the McArthur River economics demonstrates that the McArthur River mine shows relatively low sensitivity to changes in operating or capital cost projections. The relative sensitivity to changes in price and ore grade is significantly higher due in part to the relatively high grade nature of the deposit and the price estimates being used. The significant difference between the average realized price of \$60.92/lb U_3O_8 and the average operating cost of \$19.23/lb U_3O_8 makes the mine economics less sensitive to changes in the average operating cost.

The McArthur River production schedule has been modified to incorporate the additional Mineral Reserves and to incorporate a production rate increase to 22.0 Mlbs U_3O_8 per year that is scheduled for 2018, subject to receipt of regulatory approval. The updated production schedule assumes the current average licence limit of 18.7 Mlbs U_3O_8 per year until 2017. Between 2018 and 2026, an average annual production of 21.5 Mlbs U_3O_8 is forecast. Estimated production then begins to decrease in three distinct steps towards the end of the mine life in 2034. Mill production at Key Lake will closely follow mine production for the life of mine. Differences in a given production year between mine and mill production will occur due to the addition of mineralized material stockpiled at Key Lake, year to year inventory changes and recovery rate (See Section 16.5 and Figure 16-13).

Cameco is continuing to advance its EA for the Key Lake Operation to extend its operation life and establish it as a regional mill, by increasing the tailings capacity of the Deilmann TMF and increasing the nominal annual production rate of Key Lake to 25 Mlbs U_3O_8. In April 2012, Cameco submitted a draft EIS to the regulators and comments were received. Work is underway to provide responses to these comments and submission of the final EIS is planned for 2013.

Cameco continues to advance its strategic Key Lake revitalization plan. A number of the infrastructure upgrades have been completed including upgrading of circuits and the replacement of the acid, steam and oxygen plants. The balance of infrastructure improvements are expected to be complete by 2016. Infrastructure upgrades have largely mitigated prior reliability issues at Key Lake identified in the 2009 Technical Report.

The McArthur River Operation estimated Mineral Reserves have proven, thus far, to be slightly conservative with more lbs of U_3O_8 extracted than predicted. The Mineral Reserve model has been calibrated to more closely predict actual production results. Over the past five years, reconciliation of mine production with the model is within on average 5% of the estimated pounds U_3O_8.

An average uranium price of US\$61 per Lb U_3O_8 was used with a US\$1.00 = Cdn\$1.00 fixed exchange rate to estimate Mineral Reserves. Due to the high grade nature of the McArthur River deposit, the McArthur River Mineral Reserves are robust and not significantly sensitive to variances in uranium price of plus or minus \$20 provided that the annual production remains above 10 million pounds U_3O_8 (approximately 1% variance in Mineral Reserves).

With an average grade of the Measured and Indicated Mineral Resources of 6.35% U_3O_8 and containing 11.8 Mlbs U_3O_8 and Inferred Mineral Resources with an average grade of 7.86% U_3O_8 and containing 56.3 Mlbs U_3O_8, there is good potential to upgrade Mineral Resources. Mineral Resources that are not Mineral Reserves have no demonstrated economic viability.

Brownfield exploration of the site continues with good targets both to the northeast and southwest to be drilled in the coming years. Given the size of the estimated Mineral Reserve and the mining rate, exploration does not need to be accelerated to meet near and mid-term production goals, but delineation drilling is planned to continue in the ordinary course.

With more than 225 Mlbs of U_3O_8 mined from the McArthur River deposit, Cameco has demonstrated that the challenging conditions associated with mining the McArthur Mineral Reserves can be managed. Operational experience gained since the start of commercial production has resulted in a significant reduction in risk.

The greatest technical risk to the McArthur River Operation is production interruption from water inflows. Cameco takes the following steps to reduce the risk of inflows:

- Ground freezing: Before mining, Cameco drills freezeholes and freezes the ground to form an impermeable freezewall around the area being mined. Ground freezing reduces, but does not eliminate the risk of water inflows. To date, Cameco has installed five freeze walls and is currently preparing a sixth. Improvements in drilling equipment and freeze wall design have resulted in the entire Mineral Reserve being amenable to extraction by raisebore mining method.

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

- Pumping capacity and treatment limits: Cameco's standard is to secure pumping capacity of at least one and a half times the estimated maximum sustained inflow. Cameco believes it has sufficient pumping, water treatment and surface storage capacity to handle the estimated maximum sustained inflow. Cameco reviews its dewatering system and requirements at least once a year and before beginning work on any new zone.

As the mine plan is advanced, Cameco plans to make improvements to its dewatering system and to expand its water treatment capacity. (See Sections 18.4.6 and 18.4.7.) The capital cost estimate includes provisions for improvements and expansion.

Ongoing assessment, review and optimization of mine dewatering and treatment capacity requirements are planned to continue as capital plans advance. As well, Cameco plans to continue with current management practices for assessing risk of inflow and inflow prevention in the ordinary course (See Sections 24.1, 24.3.1 and 25).

For a more detailed discussion of the risks associated with McArthur River Operation, see Section 24.3.

26 RECOMMENDATIONS

The recommendations for the McArthur River and Key Lake Operations focus on successful execution of the mine plan, including making investments in critical infrastructure related to electrical, ventilation capacity and freeze installation and distribution, obtaining key regulatory approvals for production increases, increasing licensed tailings capacity at Key Lake and continuing water inflow mitigation and preparedness strategies.

Infrastructure Expansion Investments

In connection with changes to the production schedule, a number of critical mine infrastructure investments are planned. Capital cost estimates include an additional capital investment of approximately $285 million in connection with underground development associated with newly added Mineral Reserves and an additional capital investment of approximately $350 million for freeze installation and distribution costs and dewatering equipment planned for new mining areas.

Additional ventilation costs, including the sinking of a fourth shaft, of approximately $220 million have been included in order to support the entire mine throughout the mine life. Additional ventilation volume will be required by the end of 2017 in order to meet production needs.

Some of the capital projects related to the mine's infrastructure expansion have not been evaluated beyond the detailed feasibility level. Project optimization, including completion of value engineering studies, is planned to continue as capital plans are advanced and implemented.

In order to execute the mine plan, the proposed operating and capital expenditures set out in Table 21-1 and Table 21-2 of Section 21 of this report are necessary and endorsed by the authors of this technical report.

Regulatory Approvals

Although the mine plan does not currently include a production increase beyond the licensed production capacity of the McArthur River and Key Lake Operations until 2018, it is recommended that Cameco continue to prioritize in the near term securing the requisite approvals to implement the planned production schedule.

Cameco is continuing with its plan to secure regulatory approval from the CNSC for its planned McArthur River production rate increase to 22.0 Mlbs U_3O_8 by 2018. Cameco has initiated a separate EA for the Key Lake mill to extend its operational life and establish it as a regional mill by increasing the tailings capacity of the Deilmann TMF and increasing the nominal annual production rate of Key Lake to 25 Mlbs U_3O_8. Cameco may wish to consider the merits of a corresponding annual production rate increase at McArthur River to 25 Mlbs U_3O_8.

At current production rates, the approved licensed capacity of the Deilmann TMF is sufficient to hold tailings from the McArthur River Operation until 2018. The Key Lake EA is required to support an application for regulatory approval to increase the tailings capacity of the Deilmann TMF by raising the tailings elevation. As the mine plan includes production beyond the current approved licensed capacity, it is recommended that Cameco continue to prioritize the Key Lake EA and track progress until regulatory approval for increased tailings capacity of the Deilmann TMF is received.

Water Inflow

Recognizing that water inflow is considered by Cameco to be the greatest technical risk to the McArthur River Operation, Cameco has established a number of risk inflow mitigation measures and inflow preparedness standards and practices (See Section 24.1). As the mine plan is advanced, Cameco plans to make improvements to its dewatering system and to expand its water treatment capacity. (See Sections 18.4.6 and 18.4.7.) The capital cost estimate includes provisions for improvements and expansion.

Ongoing assessment, review and optimization of mine dewatering and treatment capacity requirements are planned to continue as capital plans advance. As well, Cameco plans to continue with current management practices for assessing risk of inflow and inflow prevention in the ordinary course (See Sections 24.1, 24.3.1 and 25).

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

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28 DATE AND SIGNATURE PAGE

This technical report titled "McArthur River Operation, Northern Saskatchewan, Canada", dated November 2, 2012 with an effective date of August 31, 2012 has been prepared by, or under the supervision of, the undersigned qualified persons within the meaning of NI 43-101.

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