DOMINION DIAMOND CORPORATION

September 15, 2016

VIA SEDAR

British Columbia Securities Commission

Alberta Securities Commission

Financial and Consumer Affairs Authority of Saskatchewan

The Manitoba Securities Commission

Ontario Securities Commission

Autorité des marchés financiers

Financial and Consumer Services Commission (New Brunswick)

Nova Scotia Securities Commission

Office of the Superintendent of Securities Service (Newfoundland and Labrador)

Office of the Superintendent of Securities (Prince Edward Island)

Office of the Superintendent of Securities, Department of Justice, Government of the Northwest Territories

Nunavut Securities Office, Department of Justice, Government of Nunavut

Office of the Yukon Superintendent of Securities, Community Services, Government of Yukon

Dear Sirs/Mesdames:

Re: Voluntary Filing of Technical Report – Dominion Diamond Corporation (the "Corporation")

The enclosed technical report (the "**Report**") entitled "Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report", which has an effective date of July 31, 2016, is being filed by the Corporation on a voluntary basis as contemplated under section 4.2(12) of the Companion Policy to National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("**NI 43-101**"). The Report is being filed by the Corporation in order to provide updated scientific and technical information in respect of the Ekati Diamond Mine and not as a result of a requirement under NI 43-101.

Yours sincerely,

(Signed)

Chantal Lavoie, P.Eng
Chief Operating Officer
Dominion Diamond Corporation

Dated 15, September, 2016.

EKATI DIAMOND MINE NORTHWEST TERRITORIES, CANADA

NI 43-101 TECHNICAL REPORT

PREPARED ON BEHALF OF:

DOMINION DIAMOND CORPORATION
1102-4920 52ND STREET
YELLOWKNIFE, NT X1A 3T1

PREPARED BY:

J.A. CARLSON, P. GEO.
P.J. RAVENSCROFT, FAusIMM
C. LAVOIE, P. ENG.
J. CUNNING, P. ENG.

REPORT EFFECTIVE DATE:

31 JULY 2016

DOMINION DIAMOND CORPORATION

DOMINION DIAMOND CORPORATION

CERTIFICATE OF QUALIFIED PERSON

I, Jon Carlson, P.Geo., am employed as the Manager of Strategic Planning for the Ekati Operation with Dominion Diamond Corporation, whose office is situated at 1102-4920 52nd Street, Yellowknife, NT X1A 3T1.

This certificate applies to the technical report entitled "Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report" that has an effective date of 31 July 2016 (the "technical report").

I am a Professional Geologist member of the Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories (#L833). I graduated from West Virginia University with a Bachelor's Degree in Geology in 1979; and from the Colorado State University with a Masters Degree in Economic Geology in 1983.

I have practiced my profession for 32 years. I have been directly involved in diamond exploration and project development and have been continuously engaged with the discovery, exploration, evaluation and development of the Ekati Diamond Mine in the Northwest Territories, Canada since 1992.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101- *Standards of Disclosure for Mineral Projects* (NI 43–101).

I have worked in the Ekati project area for 24 years, the last 10 years of which I have had direct involvement with mine site operations.

I am responsible for Sections 1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10, 1.25, 1.26; Section 2; Section 3; Section 4; Section 5; Section 6; Section 7; Section 8; Section 9; Section 10; Section 11; Section 12; Section 23; Sections 25.1, 25.4, 25.5, 25.6, 25.7, 25.8, 25.18, 25.19; Section 26; Section 27 and Appendix A of the technical report.

I am not independent of Dominion Diamond Corporation as independence is described by Section 1.5 of NI 43–101.

I have previously co-authored the following technical reports on the Ekati Operation as follows:

Heimersson, M., and Carlson, J., 2013: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 10 April 2013.

Carlson, J., Ravenscroft, P., Lavoie, C., and Cunning, J., 2015: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 31 January, 2015.

I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

Dated: 15 September, 2016

"Signed and sealed"

Jon Carlson, P.Geo.

CERTIFICATE OF QUALIFIED PERSON

I, Peter John Ravenscroft, FAusIMM, am the owner of Burgundy Mining Advisors Limited, whose office address is Marron House, Virginia & Augusta Streets, P.O. Box N-8326, Nassau, Bahamas.

This certificate applies to the technical report entitled “Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report” that has an effective date of 31 July 2016 (the “technical report”).

I am a Fellow of the Australasian Institute of Mining and Metallurgy (membership number 205218). I graduated from the University of Cape Town in 1979 with a Bachelor of Science degree in Mathematical Statistics, and from the Ecole des Mines de Paris in 1985 with the equivalent of a Masters degree in Geostatistics.

I have practiced my profession for 37 years. I have been directly involved in resource and reserve estimation, mine planning and project evaluation for a wide range of commodities, including over ten diamond properties in Africa, Australia and Canada.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 - *Standards of Disclosure for Mineral Projects* (NI 43–101).

I visited the Ekati Operation between January 11–14, 2016, June 25, 2015, March 10–13, 2014, and November 3–6, 2014.

I am responsible for Sections 1.12, 1.13, 1.14, 1.15, 1.16, 1.25; Sections 2.1, 2.2, 2.3, 2.4, 2.5; Section 14; Section 15; Sections 25.10, 25.11, 25.18, and Section 27 of the technical report.

I am independent of Dominion Diamond Corporation as independence is described by Section 1.5 of NI 43–101.

I have been involved with the Ekati Operation since 2013 and have conducted detailed technical work, including reviews of all relevant resource models and supervision of updated resource estimation for the Jay, Sable, Fox and Misery Satellite pipes.

I have previously co-authored a technical report on the Ekati Operation as follows:

Carlson, J., Ravenscroft, P., Lavoie, C., and Cunning, J., 2015: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 31 January, 2015.

I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

Dated: 15 September, 2016

"Signed"

Peter Ravenscroft, FAusIMM

CERTIFICATE OF QUALIFIED PERSON

I, Chantal Lavoie, P.Eng., am employed with Dominion Diamond Corporation as the Chief Operating Officer and President of the Ekati Diamond Mine, whose office is situated at 1102-4920 52nd Street, Yellowknife, NT X1A 3T1.

This certificate applies to the technical report entitled "Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report" that has an effective date of 31 July, 2016 (the "technical report").

I am a Professional Engineer, member of the Professional Engineers of Ontario (#100153256) and the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (#1671). I graduated from Université Laval (Québec) with a Bachelor of Applied Sciences – Mining Engineering in 1986.

I have practiced my profession for 30 years. I have mining experience in both open pit and underground operations, including 11 years specific to the diamond industry where I have been involved in the design, construction, commissioning and operations aspects of diamond mines.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 - *Standards of Disclosure for Mineral Projects* (NI 43–101).

I have worked in the Ekati Operation for four years.

I am responsible for Sections 1.1, 1.4, 1.5, 1.11, 1.17, 1.18, 1.19, 1.20, 1.21, 1.22, 1.23, 1.24, 1.25, 1.26; Section 2; Section 3; Section 13; Sections 16.1, 16.2, 16.3, 16.4.1, 16.4.2, 16.4.3, 16.4.4, 16.4.5, 16.4.6, 16.4.7, 16.4.8, 16.4.9.4, 16.5, 16.6, 16.7, 16.8, 16.9, Section 17, Section 18.1, 18.2, 18.3.1, 18.3.2, 18.4, 18.5, 18.6, 18.7.1, 18.7.2, 18.7.3, 18.7.5, 18.8, 18.9, 18.10, 18.11, 18.12; Section 19; Section 20; Sections 21.1.1, 21.1.2, 21.1.3, 21.1.4.2, 21.1.5, 21.1.6, 21.1.7, 21.1.8, 21.2, 21.3; Section 22; Section 24; Sections 25.2, 25.3, 25.9, 25.12, 25.13, 25.14, 25.15, 25.16, 25.17, 25.18, 25.19; Section 26; and Section 27 of the technical report.

I am not independent of Dominion Diamond Corporation as independence is described by Section 1.5 of NI 43–101.

I have been involved with the operation for the past three years in my role as Chief Operating Officer of Dominion Diamond Corporation and President of the Ekati Diamond Mine.

I have previously co-authored a technical report on the Ekati Operation:

Carlson, J., Ravenscroft, P., Lavoie, C., and Cunning, J., 2015: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 31 January, 2015.

I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

Dated: 15 September 2016

"Signed and sealed"

Chantal Lavoie, P.Eng.

CERTIFICATE OF QUALIFIED PERSON

I, John Cunning, P.Eng., am employed as a Principal and Geotechnical Engineer with Golder Associates Ltd., with a business address at Suite 200—2920 Virtual Way, Vancouver, BC, V5M 0C4.

This certificate applies to the technical report entitled "Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report" that has an effective date of 31 July 2016 (the "technical report").

I am a member of the Association of Professional Engineers and Geoscientists of the Northwest Territories and Nunavut (Licensee L1870) and the Association of Professional Engineers and Geoscientists of British Columbia (Member 22325). I graduated from the University of Alberta with a Bachelor degree in Civil Engineering in 1991 and a Master's degree in Geotechnical Engineering in 1994.

I have practiced my profession continuously since 1994. My relevant experience includes project management, engineering and construction of mineral projects in the Northwest Territories, Nunavut, and British Columbia, Canada.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 - *Standards of Disclosure for Mineral Projects* (NI 43–101).

I visited the Ekati Operation between January 20 and 23, 2014, and again from August 5 to 6, 2015.

I am responsible for Sections 2.1, 2.2, 2.3, 2.5, 16.4.9.1, 16.4.9.2, 16.4.9.3, 18.3.3, 18.7.4, 21.1.4.1, and Section 27. I am responsible for those portions of the report content relating to the work performed by Golder Associates Ltd. on the Jay project in Sections 1.22.1, 1.26, 16.4.9.4, 21.1.8, 24.2.1, 24.2.2.1, 24.2.2.2, 25.16, and 26.4.

I am independent of Dominion Diamond Corporation as independence is described by Section 1.5 of NI 43–101.

I have been involved with the Ekati Operation since May 2013 during which time I participated in the Jay project pre-feasibility and feasibility studies.

I have previously co-authored a technical report on the Ekati Operation:

Carlson, J., Ravenscroft, P., Lavoie, C., and Cunning, J., 2015: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 31 January 2015.

I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

Dated: 15 September 2016

"Signed and Sealed"
John Cunning, P.Eng

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1.0 SUMMARY

1.1 Introduction

Mr. Jon Carlson, P. Geo., Mr. Peter Ravenscroft, FAusIMM, Mr. Chantal Lavoie, P. Eng., and Mr. John Cunning, P. Eng., (collectively the Qualified Persons, or QPs) on behalf of Dominion Diamond Corporation (Dominion), have prepared a technical report (the Report) on the Ekati Diamond Mine (also referred to as the Ekati Project) in the Northwest Territories, Canada.

On November 13, 2012, Dominion and its wholly-owned subsidiary, Dominion Diamond Holdings Ltd., entered into share purchase agreements with BHP Billiton Canada Inc. (BHP Billiton), and various affiliates to purchase all of BHP Billiton's diamond assets, including its controlling interest in the Ekati Diamond Mine, as well as the associated diamond sorting and sales facilities in Yellowknife, Northwest Territories and Antwerp, Belgium.

Dominion uses a wholly-owned subsidiary, Dominion Diamond Holdings Ltd. as the holding entity for the Ekati Project in the Northwest Territories. The participating entity for the Ekati Project is Dominion Diamond Ekati Corporation, an indirectly wholly-owned subsidiary of Dominion Diamond Holdings Ltd. In this Report, the name Dominion is used interchangeably for the parent and subsidiary companies.

This Report is being filed by the Corporation on a voluntary basis as contemplated under section 4.2(12) of the Companion Policy to National Instrument 43-101 *Standards of Disclosure for Mineral Projects*. The Report is being filed by Dominion to provide updated scientific and technical information in respect of the Ekati Diamond Mine, and not as a result of a requirement under NI 43-101.

The Report uses Canadian English, Canadian dollars, the metric system of units, and an assumption of a 100% ownership basis unless otherwise specified. Two different year descriptors are used. Calendar years (January to December) are used for Project milestone dates. Dominion uses a fiscal year (FY) for financial information and life of mine plans; this year runs from February of one year to January of the following year, such that FY17 runs from February 2016 to January 2017; there is only one month of calendar year 2017 in Dominion's 2017 fiscal year.

1.2 Project Setting

The Ekati Diamond Mine is located near Lac de Gras, approximately 300 km northeast of Yellowknife and 200 km south of the Arctic Circle in the Northwest Territories of Canada.

This area is within the Canadian sub-arctic; cold winter conditions predominate for the majority of the year, with approximately five months of spring/summer/fall weather each year when day-time temperatures are above freezing. Mining activities are conducted year-round.

Road access to the Ekati operation is by a winter ice road that is typically open for 8–10 weeks out of the year, from mid-January to late March. The ice road is built each year as a joint venture between the Ekati Diamond Mine, the Diavik mine, and the Gahcho Kué mine that is under construction. All heavy freight except emergency freight is transported to the site by truck over the ice road. The Ekati Project has an all-season runway and airport facilities suitable to accommodate large airplanes. Air transport is used year round for transport of all personnel to and from the site as well as light or perishable supplies, and as required for emergency freight.

The mine site is within the continuous permafrost zone. The topography across the property is generally flat with local surface relief rising up to 20 m. The terrestrial vegetation community is composed of species adapted to freezing temperatures, low nutrients and localized areas of drought and standing water. The Ekati Project area is predominately wildlife habitat, with limited human use, mainly for hunting.

1.3 Mineral Tenure and Royalties

The Ekati Project was acquired from BHP Billiton Canada Inc. in April 2013. The Project consists of two joint ventures, the Core Zone and the Buffer Zone Joint Ventures. A portion of the tenure originally held under the two joint venture agreements has subsequently been relinquished.

As at the Report effective date:

- The Core Joint Venture is held 88.9% by Dominion and 11.1% by Dr. Stewart Blusson. It encompasses 175 mining leases, totalling about 172,992 ha. Mineral Resource estimates have been performed for the Koala, Misery Main, Misery South, Misery Southwest Extension, Pigeon, Sable, and Fox kimberlites in the Core Joint Venture area. Mineral Resources were converted to Mineral Reserves for the Koala, Misery Main, Pigeon and Sable kimberlites.
- The Buffer Joint Venture is held 65.3% by Dominion and 34.7% by Archon Minerals Ltd (Archon). It contains 106 mining leases covering approximately 89,184 ha. Mineral Resource estimates have been performed for the Jay and Lynx kimberlites within the Buffer Joint Venture area. Mineral Resources were converted to Mineral Reserves for the Jay and Lynx kimberlites.

– In January 2016, the management committee of the Buffer Zone approved a program and budget for the Buffer Zone for fiscal year 2017. In March 2016, Archon provided notice to DDEC, as operator of the Buffer Zone, of its objection to certain elements of the fiscal 2017 program and budget, and indicated that it was only prepared to contribute to certain portions of the program and budget. Dominion has elected to fund all of the cash calls for those elements of the fiscal 2017 program and budget that will not be funded by Archon. Archon has asserted that its objection to the fiscal 2017 program and budget was based on its position that certain proposed expenditures in the fiscal 2017 program and budget were in breach of the terms of the Buffer Zone Joint Venture agreement, and as such, the management committee of the Buffer Zone was not permitted to approve those aspects of the fiscal 2017 program and budget. Accordingly, Archon has disputed Dominion's dilution of Archon's participating interest in the Buffer Zone. A revised program and budget for fiscal year 2017 is expected to be presented to the management committee of the Buffer Zone in the third quarter of fiscal 2017 to incorporate changes to the mine plan impacting the Lynx project in the Buffer Zone. Dilution of Archon's participating interest in the Buffer Zone had been expected in the second quarter of fiscal 2017, but has been temporarily withheld until Archon re-confirms its intentions with respect to funding the revised program and budget.

All mining leases were legally surveyed by licensed surveyors. Annual lease payment requirements have been met as required.

A royalty is payable to the Government of the Northwest Territories (the NWT Royalty). The NWT Royalty payable is either 13% of the value of output of the mine, or an amount calculated based on a sliding scale of royalty rates dependent upon the value of output of the mine, ranging from 5% for value of output between $10,000 and $5 million to 14% for value of output over $45 million.

1.4 Permits and Agreements

Within the Ekati mineral leases, there are 10 surface leases, which provide tenure for operational infrastructure. All mine project developments are within these surface leases.

The Mackenzie Valley Resource Management Act came into effect after issuance of the six original surface leases and before issuance of the Pigeon, Sable and Lynx surface leases. Therefore, land use permits issued by the Wek´èezhìi Land and Water Board were also required for the Pigeon, Sable and Lynx sites.

Dominion has eight Type A land use permits (Sable haul road, Sable open pit and associated activities, Pigeon open pit and associated activities, Misery power line, Lynx open pit and associated activities, Lynx Waste Rock Storage Area, exploration activities, and the Jay Early Works and associated activities). The surface leases for the Misery site and road were amended in 2014 to explicitly allow for the construction and use of a power distribution line from the central Ekati Mine power-generating plant to the Misery site. The surface leases for the Pigeon to Sable Haul Road, Sable Pit, and the Pigeon Pit were renewed in May and July 2016.

Dominion has impact benefit agreements (IBAs) with four groups: Tlicho, Akaitcho, North Slave Metis Alliance and Hamlet of Kugluktuk/Kitikmeot Inuit Association. The IBAs establish requirements for funding, training, preferential hiring, business opportunities, and communications. Although the terms of the IBAs are confidential, the responsible QPs consider the agreements to be similar to other agreements of this type that have been negotiated with Aboriginal groups in Canada. The agreements extend over the current life-of-mine.

1.5 Environment and Social Licence

Dominion operates the Ekati Project under an Environmental Agreement with the Government of Canada and the Government of the Northwest Territories that was concluded in 1997. The agreement is binding over the life-of-mine until full and final reclamation has been completed. The Environmental Agreement provides for an Independent Environmental Monitoring Agency which acts as an independent reviewer representing the public interest.

A number of environmental monitoring programs are in place, and include ongoing assessments of water quality, aquatic effects, fish habitat compensation measures, site reclamation projects, waste rock storage area seepage, wildlife effects, air quality, and geotechnical stability of engineered structures.

Compliance with environmental requirements and agreements is reported publicly on an annual basis through the Water Licence, Environmental Agreement, Fisheries Act Authorizations and other means.

Version 2.4 of the Ekati Mine Interim Closure and Reclamation Plan (ICRP) was approved by the Wek´èezhìi Land and Water Board in November 2011. Various updates to the ICRP have been approved through the Annual Reclamation Progress Report. The Ekati Mine is required under Water Licence W2012L2-0001 and the Environmental Agreement to have a closure plan in place for the Project during active mining operations, and to update that plan on a regular basis and/or when there is a significant change to the Mineral Reserves mine plan. A final closure and reclamation plan will be required two years prior to mine closure.

A total of $298.9 million dollars is currently held for reclamation security of the Ekati Diamond Mine. A total of $11.2 million is required by the Wek'èezhìi Land and Water Board to be posted prior to any future developments at the Sable open pit and prior to commencement of the early works associated with the Jay open pit. An additional $13.9 million has been proposed by Dominion to be required for the remaining development of the Jay open pit.

The current and expected environmental impact of the operation is well identified and subsequent closure and remediation requirements have been sufficiently studied and budgeted for in the opinion of the responsible QPs. Monitoring programs are in place.

Dominion currently holds the appropriate social licenses to operate. A Socio-Economic Agreement was concluded with the Government of the Northwest Territories, and has been in place since 1996. Four IBAs have also been concluded; current relationships with each of the IBA groups are considered positive and are maintained through regular meetings and communications. Dominion currently provides financial support for projects that support the development of long-term sustainable community initiatives. Dominion also tries to incorporate the use of traditional knowledge in monitoring programs by involving communities in the programs and teaching the environmental staff the traditional way of the land.

1.6 Geology and Mineralization

Bedrock at the Ekati Project is dominated by Archean granitoids, intruded by meta-greywackes of the YK Supergroup and transected by Proterozoic mafic dykes. No younger cover sediments are preserved. Bedrock is overlain by Quaternary glacial deposits which are generally less than 5 m thick.

The 45 to 75 Ma kimberlites, part of the Lac de Gras kimberlite field, intrude both the granitoids and metasediments. The kimberlites are mostly small pipe-like bodies (surface area predominantly <3 ha but can reach as much as 20 ha) that typically extend to projected depths of 400–600 m below the current land surface. Kimberlite distribution is controlled by fault zones, fault intersections and dyke swarms.

The kimberlites are made up almost exclusively of volcaniclastic olivine-rich volcaniclastic kimberlite (VK), with lesser mud-rich, resedimented volcaniclastic kimberlite (RVK) and primary volcaniclastic kimberlite (PVK). In rare cases (e.g. Pigeon), pipes are dominated by or include significant proportions of magmatic kimberlite (MK). Economic mineralization is mostly limited to olivine-rich resedimented volcaniclastic and primary volcaniclastic types.

Diamond grades are highly variable. Estimated average grades for kimberlites that have been bulk sampled range from less than 0.05 cpt to more than 4 cpt.

The geological understanding of the settings, lithologies, structural and alteration controls on kimberlite emplacement, and kimberlite continuity and geometry in the different pipes is sufficient to support estimation of Mineral Resources and Mineral Reserves.

Group 1 kimberlites represent the vast majority of worldwide primary diamond deposits that are presently being exploited. The Ekati kimberlites display most of the typical features of Group 1 kimberlite pipes and are therefore considered to be Group 1 type kimberlites. Based on this model, the exploration programs completed to date are appropriate to the mineralization style and setting.

1.7 Exploration

The early stages of diamond exploration consisted of heavy mineral sampling from fluvial and glaciofluvial sediments on a scale of tens of kilometres. Follow-up till sampling of a tighter scale coupled with ground geophysics pinpointed the Point Lake kimberlite pipe which was subsequently confirmed as diamondiferous kimberlite by core drilling. The entire property was then intensively explored using helicopter-borne total field magnetic (TFM), electromagnetic (EM) and very low frequency electromagnetic (VLF) surveys. The targets defined from the airborne geophysics were prioritised for drilling by collecting till samples along lines perpendicular to the dominant flow direction of the last glaciation. The extent and compositional characteristics of kimberlite indicator mineral dispersion trains were evaluated. Ground geophysical surveys including TFM, EM and gravity have enabled more precise target discrimination and estimates of pipe size. Final exploration sweeps of the property were carried out using an improved airborne EM system with tighter line spacing and reduced sensor height and with BHP Billiton’s airborne gravity gradiometer.

Approximately 350 geophysical and/or indicator dispersion targets were drilled, with a total of 150 kimberlites discovered on the Core Zone and Buffer Zone properties. The kimberlites were prioritized using microdiamond and indicator mineral chemistry. Forty kimberlite occurrences were subsequently tested for diamond content using reverse circulation (RC) drilling and/or surface bulk samples. Significant macrodiamond results were obtained on 17 pipes.

There has been no exploration of the Ekati Project area for new kimberlites since 2007. The exploration programs completed to date are appropriate to the styles of the kimberlite pipes within the Project. Significant exploration potential remains in the Project area, with 14 kimberlite pipes identified as potentially warranting additional evaluation.

1.8 Drilling

Drilling completed on the Ekati Project between 1991 and 31 July 2016 includes 1,389 core holes (254,490 m), 111 sonic drill holes (2,596 m) and 513 RC holes (106,547 m).

Core drilling using synthetic diamond-tipped tools and/or carbide bits is used to define the pipe contacts, wall-rock conditions, and internal geology. An initial drill pattern around each pipe is completed, and depending on the results, additional drilling may be required to further delineate potential problem areas. Core drilling is also used to obtain geotechnical and hydrogeological data.

Sonic drilling is used to core both soil and bedrock along proposed civil construction projects such as dike alignments. The primary objective of sonic drilling is to characterize the nature and variation of the soil layers beneath the proposed civil work and to determine the depth to bedrock. Recovered soil is geotechnically logged and geotechnical laboratory testing is performed on selected samples.

Diamonds for grade estimation and valuation are obtained by RC drilling and/or by bulk sampling in underground or open pit bulk sample mines. Samples are processed through an on-site sample plant.

Core and RC logging is performed by trained staff. Digital geological and geotechnical logging is completed and core is photographed before being stored in the attached unheated core storage building. A small sub-sample (approximately 300 cm^3) of RC drill material is taken for every two metres of drilling within kimberlite and a representative portion of this material (approximately 50 to 100 cm^3) is washed and retained; these drill chips are examined and described macroscopically and under binocular microscope.

All core and RC drill hole collars are surveyed with total station global positioning system instruments (GPS) prior to and after drilling. The responsible QPs consider that the drill hole collar location error is minimal.

For core holes, down-hole surveys were done with industry standard instruments (e.g. Maxibor and Century Geophysical Corporation gyroscope). Three Century Geophysical Corporation tools, including the “9095” tool (for gyroscopic deviation surveying); the “9065” three arm calliper; and the “9511” tool (conductivity induction and natural gamma readings), are used on all RC holes.

Samples are taken from core holes for determination of dry bulk density and moisture content of host rock and kimberlite. Sample spacing has historically varied from 1 m to 10 m in kimberlite and every 10 m in host rock. Density determination methods are in line with leading industry practices, and are performed using wax immersion methods.

In the opinion of the responsible QPs, the quantity and quality of the lithological, geotechnical, density, collar and down hole survey data collected in the drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation.

1.9 Sampling

Conventional concepts of sample preparation and analysis do not apply to diamonds. Diamonds from large samples must be physically separated from their host rock and evaluated on a stone by stone basis. To accomplish that, all bulk samples, from RC drilling or underground/surface operations, must be processed and the diamonds separated and collected. To do that, a sample plant is required. Sample plants are essentially scaled-down process plants designed to handle a few tonnes to tens of tonnes per hour.

Bulk sampling and RC sampling provide information on the size frequency distribution and value of the diamonds in a kimberlite pipe. The underground sampling programs yielded large diamond parcels (more than 2,000 ct) for valuation from relatively large individual sample sizes (ca. 40 to 70 t each) at close sample spacing of samples (ca. 3 m). During RC drilling, an initial 100 to 200 t sample is taken from each prioritized kimberlite pipe and, if encouraging results are obtained, more extensive sampling campaigns are undertaken to provide sufficient grade and diamond price data to support classification of resources. The density and spatial distribution of RC drill holes between pipes varies considerably and depends on a number of factors including pipe size, geologic complexity and grade characteristics relative to economic cut-offs.

Sampling methods meet industry-standard practices for diamond operations, and can be used for Mineral Resource and Mineral Reserve estimation and mine planning purposes.

Sampling error has the potential to cause over- or under-estimation of diamond grade. For both RC and drift bulk samples, it is typically not possible to measure fundamental grade sample error (e.g. check assays) as the entire sample is processed. Dominion considers that the precision of the diamond weight estimates is high, because concentrates are double picked by different qualified sorters and audits are undertaken on the double picked concentrates.

The quality of the analytical data is reliable and sample preparation, analysis, and security are generally performed in accordance with diamond exploration best practices and industry standards.

1.10 Quality Assurance, Quality Control, and Data Verification

Data verification is undertaken on geological, geotechnical, survey and bulk density data collected. Data are reviewed for accuracy by the Resource and/or Production Geologists and corrected as necessary. The findings of this data validation process are summarized and any modifications to the database are reviewed by appropriate staff prior to implementation of those changes.

A reasonable level of verification has been completed during the exploration and production phases, and no material issues would have been left unidentified from the verification programs undertaken. Because of the uncertainties inherent in establishing local grade estimates (sample support size), estimation of Measured Mineral Resources is not supported.

1.11 Metallurgical Test Work

Metallurgical test work has been carried out at the Ekati Project site using both the main process plant (production trials) and a similarly configured smaller sampling plant (approximately 10 t/h). Production trials have been completed at various times for the open pit operations (including Fox, Misery and Koala) and during pre-feasibility-level studies for Koala North and Pigeon (test pits). Production trials were recently completed for the Misery SW Extension, Pigeon, and Misery Main pipes.

The sample plant is utilised for grade model validation for the current operations, testing of new kimberlite sources as possible process plant feed (e.g. satellite kimberlite intrusions and reprocessed plant rejects) and periodic recovery audits for the main process plant. The processing circuit comprises crushing, scrubbing, sizing, dense media separation and final diamond recovery using both X-ray sorting and grease table methodologies.

Security protocols are in place at the recovery area of the main process plant and sample plant.

1.12 Mineral Resource Estimates

Mineral Resources are estimated for the Koala, Fox, Misery Main, Misery South and Misery Southwest Extension, Pigeon, Sable, Jay and Lynx kimberlite pipes and for stockpiles.

Resource estimation is a two-step process at Ekati. The first step is to develop three-dimensional object models for key geological domains, analyse spatial sample data in relation to geological domains, and validate their application. The second step is to create a block model storing the spatial distribution of relevant parameters.

In general, kimberlite pipes are roughly ovoid in plan-view, and taper consistently at depth. Vulcan and Leapfrog software are used to develop three-dimensional wireframe models of the kimberlite pipes and internal lithological divisions. Drill hole boundary intersections and surface geophysical outlines are used to define the outer boundary. The lower limits of models are based on the lowest drill hole (RC or diamond) intersection. Internal domain boundaries are typically modelled as planar surfaces. Internal dilution (e.g. granitic xenoliths) is modelled as enclosed volumes assuming sub-rounded, sub-horizontal shapes. The geological models are refined and updated with mining development and production data.

Block models are built for Mineral Resource estimates for kimberlite pipes that are deemed to have reasonable prospects of eventual economic extraction and are periodically updated as new data are collected, or as required to meet reporting requirements and for engineering studies. The block models contain an extensive set of variables to provide a mining block model suitable for both resource evaluation and mine planning. Selective mining unit (SMU) sizes in the block models vary, based on the intended mining method. The SMU size is jointly agreed to by the modelling geologist and mining engineers and is appropriate to the drill hole spacing, mining production scale, and overall geometry of each pipe.

RC sampling programs provide diamond grade and size frequency distribution data for grade estimation. For resource estimates completed since 2014, the base grade estimation variable was the stones per metre cubed (spm^3) from +1.0 mm diamonds. The spm^3 is calculated from a subset of stones over a representative set of size fractions chosen to obviate the effects of poor recovery of small stones and variability in recovery of large stones (i.e. stone density method).

Where feasible, non-mineralized units (i.e. granitic xenoliths >2 m in size) are modelled separately. Waste kimberlite, mud, and xenoliths <2 m in size are considered part of the models, and are therefore included in the Mineral Resource estimate as internal dilution.

The grade variable for the Jay, Sable, and Fox pipes was modeled as spm^3 of a stable size fraction, and then converted on a block-by-block basis to carats per metre cubed (cpm^3) using a factor to map the estimated variable onto the chosen size frequency distribution. In all other pipes grade is estimated directly from sampled cpm^3 values. Dry bulk density in t/m^3 and moisture content in percent were estimated into the block model. Block grade, expressed in carats per tonne (cpt), was calculated by dividing the block cpm^3 grade by the block dry bulk density value.

Drill spacing studies were conducted to support mineral resource classification confidence category assignments. No Measured Mineral Resources have been classified. Drill hole spacing classification is typically as follows:

- Indicated – less than 60 m to nearest sample;
- Inferred – less than 90 m to nearest sample.

In certain deposits, such as Koala, the kriging variance was also used to support classification categories. In models estimated since 2014, the weight attributed to the mean in the simple kriging process was used to support classification.

During estimation of Mineral Resources, a slot screen size cut-off of 0.5 mm and a 100% recovery factor is used. This allows for determination of Mineral Reserves that include additional diamond recovery from the planned fines dense media separation (Fines DMS) plant. Conversion of Mineral Resource block model grades to reflect recovery at a 0.5 mm slot screen size is done by comparative analysis of size frequency distribution data, and adjustment factors determined for each pipe.

The diamond price is estimated for each size cut-off using exploration or production sample parcels, as described in Section 11.11, and stone frequency distributions. The average diamond price (diamond reference price) is estimated for each pipe (and in some cases multiple geological domains within a pipe) using exploration and/or production parcels ranging in size from several hundred carats to tens of thousands of carats. These diamond parcels have been valued on Dominion's Price Book and are adjusted for current market conditions. Dominion has modelled the approximate rough diamond price per carat for each of the Ekati kimberlite types, shown in Table 1-1, using the diamond reference prices from the exploration and production parcels, adjusted to a 0.5 mm slot lower cut-off size, and prices from Dominion's June 2016 rough diamond sale. For the purposes of this Mineral Resource estimate it has been assumed that there is a 2.5% per annum real price growth during the life of the mine excluding the current year in which pricing is assumed to be flat.

Table 1-1: Diamond Reference Price Assumptions for Mineral Resources as at 31 July 2016

Joint Venture Agreement Area	Kimberlite Pipe and Domain	US$/carat at 0.5 mm
Core Zone	Koala Ph5 (RVK)	$243
	Koala Ph6 (VK)	$296
	Koala Ph7 (VK/MK)	$311
	Fox TK	$241
	Misery Main	$64
	Misery Southwest Extension	$37
	Misery South	$49
	Pigeon RVK	$154
	Pigeon MK	$149
	Sable	$128
Buffer Zone	Jay RVK	$56
	Jay VK	$49
	Lynx RVK/VK	$230

Notes to Accompany Diamond Reference Price Table:

1. Diamond reference price is based upon diamonds that would be recovered by the Ekati Bulk Sample Plant using 0.5 mm width slot de-grit screens and retained on a 1.0 mm circular aperture screen.
2. RVK = re-sedimented volcaniclastic kimberlite; VK = volcaniclastic kimberlite; MK = magmatic kimberlite; TK = tuffisitic kimberlite.

Conceptual pit designs for Mineral Resources amenable to open pit mining methods (Misery, Pigeon, Sable, Jay and Lynx) were completed using Whittle shell analysis. Parameters used in pit shell analysis varied by kimberlite, and ranges included:

- Overall pit slope angles vary considerably and were selected to meet the particular design requirements for each pipe, ranging from 35–62º;
- Mining cost assumptions of $5–8/wmt;
- Processing costs of $16–26/dmt;
- General and administrative (G&A) costs of $17–29/dmt.

Conceptual underground designs for Koala were based on a sub-level cave mining method utilising 20 m sub-levels and a $38–63/dmt operating cost range, which was also dependent on elevation. Conceptual underground designs for Fox were based on a 130 m deep block cave mining method and a $50–84/dmt operating cost range.

The classification of stockpiles is based on the resource classification for each source. Active stockpiles are surveyed at the end of July 2016. A number of active run-of-mine

(ROM) stockpiles are included in the end July 2016 stockpile estimates. Stockpiles are from Misery Main, Misery South, Misery Southwest Extension, Koala and Pigeon.

1.13 Mineral Resource Statement

The Mineral Resource statement is reported in accordance with the 2014 CIM Definition Standards. Mineral Resources take into account geological, mining, processing and economic constraints, and have been defined within a conceptual stope design or a conceptual open pit shell. Depletion has been included in the estimates. No Measured Mineral Resources are estimated.

The qualified person for the Mineral Resource estimates is Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultant. Mineral Resources are reported inclusive of Mineral Reserves. Dominion cautions that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Mineral Resources are reported effective 31 July 2016 on a 100% basis. Mineral Resource estimates are presented in Table 1-2 by kimberlite pipe.

Factors which may affect the Mineral Resource estimates include: diamond book price and valuation assumptions; changes to geological interpretations; changes to the assumptions used to estimate the diamond carat content; conceptual block cave and open pit design assumptions; geotechnical, mining and process plant recovery assumptions; diamond parcel sizes for the pipes with estimates that are not in production or planned for production; and the effect of different sample-support sizes between RC drilling and underground sampling.

Table 1-2: Mineral Resource Statement

Classification	Joint Venture Agreement Area	Kimberlite Pipe	Tonnes (millions)	Grade (cpt)	Carats (millions)
Indicated	Core Zone	Koala Underground	4.8	0.9	4.3
		Fox Underground	35.2	0.3	11.6
		Misery Main	3.4	5.4	18.3
		Pigeon	11.0	0.5	5.5
		Sable	15.4	0.9	14.3
		Stockpiles	1.0	1.1	1.1
Subtotal Indicated (Core Zone only)			*70.7*	*0.8*	*55.1*
Indicated	Buffer Zone	Jay	48.1	1.9	89.8
		Lynx	1.3	0.8	1.1
Subtotal Indicated (Buffer Zone only)			*49.5*	*1.8*	*90.9*
Total Indicated			***120.2***	***1.2***	***145.9***
Inferred	Core Zone	Koala Underground	0.3	1.7	0.6
		Fox Underground	2.0	0.4	0.8
		Misery Main	0.8	3.5	2.8
		Misery South	0.1	1.1	0.1
		Misery Southwest Extension	0.9	2.9	2.5
		Pigeon	1.7	0.4	0.8
		Sable	0.3	1.0	0.3
		Stockpiles	6.9	0.3	1.9
Subtotal Inferred (Core Zone)			*12.9*	*0.8*	*9.7*
Inferred	Buffer Zone	Jay	4.2	2.1	8.7
		Lynx	0.2	0.7	0.2
Subtotal Inferred (Buffer Zone)			*4.4*	*2.0*	*8.9*
Total Inferred			***17.3***	***1.1***	***18.6***

Notes to Accompany Mineral Resource Table.

1. Mineral Resources have an effective date of 31 July 2016. The Mineral Resources estimate was prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy. Mr. Ravenscroft is a Qualified Person within the meaning of National Instrument 43-101.
2. Mineral Resources are reported on a 100% basis. As at 31 July 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.
3. Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Mineral Resources are reported at +0.5 mm (based upon diamonds that would be recovered by the Ekati Bulk Sample Plant if it was operated with an effective 0.5 mm lower cut-off size and retained on a 1.0 mm circular aperture screen).

5. Mineral Resources have been classified using a rating system that considers drill hole spacing, volume and moisture models, grade, internal geology and diamond valuation, mineral tenure, processing characteristics and geotechnical and hydrogeological factors, and, depending on the pipe, may also include kriging variance.
6. Mineral Resources amenable to open pit mining methods include Misery, Pigeon, Sable, Jay and Lynx. Conceptual pit designs for open cut Mineral Resources (Misery, Pigeon, Sable, Jay and Lynx) were completed using Whittle shell analysis. Parameters used in pit shell analysis varied by kimberlite and ranges included: overall pit slope angles were selected to meet the particular design requirements for each pipe and range from 35–62º, mining costs of C$5–8/wmt, processing costs of C$16–26/dmt, general and administrative costs of C$17-29/dmt and diamond valuations that ranged from US$37–$230 per carat.
7. Mineral Resources amenable to underground mining methods include Koala and Fox Underground. Conceptual underground designs for Koala were based on a sub-level cave mining method utilising 20 m sub-levels and C$38–63/dmt operating cost. Conceptual underground designs for Fox were based on a 130 m deep block cave mining method and C$50-84/dmt operating cost. Operating costs vary by elevation within the deposits. Diamond valuations ranged from US$231–$311 per carat.
8. Stockpiles are located near the Fox open pit and were mined from the uppermost portion of the Fox open pit operation (crater domain kimberlite). Run-of-mine stockpiles (underground and open pit) are maintained at or near the process plant and are available to maintain blending of kimberlite sources to the plant.
9. Tonnes are reported as millions of metric tonnes, diamond grades as carats per tonne (cpt), and contained diamond carats as millions of contained carats.
10. Tables may not sum as totals have been rounded in accordance with reporting guidelines.

1.14 Targets for Further Exploration

Two targets for further exploration have been estimated, based on the allowance in National Instrument 43-101 Section 2.3 (2) to report the potential quantity and grade, expressed as ranges, of a target for further exploration. Dominion cautions that the potential quantity and grade of the targets for further exploration are conceptual in nature. There has been insufficient exploration and/or study to define the targets for further exploration as Mineral Resources. It is uncertain if additional exploration will result in the targets for further exploration being delineated as Mineral Resources.

1.14.1 Coarse Reject Tails

Coarse reject tails have been stockpiled at Ekati since the start of production in 1998 to the present. Several production periods have been identified during which high-grade feed sources were blended through the process plant using coarser de-grit screens (1.6 mm slot) compared to the current 1.2 mm configuration. In addition, the re-crush circuit was not utilised during these periods. A production test for grade and diamond recovery was completed in November 2013. A sample of 20,734 dmt was excavated from the coarse rejects dump and was treated through the main processing plant using the existing plant operating parameters. A total of 12,931 carats was recovered for an overall grade of 0.62 cpt. The diamond parcel was valued on the July 2013 Dominion Price Book and an average value of US$93 per carat was obtained. The parcel was re-priced on the June 2016 Dominion Price Book at an average price of US$84 per carat.

Based on the production trial, previous modeling, and depletion, the tonnage, grade and diamond value of the coarse rejects is estimated at 1.0 to 2.0 M dmt at 0.4 to 0.8 cpt and US$60 to $115 per carat, respectively. Coarse reject material was introduced to the plant feed in July 2014.

1.14.2 Misery Deep

Based on the current drilling information and production sampling of Misery Main kimberlite, the tonnage, grade, and diamond price of the Misery Deep exploration target (i.e. excluding the Indicated and Inferred Mineral Resources above 90 masl) is estimated at 1.2 to 2.6 dmt at 2.0 to 5.0 cpt and US$50 to US$80 per carat, respectively.

The exploration target is based on four RC drill holes and four diamond drill holes. There are four pierce points constraining pipe volume below 90 masl. The lowest elevation pierce point is at -22 masl.

1.15 Mineral Reserve Estimates

Mineral Reserve estimation is based on Indicated Mineral Resources and is generally supported by either a pre-feasibility-level or a feasibility-level study. Mineral Reserves were estimated for the Koala, Misery Main, Pigeon, Sable, Jay, and Lynx pipes, and active stockpile materials. Koala is mined as a sub-level/incline cave (SLC), similar to a block cave. The Misery open pit is undergoing a pushback, and the phase one open pit was completed at Pigeon in early 2016. Pre-stripping is underway at Lynx, whereas mining has not yet commenced at the Sable and Jay pits. The Panda, Koala, Beartooth, and Fox open pits are mined out. The Panda and Koala North underground mines are also fully depleted.

Geotechnical parameters used during open pit mine design include inter-ramp and inter-bench angles, structural domains determined from wall mapping, and geotechnical drilling. Underground geotechnical considerations are more focused on ground support, and monitoring of ground movement.

There are two types of waste dilution, internal and external, for the Ekati kimberlites; one is accounted for in the Mineral Resource block model and Mineral Resource estimate and the second is applied as part of Mineral Reserve estimation. The dilution and mining recovery factors for open pit operations have been applied based on operating experience gained since mining commenced in 1998. For underground operations, waste removal practices have been applied to the estimation of waste dilution and mining recovery, and include an assessment of the amount of waste rock visible such that ore-dominant draw points (≥75% kimberlite) are loaded to the crusher and conveyor system for delivery to the process plant. Waste rock dominant draw points (≤75% to ≥25% kimberlite) are designated as rocky ore and are stored separately in remucks then later hauled to the surface using the truck system where it is stockpiled for sorting by the surface ore sorters (backhoes) in good visibility conditions. Material with >75% granite is designated as waste and is hauled to the surface waste dumps.

Diamond recovery factors are applied based on parameters established during evaluation of recovered diamonds collected from bulk samples, and are specific to each kimberlite deposit and contained geologic domain. The process plant currently uses 1.2 mm slotted de-grit screen sizes and 0.85 mm slot dense media separation (DMS) sink screens. The overall diamond recovery for the processing plant is effectively 100% relative to the Ekati sample plant which uses 1.0 mm slot de-grit screen sizes. Ekati Mineral Resources are reported at 0.5 mm slot screen cut-off. For the Ekati Mineral Reserves, a diamond recovery factor is applied to normalize the grade from 0.5 mm slot screen basis to an effective 1.0 mm slot screen basis. In addition, from the start of FY18 (early 2017), Ekati will be operating a new Fines DMS circuit that will provide additional recovery of diamonds in the -3+1 and -5+3 DTC size classes.

1.16 Mineral Reserve Statement

Mineral Reserve estimates have been converted from material classed as Indicated Mineral Resources under the 2014 CIM Definition Standards. Consideration of the environmental, permitting, legal, title, taxation, socio-economic, marketing and political factors support the estimation of Mineral Reserves.

Mr. Peter Ravenscroft, FAusIMM, is the QP for the estimate. Mineral Reserves have an effective date of 31 July, 2016, and are reported on a 100% basis. Mineral Reserves are summarized in Table 1-3 by kimberlite pipe. No Proven Mineral Reserves have been estimated.

Factors which may affect the Mineral Reserve estimates include diamond price assumptions; grade model assumptions, underground mine design, open pit mine design, geotechnical, mining and process plant recovery assumptions, practical control of dilution, changes to capital and operating cost estimates and variations to the permitting, operating or social license regime assumptions, in particular if permitting parameters are modified by regulatory authorities during permit renewals.

Table 1-3: Mineral Reserves Statement

Classification	Joint Venture Agreement Area	Kimberlite Pipe	Tonnes (millions)	Grade (cpt)	Carats (millions)
Probable	Core Zone	Koala (underground)	2.3	0.6	1.3
		Misery (open pit)	2.8	5.2	14.7
		Pigeon (open pit)	6.6	0.5	3.2
		Sable (open pit)	12.0	0.8	10.1
		Stockpiles (surface)	1.0	0.8	0.8
Subtotal Probable (Core Zone only)			*24.7*	*1.2*	*30.2*
Probable	Buffer Zone	Jay (open pit)	44.7	1.8	78.6
		Lynx (open pit)	1.0	0.8	0.8
Subtotal Probable (Buffer Zone only)			*45.7*	*1.7*	*79.4*
Total Probable			***70.4***	***1.6***	***109.6***

Notes to Accompany Mineral Reserves Table.

1. Mineral Reserves have an effective date of 31 July 2016. The Mineral Reserves were prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy. Mr. Ravenscroft is a Qualified Person within the meaning of National Instrument 43-101.
2. Mineral Reserves are reported on a 100% basis.
3. Dominion is operator and as at 31 July 2016 has an 88.9% participating interest in the Core Zone Joint Venture area where Mineral Reserves are estimated for the Koala, Misery, Sable, and Pigeon kimberlites and stockpiled materials. Dominion is operator and as at 31 July 2016 has a 65.3% participating interest in the Buffer Zone Joint Venture area where Mineral Reserves are estimated for the Jay and Lynx kimberlites.
4. The reference point for the definition of Mineral Reserves is at the point of delivery to the process plant.
5. Mineral Reserves are reported at +1.0 mm (based upon diamonds that would be recovered by the Ekati Bulk Sample Plant using 1.0 mm slot de-grit screens and equivalent to the current Ekati process plant recovery) and inclusive of incremental small diamonds recovered by the fines dense media separation (Fines DMS) circuit which is scheduled for commissioning in late FY17.
6. Mineral Reserves that will be, or are mined using open pit methods include Misery, Pigeon, Sable, Lynx and Jay. Mineral Reserves are estimated using the following assumptions: Misery open pit design assumed dilution of 4% waste and mining recovery of 98% diluted material; Pigeon open pit design assumed dilution of 6% waste and mining recovery of 98% diluted material, Sable open design assumed dilution of 2% waste and mining recovery of 98% diluted material; Lynx open pit design assumed dilution of <2% waste and mining recovery of 98% diluted material; Jay open pit design assumed dilution of 2% waste and mining recovery of 98% diluted material.
7. Koala Mineral Reserves are mined using underground mining methods. The Koala Mineral Reserves estimate assumed an overall dilution of 4% and mining recovery of 87% of the diluted material.
8. Stockpiles are minor run-of-mine stockpiles (sourced from underground and open pit) that are maintained at or near the process plant and are available to maintain blending of kimberlite sources to the plant.
9. Tonnes are reported as metric tonnes, diamond grades as carats per tonne, and contained diamond carats as millions of contained carats.
10. Tables may not sum as totals have been rounded in accordance with reporting guidelines.

1.17 Mining Recovery

Mineral Reserves were estimated for the Koala, Misery, Pigeon, Sable, Jay and Lynx pipes, and active stockpile materials. Koala is mined as a sub-level/incline cave (SLC), similar to a block cave. Both Pigeon and Misery open pits have commenced production. The Lynx open pit started pre-stripping in 2015 and production is scheduled for early 2017. The Sable open pit is scheduled to start pre-stripping in 2018 and production in 2019. The Jay open pit is scheduled to start pre-stripping in 2021 and production in 2022.

1.17.1 Open Pit Mining

Dewatering of lake systems that have developed over the kimberlite pipes is generally required prior to commencement of open pit mining activities.

The kimberlite pipes at Ekati are approximately circular in plan view and are generally located within granite, a competent host rock. The ore–waste boundary is abrupt and is readily distinguished by rock type. Ultimate vertical mining depths are 300 m at Misery, 190 m at Pigeon, 300 m at Sable, 140 m at Lynx, and 360 m at Jay.

The open pits are currently mined using conventional truck-shovel operations and are developed in benches that are typically 10 m high. The Jay pit, due to the presence of overburden and significant resedimented kimberlite, will have double bench (30 m) configuration in granite and metasediment, single bench (15 m) configuration in kimberlite, and single bench (10 m) configuration in the overburden. Sable is planned on triple benches (3 x 10 m).

The open pits at Ekati are relatively small. Design pit slopes vary significantly between waste and kimberlite and are established based on detailed geotechnical and hydrogeological studies and operational requirements for each pipe. Phased mining has been used at the Misery and Pigeon pipes, and is planned for the Lynx and Jay pipes. Sable will be mined in a single pit phase.

A single circular access ramp around the perimeter of the pit is developed progressively as the benches are mined. Waste rock is hauled to a designated waste rock storage area and dumped to an engineered design. Kimberlite is hauled directly from the Pigeon pit benches to the process plant. For all other open pit operations, additional kimberlite storage and handling is required.

The main truck loading and haulage equipment currently in use are diesel hydraulic shovel/excavators with a bucket capacity of 12 m^3 and 90 t capacity off-road haul trucks. The Jay mine plan assumes 225 t capacity off-road haul trucks for ore and waste haulage. The main loading units selected for Jay were 17 m^3 loaders and 34 m^3 shovels.

1.17.2 Underground Mining

The Koala mine was developed with sub-levels spaced 20 m apart vertically and 5 m x 5 m draw points on a 14.5 m spacing (centre to centre). The highest elevation production sub-level is located at 2050L, approximately 160 m below the base of the former Koala open pit. Ore production from the draw points is a combination of the blasted kimberlite and caved kimberlite that lies above the blasted zone through to the pit. As production proceeds, the top of the cave zone below the pit is constantly being drawn down, and the level and profile of the surface expression of the cave zone is closely monitored. Below sub-level 1850L the mine transitions to an incline cave, with the lowest production level located at 1810L.

Kimberlite is transported from the mines via a 1.37 m wide conveyor system hung via chain from the back of the conveyor ramp. The system consists of four main underground conveyor sections plus a surface “stacker” conveyor, with a transfer arrangement between each conveyor. All production mucking is carried out using load haul dump (LHD) vehicles, tramming to the remuck bays or loading 45 t capacity diesel haulage trucks. Ore is dumped into an ore pass system, and fed to a 500 t/h primary mineral sizer before loading onto the 2.4 km long conveyor system from Koala to the process plant. On surface, the radial stacking conveyor discharges to an 8,000 t surface stockpile.

1.17.3 Grade Control

There are no grade control programs. However, grade verification of block models is carried out periodically by collecting and processing run-of-mine open pit development samples (typically 50 t each). Generally all kimberlitic material within the Mineral Resource models is considered to be economic, and is either processed directly or stockpiled for possible future processing.

1.17.4 Geotechnical

The major kimberlite lithologies in the production pipes have a wide range of measured strengths that range between very poor to upper fair rock mass (RMR) ratings. The granitic rocks and schist rocks at Ekati range between fair to excellent quality and the majority of the granite is good quality.

Separate geotechnical assessments have been conducted for each pipe that is being mined, and will be conducted on future deposits. These investigations are designed to quantify geotechnical domains in detail.

Geotechnical parameters used during open pit mine design include inter ramp, and inter-bench angles, structural domains determined from wall mapping and geotechnical drilling. Pit wall designs are reviewed using commercially available software to ensure appropriate wall angles, and catch bench widths are safe and efficient. The following geotechnical monitoring programs are performed in the active open pits: observational logs; instrumentation including prism, time domain reflectometry (TDR), thermistors and multi-point borehole extensometer (MPBX); photogrammetry; mapping; slope stability radar (SSR) and the use of regular field inspections by geotechnical engineers.

Underground geotechnical considerations are more focused on ground support, and monitoring of ground movement. The following underground geotechnical programs are in place in to ensure the long term stability of infrastructure required for the continuation of underground mining at Ekati: drive closure monitoring; surveillance photographs; structural mapping; and instrumentation including extensometers, thermistors, TDR and "smart cable" extensometer-enabled cable bolts. Daily visual inspections of ground and ground support conditions in development and production workings are also an integral part of the geotechnical program.

1.17.5 Hydrogeological

As host rocks have been faulted and overprinted there is potential for hydraulic conductivity or storage. Kimberlite has very low hydraulic conductivity (measured at Koala, Panda, Misery and Fox pits) and the intensity of kimberlite fracturing has little effect; however, kimberlite has a high storage capacity due to its porosity. The chemical properties of groundwater collected and pumped from the underground are monitored.

Studies conducted indicate that groundwater is currently not recharged from surface water bodies at an observable rate.

1.18 Process Recovery

The Ekati processing plant had an original design capacity of 9,000 dmt/d. Through various efficiency improvements, the current capacity and budgeted operating rate is 10,800 dmt/d with an overall equipment efficiency (OEE) of 83.4% (fiscal year 2017). Further efficiency improvements are planned to achieve 12,000 dmt/d in conjunction with the Jay project.

The recovery of diamonds from the processing of the host kimberlite ore at the Ekati Diamond Mine includes:

- Primary crushing—redundancy with primary, secondary, and reclaim sizers;
- Stockpiling—used as a buffer between plant and crushing;
- Secondary crushing (wet cone crusher);
- Tertiary crushing and re-crushing for further diamond liberation using high pressure grind rolls (HPGR);
- Sizing, de-gritting, and desanding;
- Dense media separation (DMS);
- Final recovery:
  - Wet high-intensity magnetic separation;
  - Wet X-ray sorting;
  - Drying;
  - Dry single particle X-ray sorting;
  - Grease tables;
  - Diamond concentrate weighing and packaging, sorting, and preparation for transport to the Yellowknife sorting and valuation facility.

A sample plant adjacent to the processing plant building is routinely used for diamond recovery audits and for grade control.

A Fines DMS section is presently undergoing construction (for commissioning in early 2017). This section is designed on the basis of a conventional DMS layout and is for the recovery of diamonds in the -1.2 mm +0.65 mm size range from the discharge of the desanding screen. The design capacity is 120 dmt/h. Concentrate from this section will be treated over grease tables to further improve the diamond concentrate by weight before caustic fusion and acid treatment on site. The design has taken into account that any downtime in the Fines DMS does not affect the OEE of the main treatment plant.

1.19 Infrastructure

Ekati is an operating mine and key infrastructure on site includes open pits, underground mines, sample and process plants, waste rock storage and processed kimberlite storage facilities, buildings (mobile and permanent), pipelines, pump stations, electrical systems, quarry site, camp pads and lay-downs, ore storage pads, roads, culverts and bridges, airstrip, helipad, and mobile equipment.

Waste rock storage areas are designed for placement of rock excavated from the open pits and underground mine; rock stored is primarily granite. Waste rock storage areas also contain and store other materials including coarse kimberlite rejects, low grade kimberlite stockpiles, metasediments, land-fill, and land-farm. There is sufficient space in the waste rock storage areas for life-of-mine (LOM) requirements.

Temporary kimberlite stockpile areas will be required during the operations of the Jay project. Due to the greater distance from the Sable pit to the process plant, ore will also be stockpiled in the vicinity of the Sable pit.

Fine processed kimberlite is deposited into the Long Lake Containment Facility and the mined-out Beartooth pit. The containment cell expansions and Beartooth pit will provide capacity to 2019 with the mined-out Panda, Koala and Fox pits available to provide additional capacity beyond that date. Fine processed kimberlite from the Jay and Sable pits will be deposited in the mined-out Koala and Panda open pits and associated underground workings.

Due to the low value of the coarse processed kimberlite relative to the existing stockpiles, the increasing haul distances of waste rock storage area deposition as the coarse stockpiles from Jay and Sable grow in size, and the reclamation benefits of in-pit deposition and co-deposition of fine and coarse processed kimberlite is the recommended alternative.

Three primary water diversion structures have been constructed at Ekati, the Bearclaw Lake dam and pipeline, Panda diversion dam and channel, and Pigeon stream diversion. Two water management structures are required at Sable, the Two Rock dam, and the Two Rock filter dike. Mining of the Jay pipe will require construction of the Jay and North dikes, and the Sub-Basin B diversion channel.

Open pit mine water is collected via the in-pit dewatering systems that are designed to maintain safe and reliable operations in active mining areas. Water that enters the underground mining operations is managed through a series of sumps that ultimately direct the underground mine water to a single dewatering sump from where it is pumped to surface. Surface mine water (run-off over mine areas that is collected in various sumps) is pumped or trucked to the Long Lake Containment Facility. Misery pit water is pumped to the King Pond Settlement Facility.

The operations are not on a commercial power grid. Diesel generators on site provide power to the mining operations and ancillary facilities. A new 69 kV transmission line is under construction from Ekati Camp to Misery Camp. The construction is nearing completion as of the end of July 2016, and the line is scheduled to be energized in

September 2016. From that point onward, Misery infrastructure power requirements will no longer require the stand-alone diesel generators.

Freshwater for Ekati operations is permitted to be drawn from Grizzly Lake, Little Lake, Thinner Lake (Misery Camp), and Two Rock Lake. The Long Lake Containment Facility and Two Rock Sedimentation Pond are makeup sources for process use as required.

Site-wide communications consist of radio, phone, local area network (LAN), wireless internet and mining fleet management systems. Onsite communications are provided by microwave link from Yellowknife to Ekati.

1.20 Mine Plans

The Report presents two mine plans and two economic analyses based on those mine plans. The Mineral Reserves Base Case Mine Plan is the base case mine plan for the Project, and is based on Mineral Reserves only. This plan assumes production from Misery, Pigeon, Sable, Lynx and Jay open pits, and the Koala underground operation.

The Operating Case Mine Plan is a scenario that has the Misery South and Misery Southwest Extension material included in addition to that in the Mineral Reserves Base Case Mine Plan. Investors are cautioned that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability and are further cautioned that the Operating Case Mine Plan includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the Operating Case Mine Plan will be realized.

1.21 Markets and Contracts

Dominion has significant expertise in marketing diamonds, and therefore does not use third parties to value its goods, but relies entirely upon its own sorting and valuation methods for internal analysis, mine planning, and financial modelling.

No forward market for rough diamonds exists to provide external long run pricing trends. The reasons for this are rooted in the lack of homogeneity in quality and absence of agreed standards for classifying and pricing the diamonds. Consequently, diamond price forecasts are dependent upon the fundamental views of future supply and demand. Various independent diamond market forecasts are produced by specialist companies, financial institutions, and respected major consulting firms, such as McKinsey & Company and Bain & Company. Dominion regularly reviews these reports together with its own market intelligence when formulating its own view of future diamonds prices. Universally, all diamond market forecasts predict that supply will be constrained. Mid- to long-term production levels are well understood given that most of the major sources are already in production and new developments that are in the pipeline are well defined.

Nearly all commentators have supply gradually rising for five years but at a lower rate than the growth in demand, resulting in modest growth in rough diamond prices. Although production peaks around 2019–2020 (but to a level still below pre-global crisis levels), demand is expected to continue to grow, resulting in a widening of the supply–demand gap that will likely lead to higher diamond price increases. The implication is that rough diamond prices would have to increase at an average nominal rate of around 6.8% per annum to bridge the demand gap.

On the basis that the consensus view is of a healthy and continued demand growth against a long-term supply constraint, Dominion uses a base case rough diamond price rising at a long-term average rate of 2.5% per annum in real terms from CY2017 (start of FY18) for the whole life of the project.

The Ekati Mine has a Socio-Economic Agreement with the Government of the Northwest Territories, along with Impact and Benefit Agreements with local aboriginal groups. Within these agreements, the Ekati Mine has committed to developing contracts with Northern and Aboriginal businesses, wherever commercially viable. Furthermore, the Ekati Mine is committed to supporting and developing sustainable businesses, and encourages local and Aboriginal business owners to examine opportunities to develop joint ventures with existing and established businesses.

1.22 Capital and Operating Cost Estimates

1.22.1 Capital Costs

The capital cost estimate is the same for the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan. Estimated capital costs for the Ekati Mine are summarized in Table 1-4. These totals are exclusive of capital expenditures during 1H FY17, and exclusive of capital allocations and pre-stripping costs.

Table 1-4: Capital Cost Estimate ($C million)

Cost Area	Cost
Jay Project	825
Sable Project	148
Other Development	29
Sustaining Capital Costs	436
Total Capital Costs	***1,437***

Note: Totals may not sum due to rounding

1.22.2 Operating Costs

Operating cost estimates have been produced for both the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan.

Mining costs include direct open pit and underground mine operating costs as well as mobile maintenance, fixed plant maintenance related to the underground, and mine technical services. Pre-stripping costs at Lynx, Sable, and Jay prior to commercial production will be capitalized for accounting purposes, but are included in the mining operating costs below for the purposes of the economic analysis in this report.

Processing costs include processing plant operations, power consumption related to the process plant, and fixed plant maintenance related to the process plant.

Camp costs include communications, site management, training, project engineering services, maintenance engineering and planning, electrical services, maintenance services, power consumption not related to the process plant, travel, contracts and purchasing, catering and cleaning, warehouse, health and safety, security, site services, and strategic planning.

General and administrative (G&A) costs include administration, information technology, environment and communities, external affairs, finance, human resources, and legal.

Reclamation and marketing costs are not included in total operating costs.

The operating cost estimate for the Mineral Reserves Base Case Mine Plan is included as Table 1-5 and the Operating Case Mine Plan estimate is provided in Table 1-6.

Table 1-5: Mineral Reserves Base Case Mine Plan Operating Costs (C$ million)

Cost Area	Costs
Mining Costs	2,868
Processing Costs	1,119
Camp and G&A Costs	2,475
Total Operating Costs	***6,463***

Note: Totals may not sum due to rounding

Table 1-6: Operating Case Mine Plan Operating Costs (C$ million)

Cost Area	Costs
Mining Costs	2,879
Processing Costs	1,139
Camp and G&A Costs	2,475
Total Operating Costs	***6,492***

Note: Totals may not sum due to rounding

1.23 Economic Analysis

The results of the economic analysis to support Mineral Reserves represent forward-looking information that is subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Forward-looking statements in this Report include, but are not limited to, statements with respect to future diamond valuations and diamond sales contracts, the estimation of Mineral Reserves and Mineral Resources, the realization of Mineral Reserve estimates, the timing and amount of estimated future production, costs of production, capital expenditures, costs and timing of the development of new kimberlite pipes, permitting time lines for development of new pipes or treatment of stockpiles, requirements for additional capital, exchange rate assumptions, in particular Canadian/US dollar exchange rate, government regulation of mining operations, accidents, labour disputes and other risks of the mining industry, environmental risks, unanticipated reclamation expenses, continuation of the social licence to operate, and title disputes or claims.

Without limiting the generality of the above risk statements, some specific risks can come from changes in parameters as mine and process plans continue to be refined. These include possible variations in Mineral Resource and Mineral Reserve estimates, grade or recovery rates; diamond reference price estimate assumptions; geotechnical considerations during mining and geotechnical and hydrogeological considerations during Jay Dike construction and operation, including impacts of mud rushes, pit wall failures, or dike integrity; failure of plant, equipment or processes to operate as anticipated if granite or clay content of ore increases over the assumptions used in the mine plan; modifications to existing practices so as to comply with any future permit conditions that may be imposed by the appropriate regulator; and delays in obtaining regulatory approvals and lease renewals.

Investors are cautioned that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability and are further cautioned that the Operating Case Mine Plan includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the Operating Case Mine Plan will be realized.

To support estimation of Mineral Reserves, Dominion prepared an economic analysis to confirm that the economics based on the Mineral Reserves could repay life-of-mine operating and capital costs. The Ekati Diamond Mine was evaluated on an after-tax, project stand-alone, 100% equity-financed basis at the project level, using diamond valuations as at 30 June, 2016 and a 7% discount rate. The model was prepared starting in the second half of fiscal year 2017.

The financial analysis is based on two cases.

- The Mineral Reserves Base Case Mine Plan is based on Probable Mineral Reserves of 70.3 dry Mt grading 1.6 cpt. The mine life based on the Mineral Reserves Base Case Mine Plan is 17 years, to FY34;
- The Operating Case Mine Plan is based on Probable Mineral Reserves of 70.3 dry Mt grading 1.6 cpt, and Inferred Mineral Resources in the Misery South and Misery Southwest Extension areas of 1.2 dry Mt grading 2.6 cpt. The Operating Case Mine Plan also has a mine life of 17 years, to FY34.

The Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan capital costs are estimated at $984 million of development capital and $436 million of sustaining capital for each plan.

Direct and indirect operating costs are estimated at $6,420 million in the Mineral Reserves Base Case Mine Plan, and $6,494 million in the Operating Case Mine Plan. Marketing costs, royalty payments and estimated reclamation costs are included as separate line items to the operating cost estimate in the financial analysis.

The Northwest Territories royalty payable (NWT Royalty) is the lessor of (i) 13% of the value of output of the mine, or (ii) an amount calculated based on a sliding scale of royalty rates dependent upon the value of output of the mine, ranging from 5% for value of output between $10,000 and $5 million to 14% for value of output over $45 million. For modelling purposes an illustrative NWT Royalty calculation has been used, calculated as 13% of modelled free cash flow.

The taxation treatment in the economic analyses is applied to the Ekati Diamond Mine as a stand-alone whole entity and on a simplified basis. The joint venture partners in the Ekati Diamond Mine are separate parties, each of which are responsible for their own corporate income taxes. For modelling purposes an illustrative income tax calculation has been used calculated as 26.5% of modelled free cash flow post Northwest Territory royalty. The 26.5% rate is based on the 2016 Federal corporate income tax rate of 15% and the 2016 Northwest Territories corporate income tax rate of 11.5%.

Results of the financial analysis using the Mineral Reserves Base Case Mine Plan indicated positive economics until the end of mine life in FY34, and supported the declaration of Mineral Reserves. Over the life of mine outlined in the Mineral Reserves Base Case Mine Plan, assuming a 7% discount rate, the net present value (NPV) is $1.14 billion and the pre-tax cumulative cash flow is $4.43 billion.

In the Operating Case Mine Plan, also assuming a 7% discount rate, the NPV is $1.2 billion and the pre-tax cumulative cash flow is $4.52 billion.

For both the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan, given that the mine is generating an immediate positive cash flow, payback period and internal rate of return (IRR) calculations are not relevant.

Table 1-7 provides a life-of-mine summary for the Mineral Reserves Base Case Mine Plan. Table 1-8 provides the life-of-mine summary for the Operating Case Mine Plan.

Table 1-7: Economic Analysis Summary, Mineral Reserves Base Case Mine Plan

Area	Item		Mineral Reserve Base Case Mine Plan Totals
Waste mined (wMt)		Total	305.64
Ore mined (wMt)		Total	75.01
Ore processed (dMt)	Underground	Koala	2.40
	Open Pit	Misery	2.93
		Pigeon	7.31
		Sable	11.98
		Lynx	0.99
		Jay	44.67
Grade (cpt)	Underground	Koala	0.54
	Open Pit	Misery	5.15
		Pigeon	0.47
		Sable	0.85
		Lynx	0.77
		Jay	1.76
Carats recovered (Mcts)	Underground	Koala	1.30
	Open Pit	Misery	15.07
		Pigeon	3.46
		Sable	10.15
		Lynx	0.76
		Jay	78.64
Revenue	Average Price	US$ / ct	Variable by year
	Exchange Rate	US$ / C$	0.75
	Cash Inflow	C$ M	12,785
Costs	Development Capital	C$ M	1,002
	Sustaining Capital	C$ M	436
	Total Operating Costs	C$ M	6,463
	Reclamation Costs	C$ M	277
	Marketing Costs	C$ M	240
	Cash Outflow	C$ M	8,416
Net Cash Flow before Taxes		C$ M	4,368
Tax	NWT Royalty (13% of pre-tax free cash flow)	C$ M	640
	Income tax (26.5% of post-NWT royalties free cash flow)	C$ M	1,136
Cash Flow	Revenue less Costs	C$ M	2,592
	Net Present Value at 7% discount rate	C$ M	1,102

Table 1-8: Economic Analysis Summary, Operating Case Mine Plan

Area	Item		Operating Case Mine Plan Totals
Waste mined (wMt)		Total	305.64
Ore mined (wMt)		Total	75.01
Mill feed mined (wMt)		Total	1.00
Ore processed (dMt)	Underground	Koala	2.40
	Open Pit	Misery	2.93
		Pigeon	7.31
		Sable	11.98
		Lynx	0.99
		Jay	44.67
Mill feed processed (dMt)		Misery South	0.12
		Misery SW Ext.	1.04
Grade (cpt)	Underground	Koala	0.54
	Open Pit	Misery	5.15
		Pigeon	0.47
		Sable	0.85
		Lynx	0.77
		Jay	1.76
		Misery South	1.23
		Misery SW Ext.	2.80
Carats recovered (Mcts)	Underground	Koala	1.30
	Open Pit	Misery	15.07
		Pigeon	3.46
		Sable	10.15
		Lynx	0.76
		Jay	78.64
		Misery South	0.14
		Misery SW Ext.	2.92
Revenue	Average Price	US$ / ct	Variable by year
	Exchange Rate	US$ / C$	0.75
	Cash Inflow	C$ M	12,950

Area	Item		Operating Case Mine Plan Totals
Costs	Development Capital	C$ M	1,002
	Sustaining Capital	C$ M	436
	Total Operating Costs	C$ M	6,492
	Reclamation Costs	C$ M	277
	Marketing Costs	C$ M	240
	Cash Outflow	C$ M	8,446
Net Cash Flow before Taxes		C$ M	4,504
Tax	NWT Royalty (13% of pre-tax free cash flow)	C$ M	653
	Income tax (26.5% of post-NWT royalties free cash flow)	C$ M	1,159
Cash Flow	Revenue less Costs	C$ M	2,692
	Net Present Value at 7% discount rate	C$ M	1,188

Notes to Accompany Cash Flow Tables:

(1) Value by pipe weighted by production from each pipe.

(2) Tax calculation is illustrative (i.e. applies basic taxes on the year that production and revenue is incurred).

(3) The cash flow tables are provided on a 100% ownership basis. As at 31 July 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.

1.24 Sensitivity Analysis

The sensitivity of the Ekati Project under the Mineral Reserves Base Case Mine Plan assumptions to changes in diamond price, diamond grade, operating costs, capital costs and Canadian/US dollar exchange rate is summarized in Table 1-9. The sensitivity of the mine under the Operating Case Mine Plan assumptions is summarized in Table 1-10. In both tables, net present value (NPV) at a 7% real discount rate is used as the indicator to evaluate the impact of varying the diamond prices, the grade, the capital costs, the operating costs and the Canadian/US dollar exchange rate on the Ekati Project economics. For the variables in the sensitivity analysis, a ±10% change was applied.

Table 1-9: NPV Sensitivity Analysis under Mineral Reserves Base Case Mine Plan (estimate base case is highlighted)

Parameter	Financial Sensitivity NPV ($ Million)		
	- 10% Change	Base Case	+ 10% Change
Price	583	1,102	1,600
Grade	583	1,102	1,600
Capital Costs	1,191	1,102	1,013
Operating Costs	1,399	1,102	798
US$/C$ Foreign Exchange Rate	1,655	1,102	632

Table 1-10: NPV Sensitivity Analysis under Operating Case Mine Plan (estimate base case is highlighted)

Parameter	Financial Sensitivity NPV ($ Million)		
	- 10% Change	Base Case	+ 10% Change
Price	679	1,188	1,688
Grade	679	1,188	1,688
Capital Costs	1,271	1,188	1,106
Operating Costs	1,479	1,188	896
US$/C$ Foreign Exchange Rate	1,743	1,188	726

The analysis demonstrated that the Ekati Diamond Mine is most sensitive to variations in exchange rate, diamond parcel valuations and diamond grades, less sensitive to fluctuations in operating costs, and least sensitive to changes in the capital cost assumptions.

1.25 Conclusions

Mineral Resources are estimated for the Koala, Fox, Misery Main, Misery South, Misery South Extension, Pigeon, Sable, Jay and Lynx kimberlite pipes. Mineral Reserves were estimated for the Koala, Misery, Pigeon, Sable, Jay and Lynx pipes, and active stockpile materials. Based on the Mineral Reserve estimates and the assumptions detailed for the Mineral Reserves Base Case Mine Plan in this Report, the Ekati Project has positive project economics to fiscal year 2034, when the current Mineral Reserves will be exhausted.

Mineral Resources that are not included in either the current Mineral Reserve Base Case Mine Plan or the Operating Case Mine Plan include a portion of Koala underground, Misery Deep and Fox Deep. Of these deposits, Misery Deep represents the most significant opportunity, due to its high estimated diamond grade, potential for development below the existing open pit, and advanced permitting. The coarse reject tails, along with Mineral Resources estimated for the additional levels at the Koala underground, Misery Deep and Fox Deep represent future plant feed upside potential, and some or all of this mineralization may be able to be incorporated in the life-of-mine plan once sufficient additional work has been undertaken. There is also upside potential to treat low-grade stockpiles, primarily derived from open pit mining at the Fox kimberlite if the grades in the stockpiles can be demonstrated to be economic.

1.26 Recommendations

A single-phase, multi-part work program has been outlined. No portion of the work program is dependent on the results of completion of another. The total program is estimated to cost approximately $10 million. The program is recommended to include the following:

- For the current operations, the recommended work includes diamond drilling at Misery Main, completion of a revised Mineral Resource estimate for Misery Main and Pigeon, assessments of the most appropriate methodologies to access the Misery Deep kimberlite, and completion of a production trial and bulk sample testing at the Lynx pit. This work is estimated at approximately $1.9 million;
- Additional infill geotechnical drilling to finalize the pit design prior to mining is recommended for the Sable project, at an estimated cost of $1.6 million;
- The Jay project recommendations include confirmatory geotechnical drilling completed along the dike alignment, and additional infill geotechnical drilling to finalize the pit design prior to mining. A budget of about $5.1 million will be required to complete the work;
- In support of estimating Mineral Resources for the Fox Deep zone, the following work program, estimated at $800,000, is suggested: complete sample processing and analysis for RC samples collected in winter 2016; update Fox resource block model; and complete a scoping study to assess the potential large-scale underground development;
- Work proposed for the process plant area comprises capital studies to improve the ability of the front-end of the process plant to handle kimberlite with high clay content, with an estimated cost of about $600,000.

2.0 INTRODUCTION

Mr. Jon Carlson, P. Geo., Mr. Peter Ravenscroft, FAusIMM, Mr. Chantal Lavoie, P. Eng., and Mr. John Cunning, P. Eng., (collectively the Qualified Persons, or QPs) on behalf of Dominion Diamond Corporation (Dominion), have prepared a technical report (the Report) on the Ekati Diamond Mine (also referred to as the Ekati Mine or the Project) in the Northwest Territories, Canada (Figure 2-1).

Figure 2-1: Project Location Plan

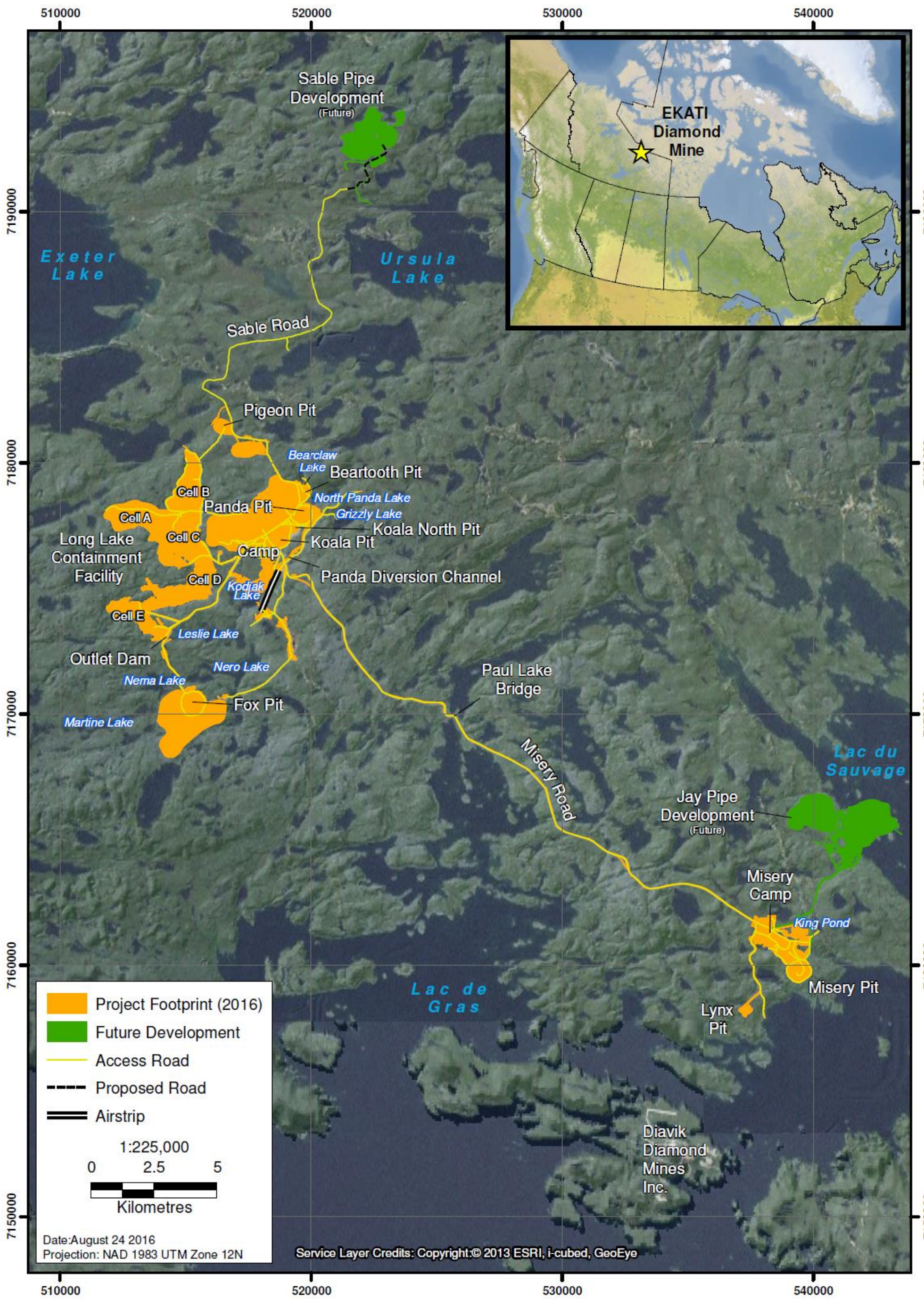


Figure prepared by Dominion, 2016.

The Ekati Mine was acquired from BHP Billiton Canada Inc. (BHP Billiton) on 10 April, 2013 and included BHP Billiton's controlling interest in the Ekati Diamond Mine as well as the associated diamond sorting and sales facilities in Yellowknife, Northwest Territories and Antwerp, Belgium.

Dominion uses a wholly-owned subsidiary, Dominion Diamond Holdings Ltd., as the holding entity for the Ekati Mine in the Northwest Territories. The participating entities for the Ekati Mine is Dominion Diamond Ekati Corporation, an indirectly wholly-owned subsidiary of Dominion Diamond Holdings Ltd. In this Report, the name Dominion is used interchangeably for the parent and subsidiary companies.

2.1 Terms of Reference

This Report is being filed by the Corporation on a voluntary basis as contemplated under section 4.2(12) of the Companion Policy to National Instrument 43-101 *Standards of Disclosure for Mineral Projects*. The Report is being filed by the Dominion to provide updated scientific and technical information in respect of the Ekati Diamond Mine and not as a result of a requirement under NI 43-101.

2.2 Qualified Persons

The following serve as the qualified persons (QPs) for this Technical Report as defined in National Instrument 43-101, Standards of Disclosure for Mineral Projects:

- Mr. Jon Carlson, P. Geo., Senior Manager of Strategic Planning for the Ekati Operation, Dominion;
- Mr. Peter Ravenscroft, FAusIMM, Burgundy Mining Advisors Ltd.;
- Mr. Chantal Lavoie, P. Eng., Chief Operating Officer of Dominion, and President of Dominion Diamond Ekati Corporation (DDEC);
- Mr. John Cunning, P. Eng., Principal, Geotechnical Engineer, Golder Associates Ltd., (Golder).

2.3 Site Visits and Scope of Personal Inspection

The responsible QPs have either visited site on the dates indicated below, or are full-time employees at the mine.

Mr. Jon Carlson has worked at the Ekati Project site for 24 years. His QP scope of personal inspection of the site has been undertaken as part of his role as the Senior Manager of Strategic Planning. Mr. Carlson has visited kimberlite occurrences, supervised exploration programs during the period where exploration was active on the Ekati Project; inspected drill core and RC cuttings, visited drill platforms and sample cutting and logging areas; visited bulk sample sites; discussed geology and mineralization with Ekati Project staff; reviewed geological interpretations with staff; supervised and reviewed modeling efforts; audited and reviewed on-site data including reviews of budgets, exploration programs and sample results; visited the open pit and underground workings; and viewed the locations of key infrastructure.

Mr. Peter Ravenscroft has visited the site on several recent occasions including from January 11–14, 2016, June 25, 2015, March 10–13 2014, and November 3–6 2014. He has visited mine operations at Koala underground mine, Misery open pit mine, and Pigeon open pit mine, and has examined the processing plant during three of the site visits. He inspected the Jay project site during the 2014 drilling campaign and visited the bulk sample plant in 2014 and 2015. Mr. Ravenscroft has held extensive discussions with Dominion corporate personnel, as well as with Ekati management, geological, mining, processing and strategic planning staff. In addition in his capacity as a consultant to Dominion he has conducted detailed technical work, including reviews of all relevant resource models and supervision of updated resource estimation for the Jay, Sable, Fox and Misery Satellite pipes.

Mr. Chantal Lavoie has worked at the Ekati Project for three years. His QP scope of personal inspection of the site has been undertaken as part of his role as Dominion's Chief Operating Officer and the President of DDEC. In this role, Mr. Lavoie has the overall responsibility for the operational activities at the Project site including mine technical services (geology, geotechnical, mine, planning and scheduling), surface and underground mining, processing, maintenance and associated support services. He participates directly in all aspects associated with the execution of annual business plans; has performed detailed reviews of operational performance, process plant efficiencies, mining technical designs and financial performance; participates in discussions and the decision processes associated with long-term strategic planning.

Mr. John Cunning visited the site from January 20 to 23, 2014, as part of preparations and planning for the Jay Project winter 2014 geotechnical and hydrogeological drilling program and again from August 5 to 6, 2015, for a Jay Project planning meeting and risk assessment. In his capacity as a consultant to Dominion he has supervised the capital development cost estimates for the construction of the proposed Jay Dike and its associated infrastructure, including roads and pumping infrastructure.

2.4 Effective Dates

There are a number of effective dates pertinent to the Report, as follows:

- Database close-out date for Koala, Fox, Pigeon, Misery Main, Misery South, Misery Southwest Extension, Sable, Jay, Lynx and stockpile material: 31 July, 2016;
- Effective date of the Mineral Resource estimates: 31 July, 2016;
- Effective date of the Mineral Reserve estimates: 31 July, 2016;
- Date of the supply of the last information on mineral tenure and property ownership: 31 July, 2016;
- Date of the economic analysis that supports Mineral Reserve estimation: 31 July, 2016.

The overall Report effective date is taken to be 31 July, 2016, and is based on the date of the Mineral Reserve estimates and the economic analysis supporting the Mineral Reserves.

2.5 Information Sources and References

The primary data sources for Report compilation include:

- Competent Persons Reports that were prepared by Ekati staff on an annual basis from 1993 to 2012 for the previous owner, BHP Billiton;
- Mineral Services Canada Inc., 2015: Misery Satellites, 2015 Resource Estimates: report prepared for Dominion, February, 2015;
- Dominion Diamond Corporation, 2016: Sable Pipe Prefeasibility Study (PFS): report prepared for Dominion, February, 2016
- Dominion Diamond Corporation and Golder Associates Ltd., 2016: Jay Project Feasibility Study (FS): report prepared for Dominion, June, 2016.

Dominion has also used the information and references cited in Section 27 as information sources for the Report.

Additional information on the operations was provided to the responsible QPs from Dominion and Ekati employees in specialist discipline areas as required. Selected Golder and Mineral Services Canada Inc. (Mineral Services) staff also provided input in the areas where the companies had provided specialist services in support of the Jay feasibility study and the Mineral Resource estimate for the Misery South and

Misery Southwest Extension kimberlites, respectively. Mineral Services staff also contributed to Section 7.

The Report uses Canadian English and the metric system of units unless otherwise noted.

Cost estimates are provided as Canadian dollar figures unless otherwise indicated. The feasibility study for the Jay kimberlite was prepared primarily using Canadian dollars, however, US dollars were used for some estimates. The news release dated 6 July, 2016 on the Jay project assumed a Canadian dollar to US dollar exchange rate of 1.33 for the duration of construction and operation.

The Jay feasibility study used metric units. The Mineral Resource estimate for the Misery pipe and satellite deposits also used metric units.

All figures and illustrations have been prepared by Dominion staff for inclusion in this Report unless otherwise noted.

The underground mining operations use a modifying factor to convert metres above sea level (masl) elevations to mining levels, whereby the number 2,000 is added to masl. Thus the underground 1800L would correspond to -200 masl and the 1770L corresponds to the -230 masl.

Calendar years (January to December) are used for Project milestone dates. Dominion uses a fiscal year (FY) for financial information and life-of-mine plans; this year runs from February of one year to January of the following year, such that FY17 runs from February 2016 to January 2017 and there is only one month of calendar year 2017 in Dominion's 2017 fiscal year.

Mineral Resource, Mineral Reserve, mine plan, capital and operating cost and economic analysis data, tables, and figures in the Report are presented on a 100% ownership basis.

2.6 Exemptive Relief Approval

Dominion applied for, and was granted, exemptive relief from the Ontario Securities Commission, as principal regulator, on July 18, 2014, in relation to the inclusion of Misery South and Misery Southwest Extension Inferred Mineral Resources in the alternate economic analysis plan termed the Operating Case Mine Plan, discussed in Section 16, Section 21 and Section 22 of the Report.

2.7 Previous Technical Reports

Dominion has previously filed the following technical reports on the Ekati Project:

- Heimersson, M., and Carlson, J., 2013: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 10 April 2013.
- Carlson, J., Ravenscroft, P., Lavoie, C., and Cunning, J., 2015: Ekati Diamond Mine, Northwest Territories, Canada, NI 43-101 Technical Report: Report prepared for Dominion Diamond Corporation, effective date 31 January, 2015.

3.0 RELIANCE ON OTHER EXPERTS

This section is not relevant to the Report as advice was sought from Dominion's internal experts in the fields of legal, political, environmental, and tax matters relevant to the technical report as required in support of Report preparation.

4.0 PROPERTY DESCRIPTION AND LOCATION

The Ekati Diamond Mine is located near Lac de Gras, approximately 300 km northeast of Yellowknife and 200 km south of the Arctic Circle in the Northwest Territories of Canada.

The approximate Ekati Project centroid is located at 64.7ºN, 110.6ºW, which is the location of the Ekati airstrip. The project coordinate system adopted for x and y locations is UTM Zone 12 tied to a NAD 83 datum.

4.1 Property and Title in the Northwest Territories

Information in this subsection is based on data in the public domain (Aboriginal Affairs and Northern Development Canada, 2014; Government of the Northwest Territories, 2014; and Fasken Martineau DuMoulin, 2006), and has not been independently verified by the responsible QPs.

The Northwest Territories has undergone a period of devolution, which resulted during April 2014 in the transfer of primary authority over most public lands, resources and waters in the Northwest Territories from the Government of Canada to the Government of the Northwest Territories (GNWT).

4.1.1 Mineral Tenure

Mineral rights in the Northwest Territories are held by the Government. Under the current legislation (Northwest Territories and Nunavut Mining Regulations) in the Northwest Territories and Nunavut, there are four types of mineral tenure:

- Licence to Prospect;
- Permit to Prospect;
- Mineral Claim;
- Mining Lease.

4.1.1.1. Licence to Prospect

A license grants the holder the right to prospect for minerals on public lands open for mineral exploration. Licences are granted on an annual basis.

4.1.1.2. Permit to Prospect

A Permit to Prospect allows a prospector to explore for minerals in a three-year period for areas located south of the 68^{th} parallel of north latitude and for a five-year period for areas located north of the 68^{th} parallel. The areas are one quarter of a mineral claim staking sheet (1:50,000 scale map) and vary in size from 8,319 to 22,900 ha. Any area of further interest to the holder must be converted to a mineral claim(s) prior to permit expiry provided the work requirements for the specified period have been completed.

4.1.1.3. Mineral Claim

The area of a mineral claim cannot exceed 2,582.5 acres (1,045 ha). A mineral claim includes all areas lying within its boundaries, including those covered by water.

A mineral claim staked can be held for up to 10 years from the date of recording. If not converted to a mineral lease on or before the 10 year grant-date anniversary, the claim will lapse.

One of the requirements to take a mineral claim to lease includes a legal survey to demarcate the boundaries of the mineral claim.

To register a claim it must be physically staked by marking the corners and the boundaries of a rectangular area with posts in accordance with the Northwest Territories and Nunavut Mining Regulations.

Once a mineral claim is properly located, the locator must record the mineral claim with the Mining Recorder with 60 days from the date of locating the claim. The application includes a sketch map showing the position of the claim, and a fee equal to $0.10 per acre ($0.25/ha) for the area contained within the claim. After a mineral claim is recorded, the holder must perform representation work to keep the claim in good standing. During the two-year period immediately following the date the mineral claim is recorded, the holder must perform representation work of at least $4.00 per acre. During each subsequent one year period, the holder must perform representation work of at least $2.00 per acre.

To maintain the mineral claim, within 30 days of the anniversary of the claim, the holder has to submit a statement of representation work, an assessment report, and pay a fee of $0.10 per acre ($0.25/ha).

4.1.1.4. Mineral Leases

Mineral leases are converted from mineral claims under the following circumstances:

- The value of the ore to be removed from the claim exceeds $100,000, unless the purpose of removal is for assay and testing;
- Representation work has reached a total value of $10/acre ($24.71/ha);
- A legal boundary survey of the claim has been recorded;
- The right to the claim(s) to be leased is not under dispute.

A lease has a 21-year term and can be renewed for a further 21 years. There is currently an annual rent levied of $1/acre ($2.47/ha) for the first 21-year term, and $2/acre ($4.94/ha) for subsequent renewal periods. The rent payable can be reduced by 50% on filing representation work.

A Mining Lease is required to bring a property into commercial production.

4.1.1.5. Legislative Changes

Under current legislation, the application for conversion from a mineral claim to a mineral lease must be made before the 9th anniversary of the grant date, and there will be a one year extension period for preparing and filing the required boundary survey. Mineral claim sizes have been amended such that the maximum mining claim size is 1,250 hectares, and mineral claims will not be renewable after the 10-year anniversary.

Mineral claim and mineral lease payment obligations have been transitioned to the metric system and will be payable on hectares rather than the current acreage payment requirements.

4.1.2 Surface Rights

Public lands are lands owned by the Federal or Provincial Governments. Administration of public lands, including minerals for the Northwest Territories and Nunavut, is based on the Territorial Lands Act and its regulations. The Regulations under the Territorial Lands Act that deal with mineral tenure, leasing and royalties are the Northwest Territories and Nunavut Mining Regulations, formerly known as the Canada Mining Regulations Under the current Northwest Territories and Nunavut Mining Regulations, a party may prospect for minerals and stake mineral claims on any public lands covered under the Territorial Lands Act.

A surface lease is required under the Territorial Lands Act if a project will require the use of public land anywhere in the Northwest Territories for longer than two years.

4.1.3 Royalties

All mines in the Northwest Territories that are located on Crown lands must pay royalties. Currently, royalties are calculated on the value of the output of the mine for each financial year, and equal the lesser of:

- 13% of the value of output of the mine; or
- An amount calculated based on a sliding scale of royalty rates dependent upon the value of output of the mine, ranging from 5% for value of output between $10,000 and $5 million to 14% for value of output over $45 million.

4.1.4 Environmental Impact Assessment

There are two assessment and regulatory processes in the Northwest Territories: the Mackenzie Valley Resource Management Act (MVRMA) which applies to all regions of the Northwest Territories except the Inuvialuit Settlement Region, where the process set out in the Inuvialuit Final Agreement applies. The Ekati Project is regulated under the MVRMA.

As part of the MVRMA permitting process, land and water boards conduct a preliminary screening as the initial stage of Environmental Impact Assessment. Based on a public review, the land and water board determines whether or not a permit is issued at that time or if further environmental impact assessment is necessary through referral to the Mackenzie Valley Environmental Impact Review Board (MVEIRB). Both Boards and other select government agencies also have the authority for direct referral.

If an Environmental Assessment or Environmental Impact Review is deemed necessary, this is conducted by the MVEIRB and, when completed, the project returns to the land and water board for final regulatory permitting.

4.1.5 Taxation

Taxation assumptions used in the economic analysis are discussed in Section 22.

4.1.6 Fraser Institute Survey

Dominion has used the Investment Attractiveness Index from the 2015 Fraser Institute Annual Survey of Mining Companies report (the Fraser Institute survey) as a credible source for the assessment of the overall political risk facing an exploration or mining project in the Northwest Territories of Canada.

Dominion has relied on the Fraser Institute survey because it is globally regarded as an independent report-card style assessment to governments on how attractive their policies are from the point of view of an exploration manager or mining company, and forms a proxy for the assessment by industry of political risk in the Northwest Territories from the mining perspective.

The Fraser Institute annual survey is an attempt to assess how mineral endowments and public policy factors such as taxation and regulatory uncertainty affect exploration investment.

Overall, the Northwest Territories ranked 35 out of 109 jurisdictions in the survey in 2015.

4.2 Project Ownership

On November 13, 2012, Dominion Diamond Corporation and its wholly-owned subsidiary, Dominion Diamond Holdings Ltd. entered into share purchase agreements with BHP Billiton Canada Inc., and various affiliates to purchase all of BHP Billiton's diamond assets, including its controlling interest in the Ekati Diamond Mine as well as the associated diamond sorting and sales facilities in Yellowknife, Northwest Territories and Antwerp, Belgium.

On 9 July 2014, C. Fipke Holdings Ltd. sold its interests in the Core and Buffer Zones to the other joint venture participants. Section 4.3 describes the current ownership and joint venture percentage holdings.

4.3 Property Agreements

Information presented on the joint venture ownership percentages was current as at 31 July, 2016.

4.3.1 Core Zone Joint Venture

A group of 175 mining leases, totalling 172,992 ha forms the Core Zone Joint Venture. The parties to the joint venture, and their respective interests, are:

- Dominion Diamond Holdings Ltd. through its wholly-owned subsidiary Dominion Diamond Ekati Corporation 88.9%;
- Dr. Stewart L. Blusson 11.1%.

The Core Zone Joint Venture operates under the Northwest Territories Diamonds Joint Venture Agreement – Core Zone Property dated 17 April 1997.

4.3.2 Buffer Zone Joint Venture

The Buffer Zone Joint Venture contains 106 mining leases covering 89,184 ha. The parties to the joint venture, and their respective interests, as at the Report effective date, are:

- Dominion Diamond Holdings Ltd. through its wholly-owned subsidiary Dominion Diamond Ekati Corporation 65.3%;
- Archon Minerals Ltd (Archon) 34.7%.

The Buffer Zone Joint Venture is operated through the Northwest Territories Diamonds Joint Venture Agreement – Buffer Zone Property dated 17 April 1997.

Archon's interest in the Buffer Zone Joint Venture is held by Archon and a related company; however, the parties to the Buffer Zone Joint Venture have agreed that Archon and the related company are to be treated as one party for the purposes of the Buffer Zone Joint Venture.

In January 2016, the management committee of the Buffer Zone approved a program and budget for the Buffer Zone for fiscal year 2017. In March 2016, Archon provided notice to DDEC, as operator of the Buffer Zone, of its objection to certain elements of the fiscal 2017 program and budget, and indicated that it was only prepared to contribute to certain portions of the program and budget. Dominion has elected to fund all of the cash calls for those elements of the fiscal 2017 program and budget that will not be funded by Archon. Archon has asserted that its objection to the fiscal 2017 program and budget was based on its position that certain proposed expenditures in the fiscal 2017 program and budget were in breach of the terms of the Buffer Zone Joint Venture agreement, and as such, the management committee of the Buffer Zone was not permitted to approve those aspects of the fiscal 2017 program and budget. Accordingly, Archon has disputed Dominion's dilution of Archon's participating interest in the Buffer Zone. A revised program and budget for fiscal year 2017 is expected to be presented to the management committee of the Buffer Zone in the third quarter of fiscal 2017 to incorporate changes to the mine plan impacting the Lynx project in the Buffer Zone. Dilution of Archon's participating interest in the Buffer Zone had been expected in the second quarter of fiscal 2017, but has been temporarily withheld until Archon re-confirms its intentions with respect to funding the revised program and budget.

4.3.3 Impact and Benefit Agreements

Impact and Benefit Agreements (IBAs) were concluded with the four aboriginal communities, Tlicho, Akaitcho Treaty 8, North Slave Métis, and the Inuit of Kugluktuk, who were impacted by the mine's operations prior to the commencement of mining.

The IBAs establish requirements for funding, training, preferential hiring, business opportunities, and communications. Although the terms of the IBAs are confidential, the responsible QPs consider the agreements to be similar to other agreements of this type that have been negotiated with Aboriginal groups in Canada. The agreements extend over the current life of mine.

4.4 Mineral Tenure

When the two joint venture agreements were concluded, the mineral tenure was larger than the current ground holdings, as a number of leases have since been relinquished.

The Ekati mining lease block currently comprises 281 mining leases that cover an area of approximately 262,176 ha. The Core JV includes 175 mining leases, totalling about 172,992 ha. The Buffer JV contains 106 mining leases (approximately 89,184 ha). Mineral tenure ownership details are as summarized in Section 4.3.1 and Section 4.3.2.

Lease data are summarized in Table 4-1 (Core Zone) and Table 4-2 (Buffer Zone). Appendix A contains a full lease list by lease number. Locations of the outlines of the mineral leases in each joint venture area are shown in Figure 4-1; Figure 4-2 shows the locations of the various kimberlite pipes with Mineral Resource estimates in relation to the Ekati Project boundaries.

All mining leases were legally surveyed by licensed surveyors.

Table 4-1: Core Zone Mineral Lease Summary Table

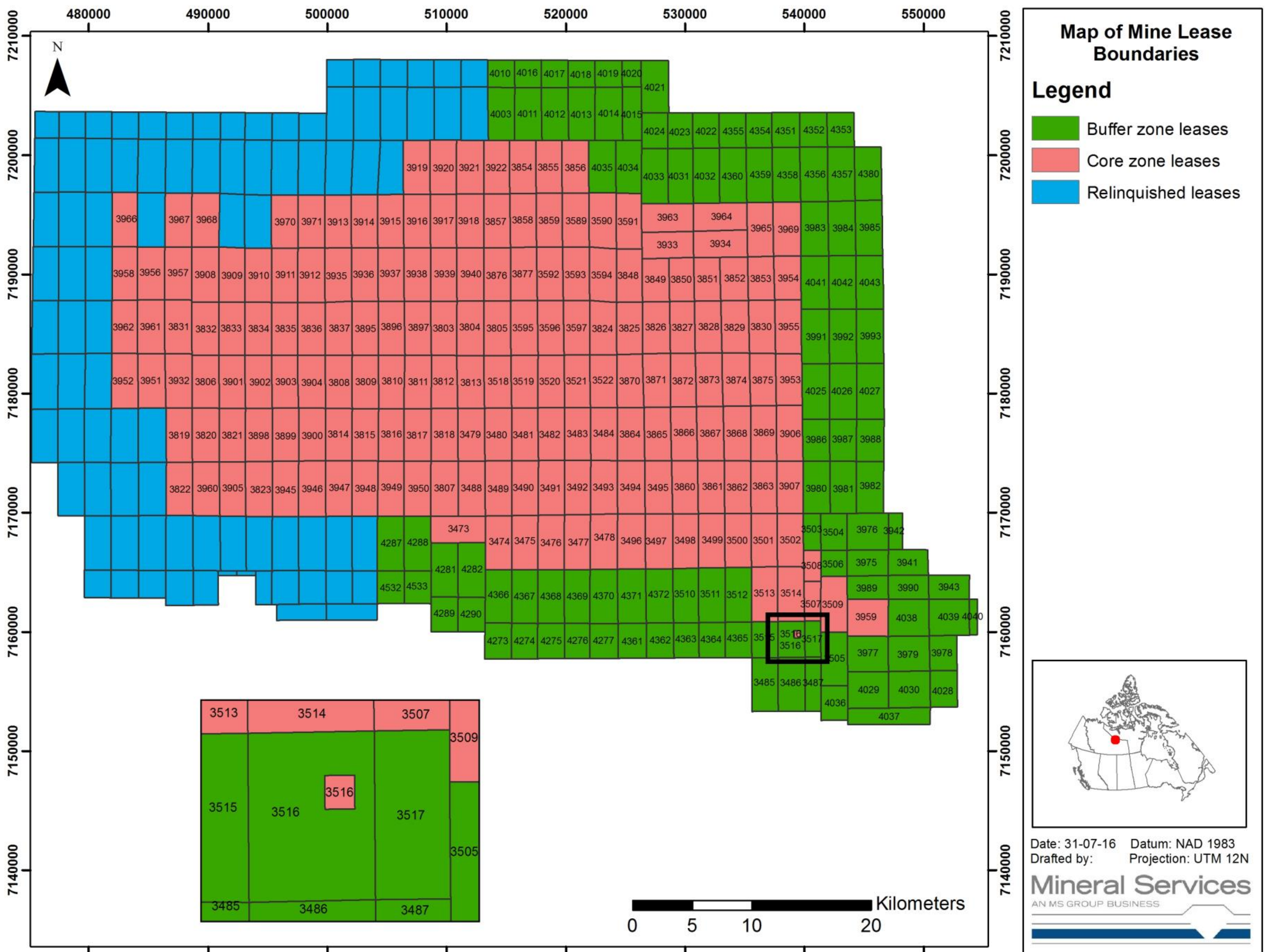
Lease Number	Owner Name	NTS Map Sheet Numbers	Issue Date	Expiry Date	Yearly Payment	Hectares
3473—3502	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09, 10	10-Apr-1996	10-Apr-2017	$66,729	27,004
3507—3509	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09	10-Apr-1996	10-Apr-2017	$4,266	1,726
3513—3514	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09	10-Apr-1996	10-Apr-2017	$4,949	2,003
3518—3522	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09, 10, 15, 16	10-Apr-1996	10-Apr-2017	$12,240	4,953
3589—3597	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 15, 16	26-Jun-1997	26-Jun-2018	$22,129	8,955
3803—3806	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 15, 16	5-Nov-1999	5-Nov-2020	$9,890	4,002
3807—3837	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 10, 11, 14, 15, 16	17-Nov-1999	17-Nov-2020	$75,991	30,753
3848	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 16	16-Aug-1999	16-Aug-2020	$2,578	1,043
3849—3856	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 15, 16	5-Nov-1999	5-Nov-2020	$17,269	6,989
3857—3877	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09, 10, 15, 16	17-Nov-1999	17-Nov-2020	$51,729	20,934
3895	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 15	2-Jun-2000	2-Jun-2021	$2,476	1,002
3896	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 15	17-Jul-2000	17-Jul-2021	$2,566	1,038
3897—3922	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09, 11, 14, 15	2-Jun-2000	2-Jun-2021	$63,921	25,868
3932—3940	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 11, 14, 15, 16	2-Jun-2000	2-Jun-2021	$22,433	9,079
3945—3971	Dominion Diamond Ekati Corporation (88.9%); and Dr. Stewart L. Blusson (11.1%)	076D 09, 10, 11, 14, 16	2-Jun-2000	2-Jun-2021	$68,307	27,643
Total Hectares						***172,992***

Table 4-2: Buffer Zone Mineral Lease Summary Table

Lease Number	Owner Name	NTS Map Sheet Numbers	Issue Date	Expiry Date	Yearly Payment	Hectares
3486—3487	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	10-Apr-1996	10-Apr-2017	$6,469	2,618
3503—3506	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	10-Apr-1996	10-Apr-2017	$6,483	2,624
3519—3512	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	10-Apr-1996	10-Apr-2017	$7,754	3,138
3515—3517	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	10-Apr-1996	10-Apr-2017	$4,227	1,743
3541—3943	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	27-Jul-2001	27-Jul-2022	$4,568	1,849
3975—3976	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	27-Jul-2001	27-Jul-2022	$4,439	1,797
3977—3978	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	1-Nov-2001	1-Nov-2022	$4,308	1,743
3979	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	27-Jul-2001	27-Jul-2022	$2,414	977
3980	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	1-Nov-2001	1-Nov-2022	$2,442	988
3981—3984	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09, 16	27-Jul-2001	27-Jul-2022	$10,124	4,097
3985	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09	1-Nov-2001	1-Nov-2022	$2,574	1,042
3986—3990	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	27-Jul-2001	27-Jul-2022	$9,178	3,714
3991—3993	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 16	1-Nov-2001	1-Nov-2022	$7,657	3,099
4003	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 15	1-Nov-2001	1-Nov-2022	$2,522	1,021
4010—4027	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09, 15, 16	1-Nov-2001	1-Nov-2022	$34,108	13,803
4028—4031	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09, 16	27-Jul-2001	27-Jul-2022	$9,511	3,849
4032—4035	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 15, 16	1-Nov-2001	1-Nov-2022	$9,717	3,932
4036—4039	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12; 076D 09	27-Jul-2001	27-Jul-2022	$9,805	3,968
4040—4043	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076C 12, 076D 12	1-Nov-2001	1-Nov-2022	$8,113	3,283
4273—4277	Dominion Diamond Ekati Corporation (65.3%),	076D 09, 10	16-Nov-2001	16-Nov-2022	$8,084	3,272

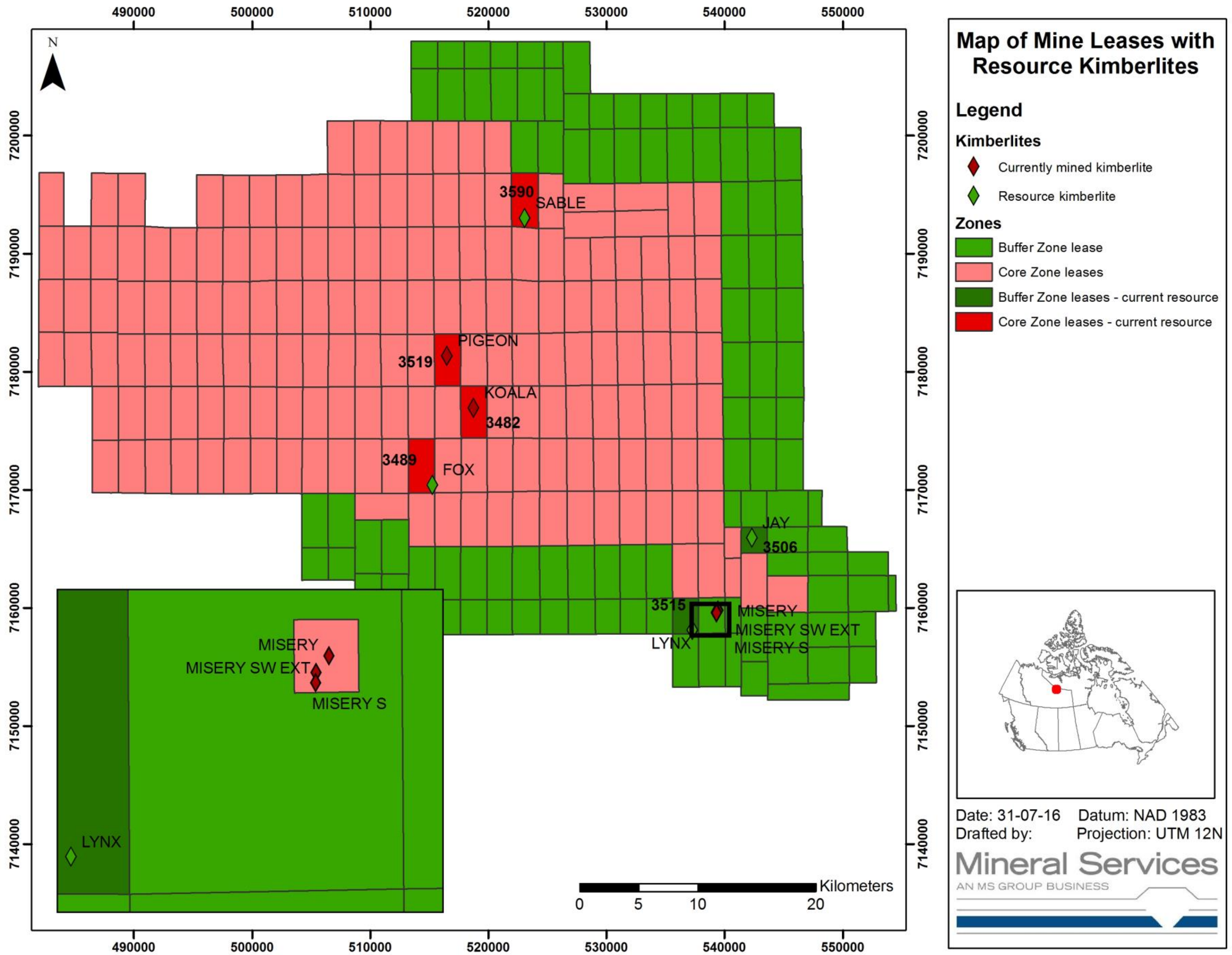
	and Archon Minerals Ltd. (34.7%)					
4281—4282	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 10	16-Nov-2001	16-Nov-2022	$5,128	2,075
4287—4290	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 10	16-Nov-2001	16-Nov-2022	$8,368	3,386
4351—4372	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 09, 10, 16	16-Nov-2001	16-Nov-2022	$46,707	18,902
4380	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076D 16	16-Nov-2001	16-Nov-2022	$ 2,465	997
4532—4533	Dominion Diamond Ekati Corporation (65.3%), and Archon Minerals Ltd. (34.7%)	076 D10	16-Nov-2001	16-Nov-2022	$ 3,131	1,267
Total Hectares						***89,18**4*

Figure 4-1: Mineral Tenure Map



Note: Within the context of the joint venture agreements, that portion of licence 3516 which hosts the Misery deposit (refer to inset figure), is considered to be part of the Core Zone.

Figure 4-2: Mineral Tenure Map showing Kimberlite Locations by Lease



Note: Within the context of the joint venture agreements, that portion of licence 3516 which hosts the Misery deposit (refer to inset figure), is considered to be part of the Core Zone.

Annual lease payments to the Northwest Territories comprise $1.00 per acre for the duration of the 21-year lease period. Payments increase to $2.00 per acre if a second 21-year term is granted after application to the Northwest Territories for the extension. All payments were up to date as at the Report effective date.

4.5 Surface Rights

Within the Ekati mineral leases, there are 10 surface leases, which provide tenure for operational infrastructure. All mine project developments are within these surface leases. Dominion also holds eight Type A land use permits (Sable Road, Sable Pit and associated activities, and Pigeon Pit and associated activities, Misery power line, Lynx open pit, Lynx Waste Rock Storage Area, exploration activities throughout the claim block, and the Jay Early Works and associated activities).

Additional information on the surface leases is provided in Section 20.

4.6 Water Rights

Water rights and water licences for the Ekati Project are discussed in Section 20.

4.7 Royalties and Encumbrances

4.7.1 Mining Tax

The current royalty payable to the Government of Northwest Territories is discussed in Section 4.1.3.

4.7.2 Misery Royalty

A royalty was payable to the Core Zone Joint Venture on kimberlite tonnes mined and processed from Misery Main, Misery South, and Misery Southwest Extension. The royalty has been fully discharged and no longer applies.

4.8 Permits

An exploration land use permit is required to conduct exploration activities on the mining leases outside of the areas covered by the Federal surface leases or other land use permits. The previous exploration land use permit was allowed, by the previous mine operator, to expire in October 2009. A new exploration land use permit was requested by Dominion and received in the fall of 2013.

Permit requirements in support of mining operations are discussed in Section 20.

4.9 Environmental Liabilities

Current environmental liabilities comprise those to be expected of an active mining operation that is exploiting a number of kimberlite pipes, and includes open pits, processing plant, infrastructure buildings, water retention dams and dikes, waste rock storage facilities, and access roads.

The environmental permitting and closure plan is discussed in more detail in Section 20.

4.10 Native Title

The Ekati mineral tenure lies within a land area that is claimed by both the Dogrib (Tlicho Nation) and the Akaitcho Treaty 8.

The Tlicho Nation land claim has been settled with the Federal Government and the settlement had no material impact on the mining operations at Ekati.

The Akaitcho Treaty 8 land claim is still to be resolved.

The Tlicho and Akaitcho Treaty 8 have executed an agreement of cooperative management for the lands covered by the Ekati Project area.

The North Slave Metis and Inuit also exercised traditional use of the region.

4.11 Social License

Information on the mine’s social licence to operate is presented in Section 20.

4.12 Comments on Property Description and Location

In the opinion of the responsible QPs, the information discussed in this section supports the estimation of Mineral Resources and Mineral Reserves, based on the following:

- Information provided by Dominion supports that the mining tenure held is valid and is sufficient to support estimation of Mineral Resources and Mineral Reserves;
- Dominion holds sufficient surface rights in the Ekati Project area to support the mining operations, including access and power line;
- Royalties are payable on production to the Government;
- Dominion holds the appropriate permits under local, Territorial and Federal laws to allow mining operations;

- The appropriate environmental permits have been granted for Ekati Diamond Mine operation (refer to Section 20);
- At the effective date of this Report, environmental liabilities are limited to those that would be expected to be associated with an operating diamond mine with production from several kimberlite pipes (refer to Section 20);
- Dominion is not aware of any significant environmental, social or permitting issues that would prevent continued exploitation of the deposit; however, future renewals of surface leases will require engagement with Aboriginal groups;
- To the extent known, there are no other significant factors and risks known to Dominion that may affect access, title, or the right or ability to perform work on the property.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1 Accessibility

Road access to the Ekati Diamond Mine is by a winter ice road that is seasonal in nature. The ice road is 475 km long, is constructed largely (86%) across lakes, and connects from the permanent all-weather road east of Yellowknife to the main Ekati complex via the Misery haulage road. Typically the road is open 8–10 weeks a year, from mid-January to late March.

The ice road is built each year and is a joint venture between the Ekati, Diavik and Gahcho Kué mines. All heavy freight except emergency freight is transported to the site by truck over the ice road. See also the discussion in Section 18.1 on the ice road.

The Ekati Project has an all-season runway and airport facilities suitable to accommodate large airplanes such as the Hercules C-140 and Boeing 737 jets. Air transport is used year round for transport of all personnel to and from the site as well as light or perishable supplies, and, as required, emergency freight (see also discussion in Section 18.1).

5.2 Climate

This area is within the Canadian sub-arctic; cold winter conditions predominate for the majority of the year, with approximately three months when day-time temperatures are consistently above freezing.

The mean annual temperature at the mine site is -10° C. The warmest average monthly temperature is 12° C in July. The coldest average monthly temperature is -28°C in January, although extremes have reached below -50° C. The site is generally windy with velocities averaging 20 km/hr on typical days and the 100 year extreme exceeding 90 km/hr. Precipitation annual average is 345 mm, and consists of relatively equal amounts of rain and snow. Available daylight ranges from a minimum of four hours per day in December to a maximum of 22 hours in June.

The mine operates 24 hours per day year-round, except during white-out conditions.

5.3 Local Resources and Infrastructure

Infrastructure supporting the Ekati Project is discussed in Section 18.

The closest community to Ekati is Wekweètì, located 180 km to the southwest. Yellowknife, the capital city of the Northwest Territories, is 310 km to the southwest of the mine. The nearest large city to Yellowknife is Edmonton, located due south via an 18-hour drive or accessed by several daily flights offered by four commercial airlines.

5.4 Physiography, Vegetation and Fauna

The topography across the property is generally flat with local surface relief rising up to 20 m, and terrain elevation ranging up to 100 m in total relief over the region.

The most distinctive physical features of the landscape are eskers, sinuous ridges of granular material deposited by glaciers. Eskers are important as wildlife habitat and also as construction material sources.

Bedrock generally outcrops at surface over the mine area, or is partially overlain by a thin (up to 5 m thick) veneer of Quaternary sediments consisting mainly of silty gravel, sand and organic matter. The overburden is thicker in some areas due to esker occurrence.

The watersheds within the Ekati Project area drain into Lac de Gras, then to the Coppermine River, which flows north westerly to the Arctic Ocean near the community of Kugluktuk. There are more than 8,000 lakes within the 266,300 hectare claim block.

Approximately one-third of the Ekati Project area is covered by typically oligotrophic[1] water bodies. The low terrain has resulted in a diffuse drainage pattern, and streams typically meander in braided channels through extensive boulder fields between lakes and ponds. High flows are recorded during spring run-off, while low flows or intermittent stream channels are typical in late summer.

The site is within the continuous permafrost zone. In this area, the layer of permanently frozen subsoil and rock is generally 300 m deep and overlain by a 1–3 m active layer that thaws during summer. Talik (unfrozen) zones occur beneath water bodies and, depending on the thermal storage capacity of the lake, may fully penetrate the permafrost horizon.

The terrestrial vegetation community is composed of species adapted to freezing temperatures, low nutrients and localized areas of drought and standing water. The short growing season, cool soil temperatures, and lack of soil development limit the establishment of productive, diverse plant communities. The most common vegetation communities are mats of low shrubs, including dwarf birch, Labrador tea, crowberry and bearberry. Lichen communities are found in areas with very thin layers of soil.

[1] a body of water which is poor in dissolved nutrients and usually rich in dissolved oxygen.

Taller shrubs such as willows and scrub birch are found in sheltered areas such as ravines and along streams where there are depressions in the depth of the permafrost. The vegetation surrounding lakes and streams is dominated by lichen-covered boulders interspersed with depressions containing dense, spongy peat mats of moss and lichen.

The Ekati Project area is predominately wildlife habitat, with human use for hunting and fishing. The Bathurst caribou herd migrates through the area to access spring calving and winter forage grounds. Grizzly bears, wolves, foxes, wolverines and small mammals are also present at various times of the year. Most bird species are only summer residents but include loons, sandpipers, passerines and a few raptor species. Ravens and snowy owls are present year-round. The lakes support predominantly lake trout, round whitefish, slimy sculpin, ninespine stickleback, cisco, longnose sucker and Arctic grayling.

5.5 Comments on Accessibility, Climate, Local Resources, Infrastructure, and Physiography

In the opinion of the responsible QPs:

- There is sufficient suitable land available within the mineral tenure held by Dominion for processed kimberlite disposal, mine waste disposal, and installations such as the process plant and related mine infrastructure. All necessary infrastructure has been built on site to support the existing operations at Koala, Pigeon, Misery, and Lynx. Additional infrastructure is planned for the Sable and Jay projects;
- A review of the existing power and water sources, manpower availability, and transport options (refer also to Section 18) indicate that there are reasonable expectations that sufficient labour and infrastructure will continue to be available to support estimation of Mineral Resources, Mineral Reserves, and the mine plan based on the Mineral Reserves.

6.0 HISTORY

The discovery of kimberlites in the Lac de Gras region was the result of systematic heavy mineral sampling over a ten year period by prospectors Dr. Charles E. Fipke and Dr. Stewart Blusson. By late 1989, Dia Met Minerals Ltd. (Dia Met) was funding the programs and began staking mineral claims in the region. After making significant indicator mineral finds in the area, Dia Met approached BHP as a potential partner. The Core Zone Joint Venture agreement between BHP, Dia Met, Charles Fipke and Stewart Blusson was subsequently signed in August 1990. Dia Met was acquired by BHP in 2001.

The first diamond-bearing kimberlite pipe on the property was discovered by drilling in 1991. An Addendum to the Core Zone Joint Venture in October 1991 gave BHP the right to acquire additional mineral claims within 22,500 feet of the exterior boundaries of the then property area. The claims acquired as a result became the Buffer Zone Joint Venture claims.

To date, exploration activities have included till sampling, airborne and ground geophysical surveys, and drill programs. Approximately 350 geophysical and/or indicator dispersion targets were drilled, with a total of 150 kimberlites discovered on the Core Zone and Buffer Zone properties. The kimberlites were prioritized using microdiamond and indicator mineral chemistry. Forty kimberlite occurrences were subsequently tested for diamond content using reverse circulation (RC) drilling and/or surface bulk samples. Significant macrodiamond results were obtained on 17 pipes. There has been no exploration of the Ekati Project area for new kimberlites since 2007.

Baseline environmental data were collected throughout the NWT Diamonds Project area (as the Ekati Project was then known) from 1993 to 1996. In 1995, BHP Billiton submitted its Environmental Impact Statement (EIS) for the NWT Diamonds Project to the Federally-appointed Environmental Assessment Review Panel. After a comprehensive review, the Government of Canada approved the development of the NWT Diamonds Project in November 1996.

In 1998, the Project was renamed Ekati Diamond Mine after the Tlicho word meaning “fat lake”. Construction of the mine began in 1997, open pit mining operations commenced in August 1998, and the Ekati Diamond Mine officially opened on October 14, 1998.

As at 31 July 2016, the mining status includes:

- Open pit mining operations commenced in August 1998 at the Panda pipe, and continued through June 2003. Underground production from the Panda pipe began in June 2005 and completed in 2010. The Panda kimberlite pipe is fully depleted;
- The Misery open pit operation commenced in 2002 and was completed in 2006. Production from the Misery stockpiles continued to 2007. Pre-stripping at Misery for a pushback pit commenced in 2011 and ore release was achieved in early 2016. The operation is currently active;
- The Koala open pit operation commenced in 2003 and was completed in 2007. Underground production from the Koala pipe began in June 2007 and the operation is currently active;
- The Koala North underground trial mine was operated from 2003 to 2004. Commercial underground mining at Koala North began in 2010 and completed in 2015. The Koala North kimberlite pipe is fully depleted;
- The Beartooth open pit operation commenced in 2004 and was completed in 2008. The Beartooth kimberlite pipe is depleted and the open pit is being used for fine processed kimberlite deposition;
- The Fox open pit operation commenced in 2005 and was completed in 2014;
- The Pigeon open pit operation commenced in 2015 and ore release was achieved in late 2015;
- Pre-stripping for the Lynx open pit commenced in late 2015;
- Mining has been suspended for a planned approximately three month period at Pigeon and Lynx only (July–September 2016) while the process plant undergoes remediation.

In early 2016, a major milestone was reached when Ekati achieved production of 60 million carats of diamonds. Table 6-1 summarizes the Ekati Project production history from the mine opening in October 1998 to 31 July, 2016.

Table 6-1: Production History

Fiscal Year	Metric Tonnes Processed (x 1,000)	Carats Recovered (x 1,000)	Grade (carats per tonne)
1999	1,565	1,230	0.79
2000	3,377	2,777	0.82
2001	3,199	2,800	0.88
2002	3,354	4,562	1.36
2003	4,310	5,424	1.26
2004	4,446	6,853	1.54
2005	4,595	4,522	0.98
2006	4,297	3,197	0.74
2007	4,539	4,030	0.89
2008	4,411	4,188	0.95
2009	4,762	4,026	0.85
2010	4,895	3,811	0.78
2011	4,692	3,133	0.67
2012	4,482	2,231	0.50
2013	3,079	1,216	0.40
2014	3,381	1,677	0.49
2015	4,131	3,158	0.76
2016	3,618	3,732	0.97
1H2017	1,573	1,932	1.23
Total	***69,088***	***60,767***	***0.88***

Notes to Accompany Production History Table:

1. Fiscal year 1999: from 1 June, 1998 to 31 May, 1999.
2. Fiscal year 2000: from 1 June, 1999 to 30 June, 2000 (13 months).
3. Fiscal year 2001 to fiscal year 2012: from 1 July to 30 June to reflect BHP Billiton's fiscal year.
4. Fiscal year 2013: reflects the period from 1 July, 2012 to 9 April, 2013.
5. Fiscal year 2014 (partial year): reflects period from 10 April, 2013 (Ekati transaction) to 31 January, 2014.
6. Fiscal year 2015: reflects the period from 1 February, 2014 to 31 January, 2015.
7. Fiscal year 2016: reflects the period from 1 February, 2015 to 31 January, 2016.
8. 1H Fiscal year 2017: reflects the period from 1 February, 2016 to 31 July, 2016.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

This regional geological context was sourced from Nowicki et al., (2003).

The Ekati Project area is underlain by the Slave Structural Province, one of several Archean cratons, which together constitute the nucleus around which the North American continent evolved. The Slave Province is a granite–greenstone terrane that grew by tectonic accretion around a pre-3 Ga nucleus that is preserved in the central and western parts of the province, with a Neoarchean juvenile arc in the east.

Rock types within the Slave Province can be assigned to three broad lithostratigraphic groups: metasedimentary schists, migmatites, and various syn- and post-tectonic intrusive complexes.

The metasediments represent a metamorphosed greywacke sequence and are widespread in the central and southern portions of the Ekati Project area. Typically the metasediments are fine-grained with a high proportion of sheet silicates and generally foliated. Sulphide minerals are present at trace concentrations but occasionally at concentrations of up to 2% at centimetre scale. Locally, up to 5% sulphides are observed on a centimetre scale.

The metasediments are intruded by voluminous neo-Archean granitoids. Syntectonic (ca. 2.64 to 2.60 Ga) tonalites and granodiorites occur predominantly in the central and northern portions of the property, while post-tectonic (ca. 2.59 to 2.58 Ga) granites (two-mica granite and biotite granite) form large plutons in the eastern and northeastern portions of the property. The granodiorites are generally white to grey in colour, medium to coarse-grained and weakly foliated to massive. Locally, the granodiorite contains rounded biotite-rich mafic xenoliths ranging from 10 to 150 mm in size and rare cubic pyrite grains (up to 2 mm). The granodiorite has an average modal composition of 40% quartz, 45% feldspar and 15% biotite. In weakly altered zones, 1 to 3% epidote may be present. The two-mica granite contains fine to coarse-grained quartz, potassium feldspar, and plagioclase, with 3–15% biotite and muscovite. Tourmaline laths up to 0.5 cm by 3.5 cm have been observed. Pegmatite phases are common. Sulphide minerals are rarely observed, and if present only in trace amounts.

The western part of the Ekati Project area is dominated by migmatites which reflect melting of metasediments due to widespread granite intrusion and associated heat input.

Dykes of five major Proterozoic diabase dyke swarms (ages varying from 2.23–1.27 Ga) intrude the Archean rocks. The dykes are a few centimetres to more than 30 m wide and classified as magnetic and non-magnetic. Generally, they are near vertical with sharp or fractured contacts of variable orientation. Magnetic dykes are very dark grey to black, fine-grained, and contain magnetite and traces of pyrite, chalcopyrite, with lesser amounts of pyrrhotite. Sulphide mineral concentrations of up to 2% are rarely observed but only over widths of a few centimetres. Non-magnetic dykes have very similar overall composition to magnetic dykes except that they lack abundant magnetite.

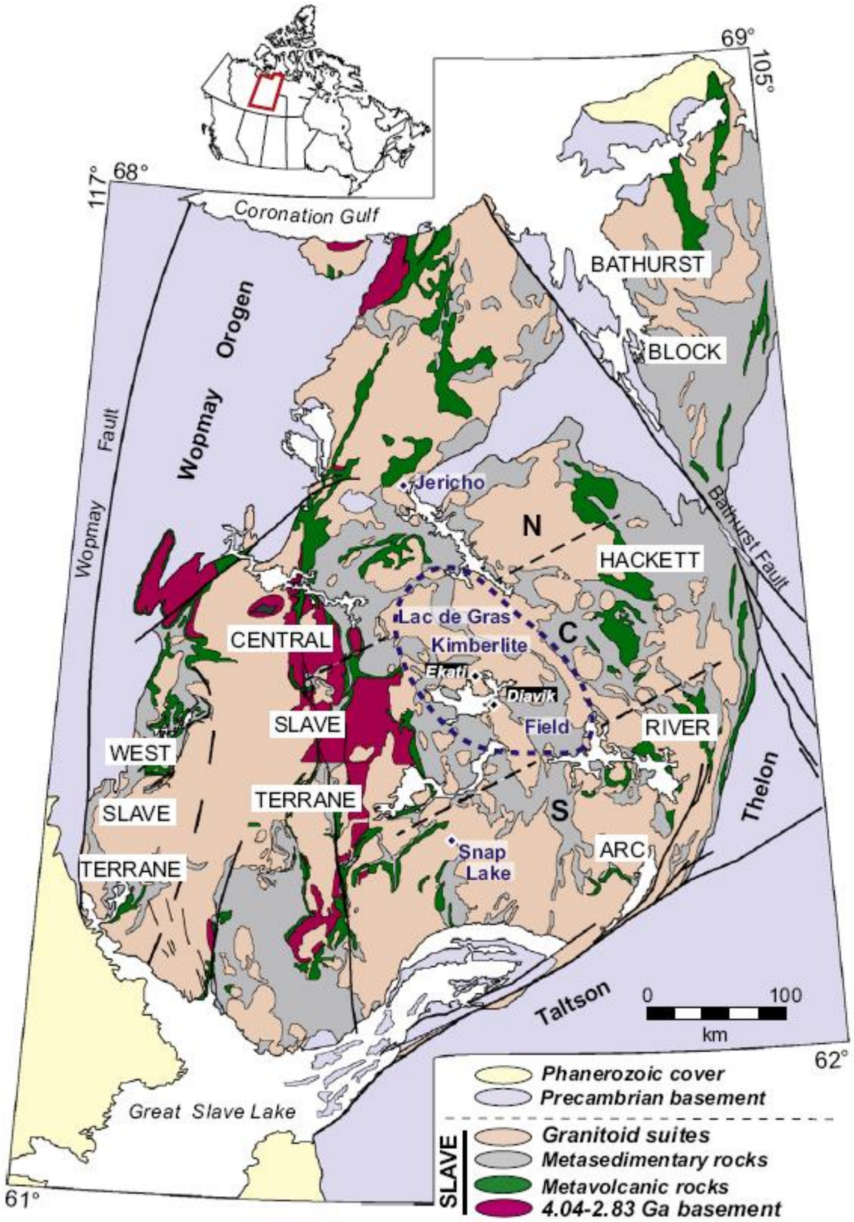
The kimberlite intrusions are of Phanerozoic age (i.e. younger than ~530 Ma). Erosion of the kimberlite pipes resulted in surface depressions, many of which became permanent, shallow lakes, which typically have several metres of silty sand sediments deposited on the lake bed.

The Wisconsinan Laurentide ice-sheet deposited glacial till, glaciofluvial eskers and related kames in the Lac de Gras area. Three glacial transport directions have been recognised: early transport to the southwest, followed by transport to the west, and finally by flow to the northwest.

Bedrock generally crops out at surface across the Ekati Project area, or is partially overlain by a thin (as much as 5 m thick) veneer of Quaternary sediments. Based on geomorphology work, these sediments consist mainly of silty gravel, sands, and organic matter.

The location and generalised geology of the Lac de Gras area is shown in relation to the Slave Craton in Figure 7-1.

Figure 7-1: Regional Geology Map



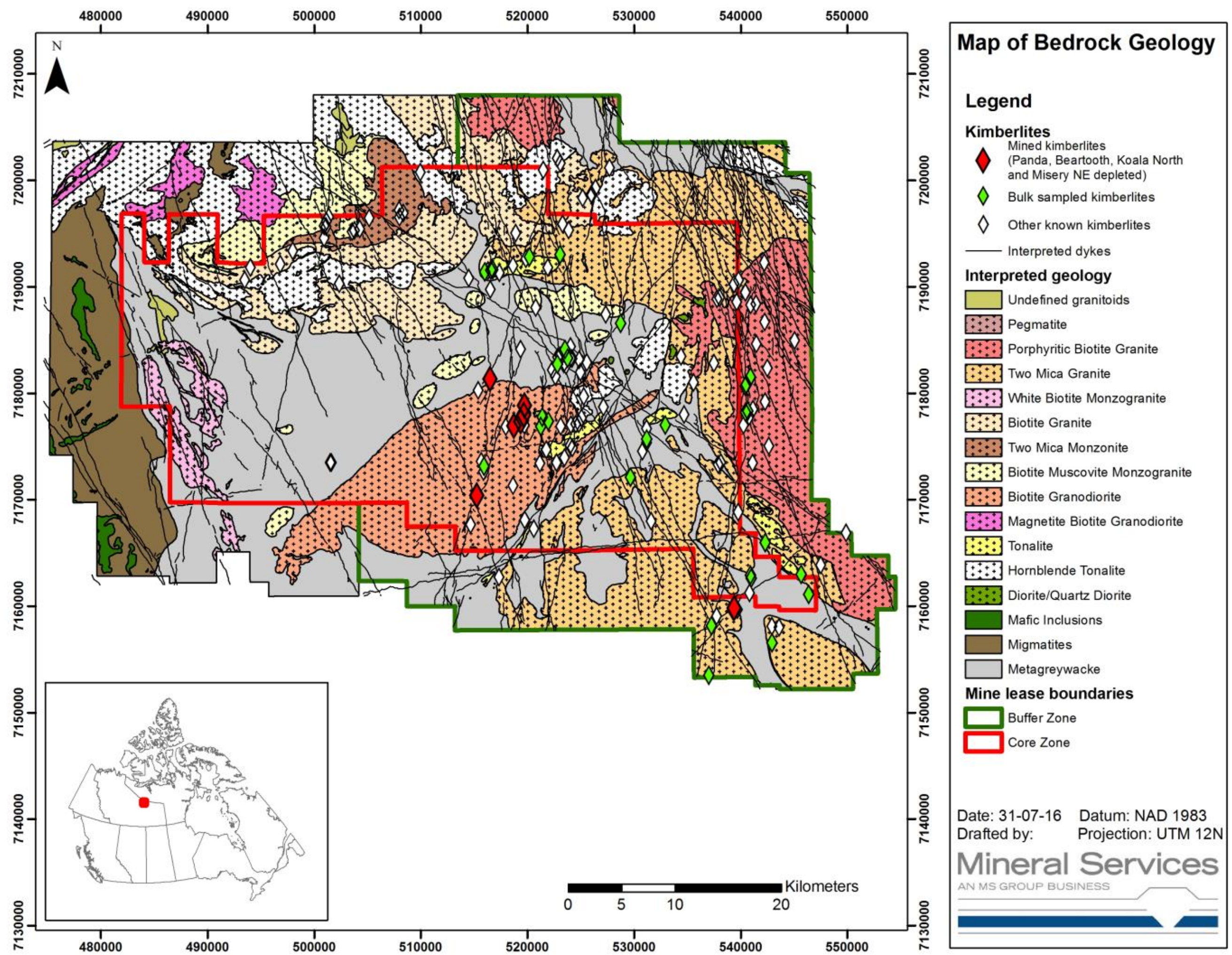
Note: Geologic map of the Slave craton in northwestern Canada (reproduced from Tappe et al., 2013; modified from Bleeker, 2003). The Ekati Diamond Mine is shown in relation to other producing and formerly producing mines in the region (Diavik and Snap Lake) as well as the outline of the Lac de Gras kimberlite field (dashed ellipse). The northeast–southwest-trending dashed lines delineate the northern, central, and southern lithospheric mantle domains as recognized from kimberlite- borne xenocrystic garnet compositions. The diamond symbols show the locations of currently active kimberlite-hosted diamond mines. Dominion holds interests in the Ekati and Diavik deposits. The remaining diamond occurrences are held by third parties and are not part of the Ekati Mine.

7.2 Project Geology

The following Project geology description is summarised from Nowicki et al., (2004).

The Ekati kimberlite pipes are part of the Lac de Gras kimberlite field which is located in the central Slave craton. The kimberlites intrude both granitoids and metasediments. They define several linear trends and are typically associated with dykes and lineaments. There is no dominant or unique structural association of the kimberlites. A bedrock geology map of the Ekati Project area is provided as Figure 7-2 and includes the locations of the known kimberlite occurrences.

Figure 7-2: Bedrock Geology Map



Fine-grained sediments have been preserved as xenoliths and disaggregated material in kimberlite which indicates that some sedimentary cover was present at the time of the kimberlite emplacement. None of this sedimentary cover has been preserved outside of the kimberlites.

The Ekati kimberlites range in age from 45 to 75 Ma. They are mostly small pipe-like bodies (surface areas are mostly <3 ha but can extend to as much as 20 ha) that typically extend to projected depths of 400–600 m below the current land surface. Kimberlite distribution is controlled by fault zones, fault intersections and dyke swarms.

Pipe infill has been broadly classified into six rock types:

- Magmatic kimberlite (MK) – hypabyssal;
- Tuffisitic kimberlite (TK);
- Primary volcaniclastic kimberlite (PVK);
- Olivine-rich volcaniclastic kimberlite (VK);
- Mud-rich, resedimented volcaniclastic kimberlite (RVK);
- Kimberlitic sediments.

With few exceptions, the kimberlites are made up almost exclusively of volcaniclastic VK, including very fine-grained to medium-grained kimberlitic sediments, RVK, and PVK. RVK represents pyroclastic material that has been transported (e.g. by gravitational slumping and flow processes) from its original location (likely on the crater rim) into the open pipe and has undergone varying degrees of reworking with the incorporation of surficial material (mudstone and plant material). In rare cases (e.g. Pigeon), pipes are dominated by or include significant proportions of MK.

While occasional peripheral kimberlite dykes are present, geological investigations undertaken to date do not provide any evidence for the presence of complex root zones or markedly flared crater zones.

Kimberlites at Ekati typically contain fragments of wood that was incorporated into the pipe during deposition. The wood fragments identified are related to the redwood Sequoia and Metasequoia genera, and are found relatively fresh and unmineralized. Fragments up to one metre size are common in Panda and Koala open pits, but the size and abundance decrease with depth.

Depending on the lithological unit, mud can make up a reasonable percentage of a given kimberlite unit. These xenoclasts range in size from millimetres to centimetres and are usually uniformly fine grained, dark grey to black in colour, and can have portions made up of kimberlitic minerals such as olivine and serpentine but with the majority consisting of smectite, quartz and pyrite;

Economic mineralization is mostly limited to olivine-rich resedimented volcaniclastic and primary volcaniclastic types. Approximately 10% of the 150 known kimberlite pipes in the Ekati Project are of economic interest or have exploration potential.

Diamond grades are highly variable. Estimated average grades for kimberlites that have been bulk sampled range from less than 0.05 cpt to more than 4 cpt.

7.3 Deposits

7.3.1 Koala

The Koala kimberlite pipe occurs near the central portion of the Ekati Project area. Koala is hosted in biotite granodiorite of the Koala Batholith. Open pit mining of the pipe was completed to optimal pit limits, and underground mining is in progress.

Mining and modelling work undertaken to date indicate that Koala has a roughly ovoid outline in plan view (approximately 5.7 ha, 380 m by 275 m) and a steep-sided inverted cone morphology that tapers inwards at 75º to 80º. Below 100 masl, the pipe morphology becomes increasingly complex, with significant pinching and swelling, ledges and overhangs. The shape and features of the Koala pipe are in many cases coincident with identified geologic structures such as faults. It is interpreted that the kimberlite exploited, or conversely, was constrained by, pre-existing geological structures in the granitic country rock into which it intruded.

The Koala pipe is occupied by a sub-horizontally layered sequence of distinctive kimberlite units. In contrast to the majority of the Ekati kimberlites, these units display well-defined contacts or transitions that, in most cases, can be correlated across the pipe, allowing construction of a three-dimensional model of the pipe's internal geology.

Seven major phases (geological domains) have been identified:

- Phase 1: a thick upper sequence of well graded material, the lower portion of which is dominated by coarse-grained, olivine-rich VK;
- Phase 2: a second smaller zone of graded kimberlite underlying Phase 1 in certain holes and suggesting the presence of more than one graded sequence;
- Phase 3: a considerably more mud-rich zone of intermixed mud-rich and olivine-rich RVK;

- Phase 4: a distinctive siltstone marker unit characterised by abundant wood fragments;
- Phase 5: a very thick mud-rich RVK unit with minor, gradational variations in olivine content divided into a monotonous largely granite-free thick upper zone (5A) and a basal zone characterised by the presence of abundant large granite blocks (5B);
- Phase 6: a major phase dominated by competent, relatively homogeneous, olivine- and juvenile lapillus-rich, probable PVK;
- Phase 7: a deep, volumetrically relatively minor phase characterized by the presence of significant amounts of MK, intermixed with lesser VK.

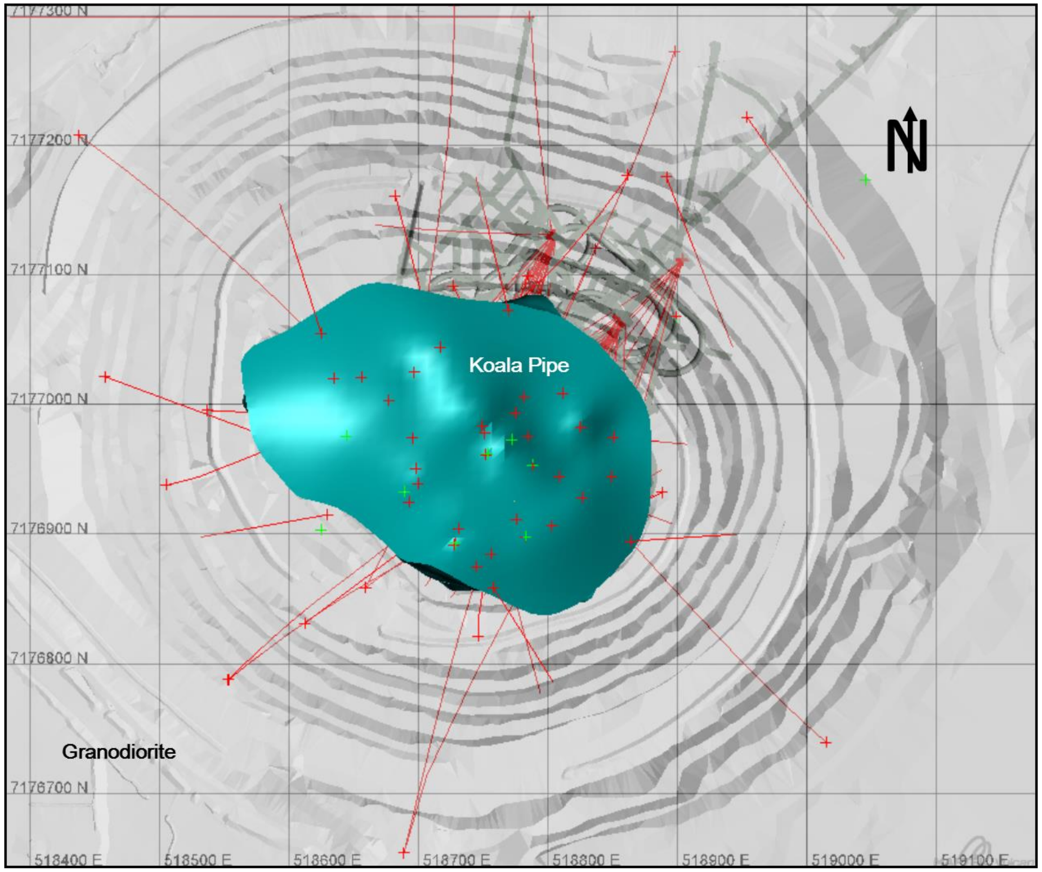
Phases 5 through 7 comprise the mineralization that is currently exploited by underground mining.

The emplacement history of the Koala kimberlite pipe is interpreted as follows:

- Explosive emplacement and eruption of kimberlite magma resulting in excavation of a crater and steep sided diatreme (to depths of greater than 650 m below surface) and simultaneous deposition of large amounts of volcanic tephra in a cone surrounding the crater;
- Partial filling of the lower diatreme during the waning stages of eruption by direct deposition of pyroclastic material to form Phase 6 PVK;
- Emplacement of magma, representing the final stage of intrusion, into partially-consolidated Phase 6 PVK in the lower portions of the diatreme to form Phase 7;
- Filling of the remainder of the pipe by episodic re-sedimentation of tephra previously deposited around the crater rim (together with varying amounts of variably consolidated sedimentary material that was present on the surface at the time of eruption) to form Phases 5, 4, 3, 2 and 1;
- Erosion of the land-surface post emplacement resulting in removal of surface sediments and the uppermost portions of the kimberlite deposit.

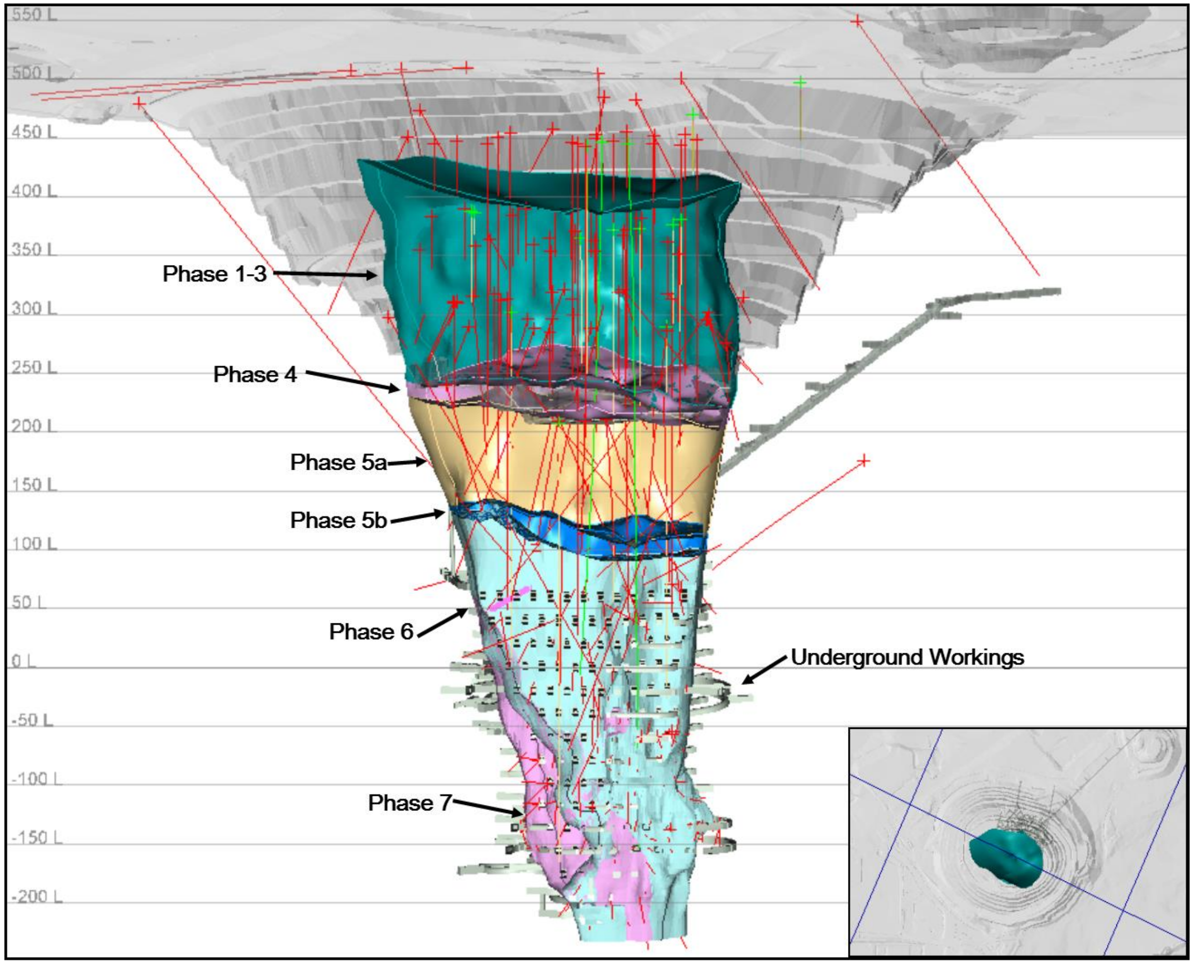
Figure 7-3 is a plan of the kimberlite. Figure 7-4 is an isometric view of the Koala pipe, illustrating the morphology of the deposit, internal geological phases, final open pit development, and drill hole data.

Figure 7-3: Surface Plan, Koala Pipe



Note: Figure prepared by Dominion, data are current to end July 2016. Kimberlite triangulations are of the geological model prior to mining. Final open pit outline is shown. Grey = pit design. Drill hole traces are coded by drill hole type: green = RC, red = core. Grid is as labelled (50 x 50 m).

Figure 7-4: Isometric Cross-Section, Koala Pipe



Note: Figure prepared by Dominion. Final pit bottom, underground workings, and drill holes are shown as at end July 2016. Grey = final pit outline. Drill hole traces are coded by drill hole type, green = RC, red = core. Elevation is as labelled (50 m spacing). Kimberlite phases are labelled as described in Section 7.3.1.

7.3.2 Koala North

The Koala North kimberlite pipe was a small body (approximately 0.5 ha surface area, 90 m by 50 m in surface diameter) situated directly between the Panda and Koala pipes. It is mined out.

7.3.3 Fox

The Fox kimberlite pipe covered an area of 17 ha at surface (500 m by 435 m) and is situated approximately 9 km southwest of the Koala pipe. The Fox pipe is hosted by granodiorite of the Koala Batholith. The Fox open pit has been mined out, but kimberlite mineralization extends at depth under the pit floor.

The Fox pipe consists of two major domains: the Crater and Diatreme domains, respectively. The approximate Crater/Diatreme geological boundary occurs at an elevation of 300 to 315 masl; the planned run-of-mine material is entirely contained within the Diatreme domain. Large rafted blocks of granite are entrained internally throughout the pipe.

The Crater domain is dominated by mud-rich RVK. This kimberlite is massively to crudely bedded, and contains variable amounts of fine- to medium-grained altered olivine macrocrysts and scattered small mudstone clasts set in a very fine-grained muddy to silty matrix. Large rafts of broken xenolithic material occur at the base of the crater domain.

The Fox Diatreme domain can be categorised into four main material types:

- Tuffisitic kimberlite breccia (TKB);
- Tuffisitic kimberlite (TK);
- Volcaniclastic kimberlite (VK);
- Granite or granite-rich zones.

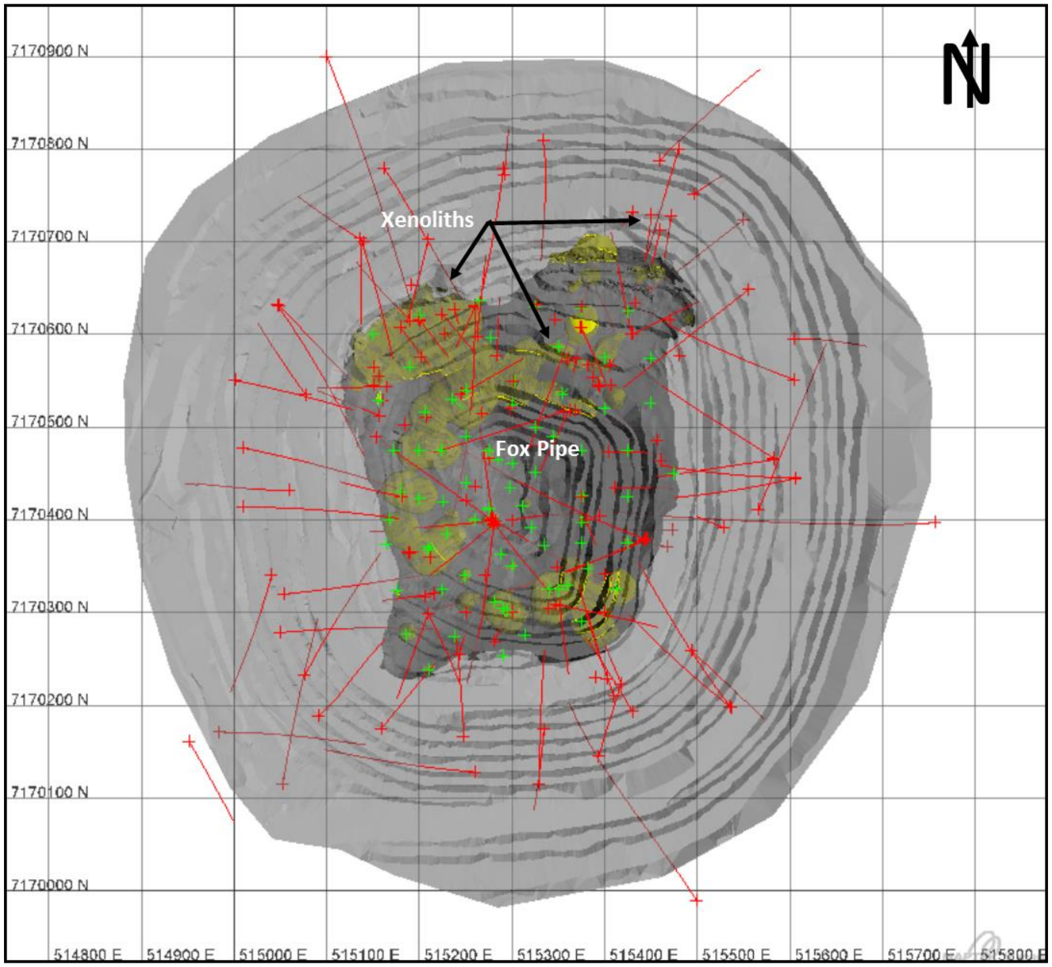
TKB is distinctly different from kimberlites in any of the other development pipes at Ekati. It is characterised by a massive texture, high in-situ granite content (mostly small, altered clasts), relatively high olivine content, and a matrix dominated by variably clay-altered serpentine (as opposed to the clastic silt/mud that dominates the VK and RVK varieties). Granite is highly fragmented and characteristically includes 30%, small (less than 1 cm) microxenoliths or xenocrysts of feldspar and biotite derived from disaggregation of the granite. All olivine is pervasively altered to serpentine. Several varieties of TKB have been identified:

- TK is texturally similar to TKB but is characterised by a relatively fine-grain size with respect to olivine, xenocrysts and xenoliths. Granite occurs mostly as fine (less than 1 cm) altered fragments with relatively minor, scattered larger xenoliths. Xenoliths exceeding 5 cm are rare. Clay content within TK appears to be intermediate between those in VK (high) and TKB (moderate);
- VK is a volumetrically small component mostly associated with the contact zones and granite breccia zones in the lower part of the open pit. VK is characterised by a dark silty to muddy, typically friable matrix with varying amounts of fine- to medium-grained altered olivine. Based on core logging and comparison with similar rock types of other Ekati kimberlite pipes, the clay content of VK is expected to be high. The xenolith content of VK is variable but generally low or very low. This is particularly true of xenoliths exceeding 5 cm, which are rare (on average 1 every 5 m in drill core) and xenoliths greater than 10 cm, which are extremely uncommon. Microxenoliths comprise approximately 15% of VK on average. In contrast with TK and TKB, small xenoliths (less than 5 cm) within VK are often not significantly altered. All larger xenoliths (greater than 5 cm) are fresh.

Internal granite occurs as evenly distributed small, commonly altered fragments within kimberlite (1 mm to 10 cm) and as large fresh xenolith blocks (20 cm to approximately 20 m in size). The latter are not evenly distributed and are concentrated primarily in a granite-dominated breccia zones occupying the lower portion of the open pit. They are also prevalent at the margins of the diatreme, close to the wall-rock contacts.

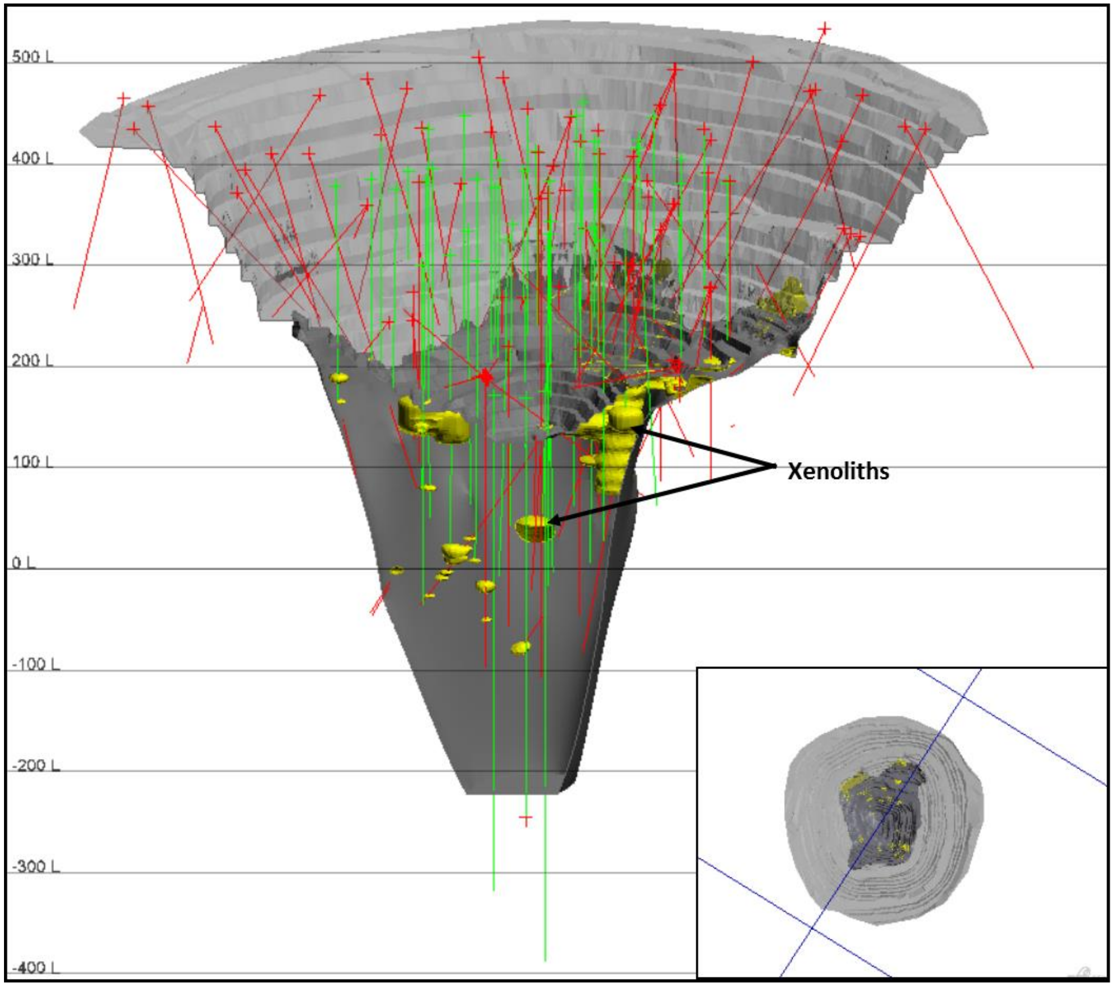
Modelling work undertaken to date indicates that the Fox pipe has a roughly square shape in plan view and a steep-sided inverted cone morphology that tapers inwards at 70^{o} to 75^{o}. Figure 7-5 is a plan view, and Figure 7-6 is an isometric view of the Fox kimberlite. The pipe flares to the northeast at 200 masl, resulting in a large embayment at this elevation.

Figure 7-5: Surface Plan, Fox Pipe



Note: Figure prepared by Dominion. Data are current as of end July, 2016. Data used are as at end of open pit mining operations. Colour key: dark grey = TK, yellow = xenoliths, light grey = pit outline as at end of pit life (May 2014). Drill hole traces are coded by drill hole type, green = RC, red = core. Grid is as labelled (100 x 100 m).

Figure 7-6: Isometric Cross-Section, Fox Pipe



Note: Figure prepared by Dominion. Data are current as of end July, 2016. Figure looks northwest (azimuth 302º) with a slight incline (-12º), inset picture shows section line. . Colour key: light grey = TK, yellow = xenoliths, dark grey = final pit outline (end May 2014). Elevation is as labelled (50 m spacing). Drill hole traces are coded by drill hole type, green = RC, red = core.

7.3.4 Misery

The Misery kimberlite complex is located in the southeastern portion of the Ekati main claim block, 30 km from the Ekati production plant and 7 km northeast of the Diavik diamond mine. Misery Main is the largest pipe in this cluster of six main known kimberlite bodies (Main pipe, South pipe, Southwest (SW) Extension, Southeast Complex, Northeast pipe and East dyke) and several small dykes and other intrusive bodies in the area.

The kimberlites are interpreted to have been emplaced at approximately 56 Ma at the contact between Archean biotite schist (meta-greywacke) and two-mica granite when the area was overlain by poorly consolidated mudstones, siltstones and shale. These rocks are found as xenoliths in varying abundances and relative proportions throughout the kimberlites; some of the kimberlites additionally comprise varying amounts of disaggregated mud as a matrix component. Resedimented volcaniclastic kimberlite (RVK) and magmatic kimberlite (MK) are the dominant textural varieties of kimberlite found in the complex; pyroclastic kimberlite (PK) is less common. Kimberlite–wall rock contacts are typically sharp and readily identified; the country rock surrounding the bodies is weakly brecciated or un-brecciated.

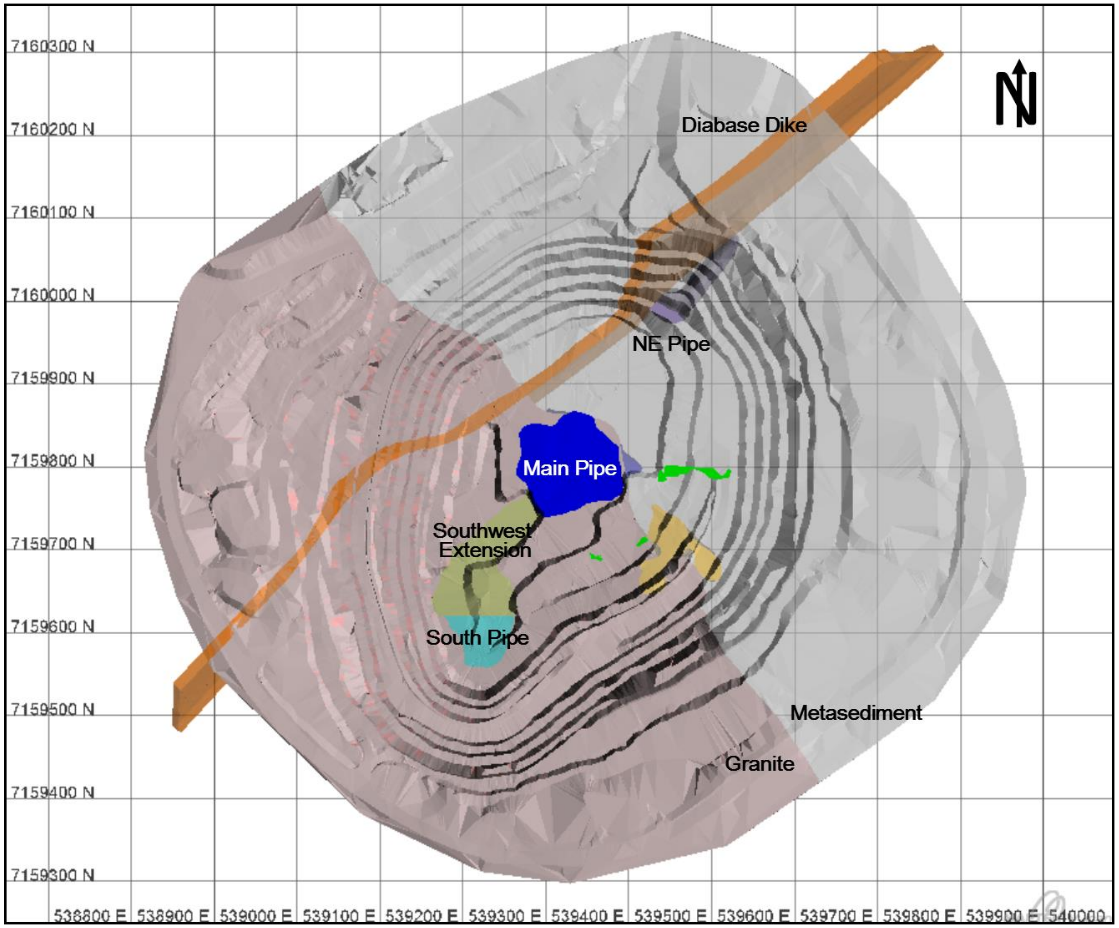
7.3.4.1. Misery Main

Misery Main is a small steep-sided pipe with a pre-mining surface expression of approximately 90 m by 175 m (1.5 ha). The pipe is infilled predominantly with RVK ranging from dark, mud-rich to coarse grained, very olivine-rich material. Variable amounts of carbonized wood, mudstone, siltstone, granite and biotite schist xenoliths, peridotitic and eclogitic garnet and altered peridotite xenoliths are present. In places, well defined, fine-scale bedding is evident, generally characterized by variations in the abundance and grain size of olivine. Bedding angles appear to be highly variable with both shallow and steeply dipping beds present. Minor fine-grained sedimentary material is also present.

Misery Main is characterised by varying proportions of coarse-grained olivine-rich RVK and fine-grained olivine-rich RVK. These rock types are irregularly distributed and are observed to be broadly correlated with grade and bulk density. Areas dominated by coarse-grained RVK generally show higher grade and bulk density than those areas that are dominated by fine-grained RVK, but contacts between these zones are gradational and no hard geological boundaries can be defined.

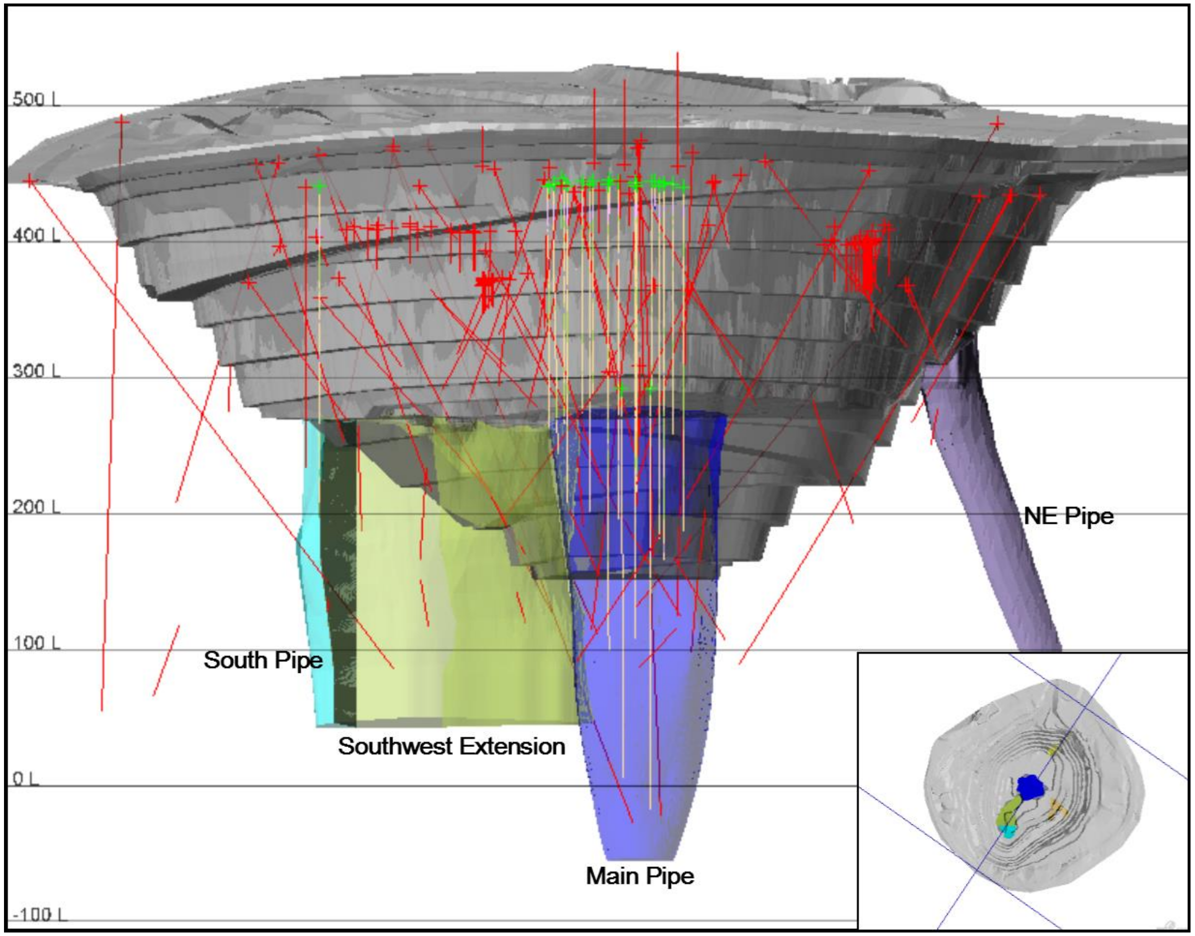
Figure 7-7 is a plan view, and Figure 7-8 is an isometric view of the Misery Main pipe and surrounding satellite bodies.

Figure 7-7: Surface Plan, Misery Pipe



Note: Figure prepared by Dominion. Data used are as at end July, 2016. Grid is as labelled (100 x 100 m). Green outline denotes the East Dyke kimberlite, and the light tan outline is the Misery Southeast kimberlite body.

Figure 7-8: Isometric Cross-Section, Misery Pipe



Note: Figure prepared by Dominion. Data are current as of end July, 2016. Section is looking northwest (296º) with a slight incline (-2º), inset picture shows section line. Red = Southwest Extension, blue = Main Pipe, green = South Pipe, dark grey = pit outline as of end January 2015, silver–grey = final pit design, drill hole traces are coded by drill hole type, green = RC, red = core. Elevation is as labelled (50 m spacing).

7.3.4.2. Misery South and Misery Southwest Extension

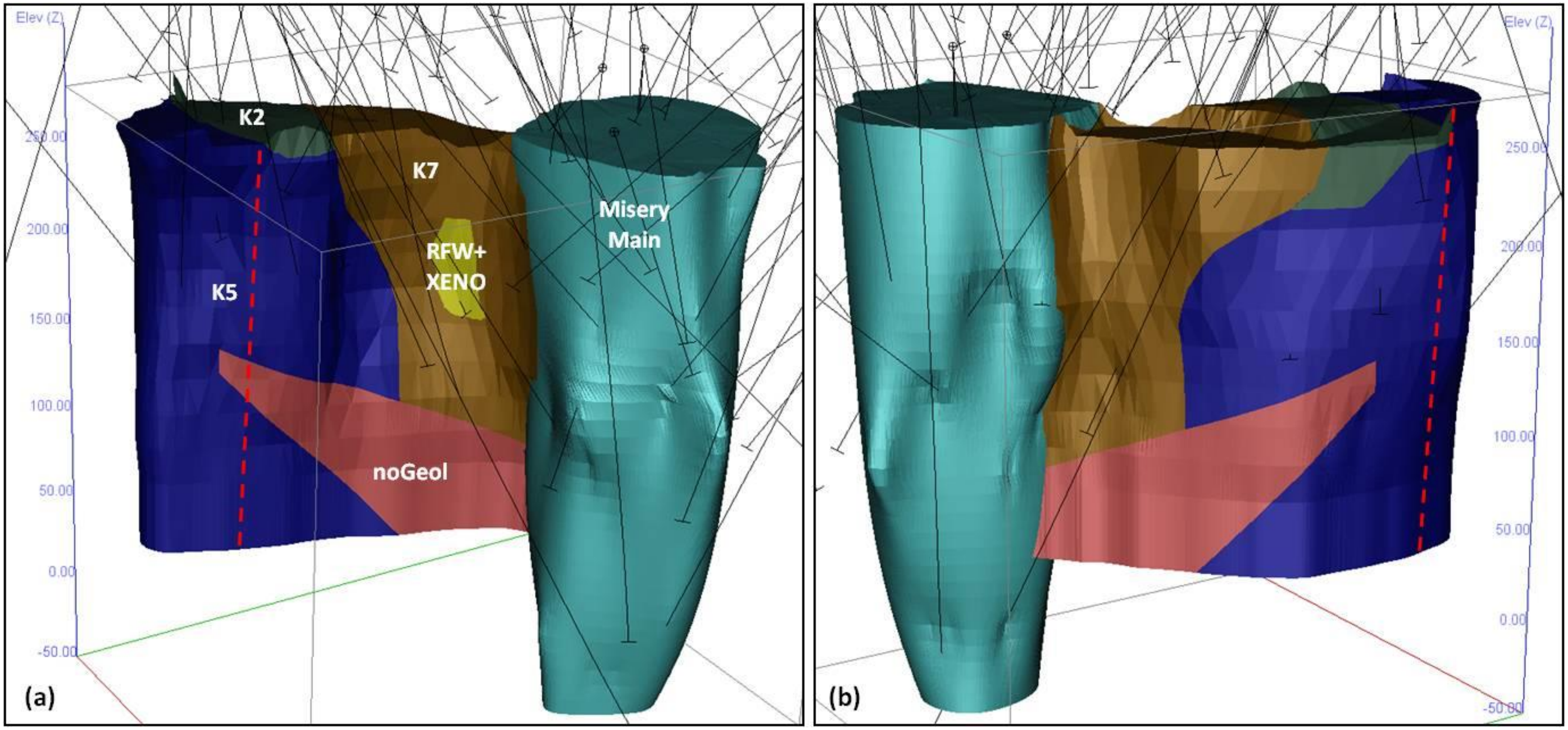
Mineral Services were retained to perform an updated Mineral Resource estimate for the Misery South and Misery Southwest Extension areas. Information from that work is summarized in this section.

Integration of new drilling information acquired in 2014 with existing data has resulted in revisions to previous model assumptions. The new data indicate that there is no support for a geological boundary between Misery South and Misery Southwest Extension. For the purposes of reporting Mineral Resources, however, a geographic boundary has been placed in the approximate location of the contact in the previous model and used to subdivide the internal geological domains. The boundary between the Misery Southwest Extension and the Misery Main pipe remains not well determined or understood. Figure 7-9 provides a section through the current model for Misery South and Misery Southwest Extension.

Due to the geological complexity observed in the Misery South and Misery Southwest Extension drill cores, the various kimberlite and country rock units have been composited into three geological domains for the purpose of three-dimensional modelling: domains K2, K5 and K7 constitute the main infill material within the Misery South and Misery Southwest Extension, and each consists mainly of kimberlite units KIMB2, KIMB5, and KIMB7, respectively.

KIMB2 is a dark brown, massive, very fine to fine grained variably mud- or olivine-rich RVK that is characterized by the variable presence of large sediment xenoliths of mainly grey–tan siltstone. KIMB5 (encompassing variants KIMB5A and KIMB5B) is dark grey, diffusely very thickly bedded, fine to medium grained and variably olivine-rich. Texturally, the majority of KIMB5A is classified as possible PK, whereas KIMB5B is assigned to RVK. KIMB7 (encompassing variants KIMB7A and KIMB7B) is grey-brown, variably bedded, fine to medium grained and variably olivine-rich. KIMB7A is well bedded and comprised entirely of olivine-rich and very olivine-rich RVK. KIMB7B is diffusely bedded or massive and comprised of less olivine-rich RVK and mud-rich RVK. Of the kimberlite units identified in Misery South and Misery Southwest Extension to date, KIMB7 is the most comparable to the main infill material in the Misery Main pipe.

Figure 7-9: Three-Dimensional Geological Models of Misery Main, South and Southwest Extension



Note: Figure prepared by Dominion. Data used are current as at end July, 2016. Inclined views to the (a) northwest and (b) southeast of the Misery South and Misery Southwest Extension geological model showing internal geological domains K2 (green), K5 (dark blue), K7 (brown), RFW+XENO (yellow) and NoGeol (pink) in relation to Misery Main (light blue) and the traces of delineation drill holes. The position of the geographic divide between Misery South and Misery Southwest Extension is also shown (red vertical dashed line).

Large (>1 m drill intercept) country rock xenoliths interpreted to occur within the body have been included in these domains. Each domain additionally contains minor amounts of uncorrelated kimberlite (denoted as "requires further work", or RFW).

A fourth domain (RFW+XENO) was defined to represent a volumetrically minor zone in which RFW and country rock xenoliths appear to be concentrated, representing a greater degree of complexity and dilution than apparent in the surrounding K7 domain. The previous extent of the lower 'no geology' zone has been reduced in the updated model; the significantly reduced upper 'no geology' zone has been included in the K7 domain.

7.3.4.3. Other Kimberlite Bodies in the Misery Area

Misery Northeast is a small steep-sided pipe that plunges steeply towards the northeast (refer to Figure 7-8). A single drill hole through the centre of the pipe intersected a variably olivine-rich RVK unit as well as several large mudstone xenoliths and thin intervals of coherent/pyroclastic kimberlite.

The limited information available for Misery Southeast suggests a pipe and sheet complex comprised of VK and MK. The MK is texturally similar to that observed in the other satellite intrusions and appears to occur as a series of sub-horizontal and steeply dipping sheets likely emplaced prior to the pipe. No internal domains have been differentiated in Misery Southeast to date.

The remaining bodies, including the East dyke, appear to consist entirely of macrocrystic magmatic kimberlite and are interpreted to be small precursor intrusions. Available evidence suggests that the magmatic bodies form dykes and small plugs that appear to trend outwards from a focal point co-incident with the Misery Main pipe. None of the bodies transect Misery Main or Misery South/Misery Southwest Extension, suggesting that they probably pre-date these pipes.

7.3.5 Pigeon

The Pigeon kimberlite pipe is located 5 km northwest of the Koala pipe. The Pigeon kimberlite occurs along a regional, transitional lithological contact between syn-tectonic granitoid rocks and Yellowknife Supergroup metasedimentary rocks that runs in a southeast–northwest orientation (Kjarsgaard, 2001). Two parallel diabase dykes intrude in a north–south direction adjacent to the Pigeon pipe. The pipe is overlain by anomalously thick (up to 30 m) rolling ground moraine, composed of boulders, gravel with lesser sand and silt.

Pigeon is estimated at approximately 3.5 ha at surface (275 m by 140 m) and is a steep-sided pipe. It is oblong along a northwest to southeast axis and is referred to as having a south lobe and north lobe.

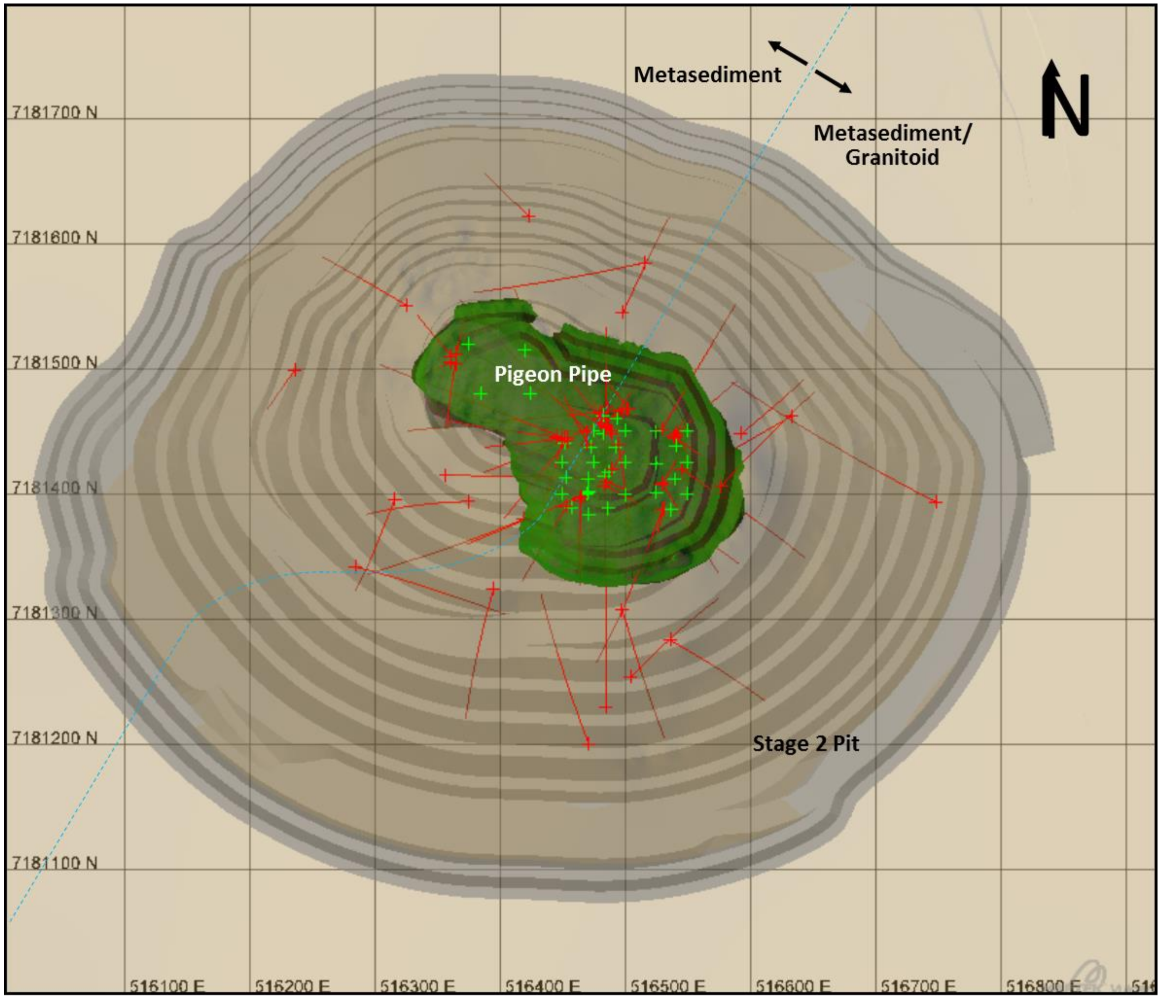
The Pigeon pipe contains four kimberlitic domains:

- Upper Crater (UC) domain: a thick sequence of mud-rich, variably olivine-rich, lithic RVK;
- Lower Crater (LC) domain: texturally-complex VK characterised by variable alteration and a high proportion of granitoid country rock xenoliths with minor amounts of mud and shale;
- Magmatic domain (MK): texturally complex rocks with both magmatic and volcaniclastic textures and variable dilution with common granitoids and extremely rare mud and shale. In general it is a massive MK consisting of olivine macrocrysts and phenocrysts in a dark, very fine grained crystalline matrix;
- Intrusive South Crater (SC) domain: located along the southernmost portion of the pipe and characterised by massive, fine grained autolithic MK with low abundance of olivine macrocrysts and with conspicuous fragments of diabase xenoliths. This unit was not sampled for grade but it is considered to have low diamond-carrying capacity due to unfavourable geochemistry and microdiamond results.

There is a distinct but variable zone of wall rock xenoliths extending from the base of the Upper Crater domain to the top of the Magmatic domain.

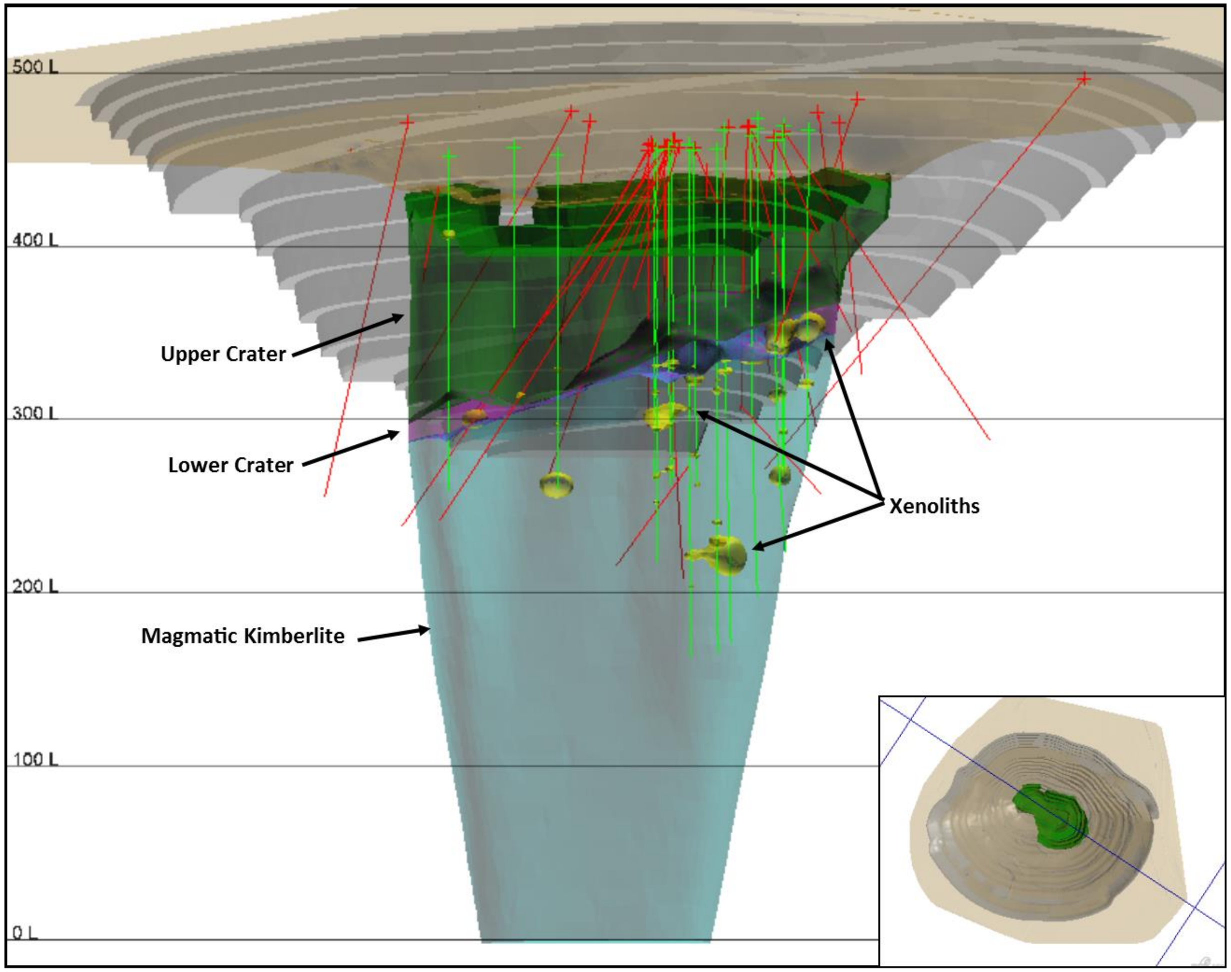
Figure 7-10 is a deposit plan view, and Figure 7-11 is an isometric view of the Pigeon kimberlite pipe illustrating the morphology of the deposit.

Figure 7-10: Plan View, Pigeon Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Grid is as labelled (100 x 100 m). Wall rock contacts change gradually; the pale blue line represents the change from almost 100% metasediments to granite mixed with metasediment. Drill hole traces are coded by drill hole type, green = RC, red = core.

Figure 7-11: Isometric Cross Section, Pigeon Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. The section looks northeast (36º) with a slight incline (-15º). Grey = pit outline. Drill hole traces are coded by drill hole type, green = RC, red = core. Green = Upper Crater, purple = Lower Crater, pale blue = Magmatic Kimberlite, yellow = Xenoliths. Elevation is as labelled (50 m spacing).

7.3.6 Sable

The Sable kimberlite pipe is located approximately 16 km northeast of the Ekati process plant complex.

The Sable pipe is hosted by Archean two-mica granite. Linear magnetic features have been observed under and adjacent to Sable Lake and are interpreted to be mafic dykes. The pipe lies under Sable Lake and is covered by water and boulder- and gravel-dominated glacial till overburden.

The pipe sub-surface area is approximately 2 ha and the pipe has surface dimensions of 180 m by 140 m. It has an irregular triangular outline in plan view and a steep-sided vase shape; the pipe at approximately 200 m below surface is wider (2.4 ha) than the top or bottom of the model.

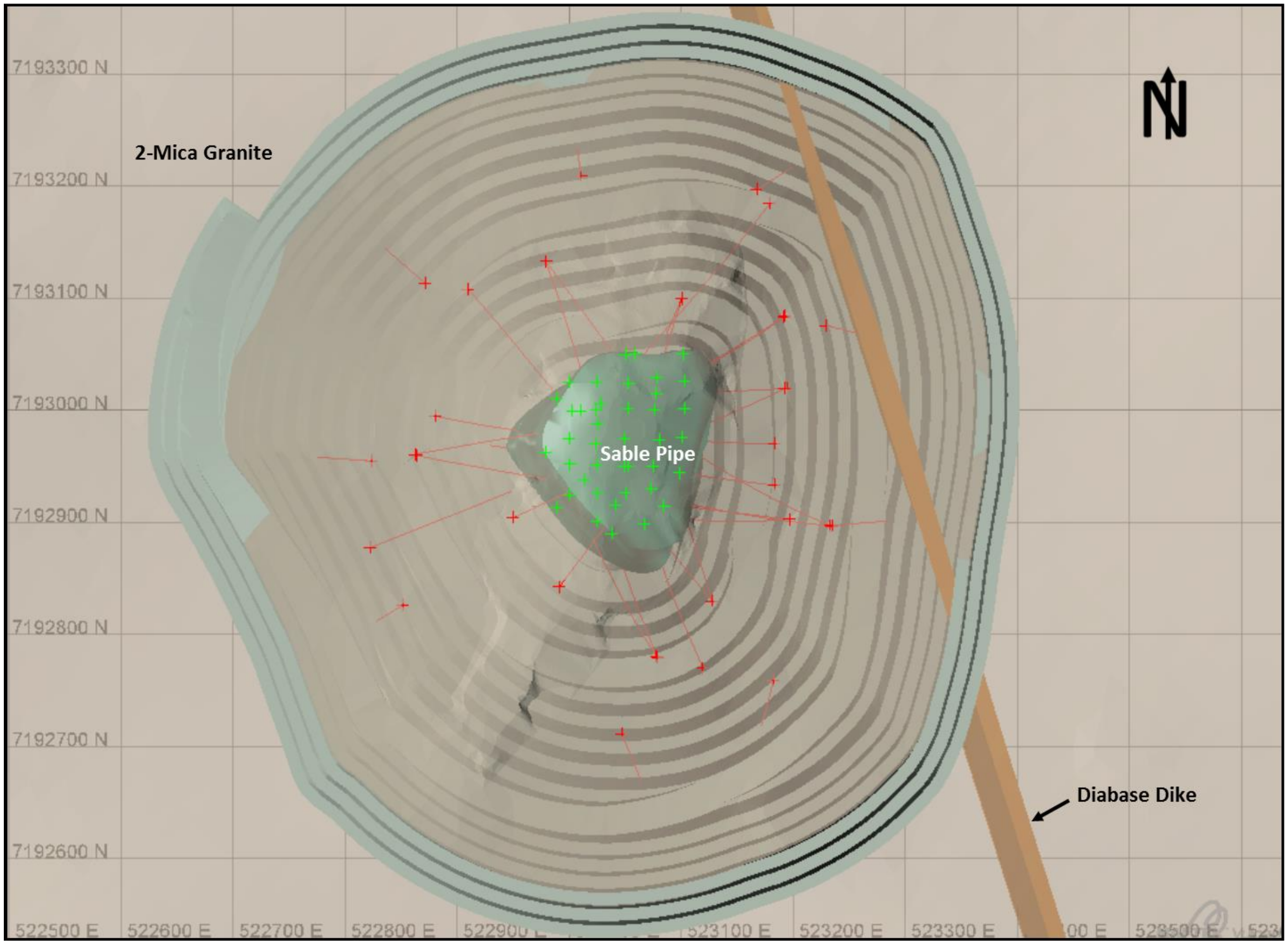
The Sable kimberlite contains two main VK lithologies:

- Olivine-rich RVK (ORVK): massive, matrix-supported, kimberlite with less than 30% fine- to medium-grained olivine, scattered mudstone clasts, rare small granite xenoliths and common wood fragments set in a dark, fine-grained matrix dominated by mud;
- Very olivine-rich VK (vOVK): clast-supported, very olivine-rich VK with common mudstone clasts, scattered granite xenoliths and carbonised wood fragments. Olivine content commonly exceeds 50% and due to the significantly lower proportion of muddy matrix material, the kimberlite is generally pale to dark greenish-brown/grey in colour.

Kimberlite intersections have been assigned to two major domains based on drill core observations. An Upper Crater domain is characterised by a significant proportion of ORVK. This kimberlite type generally dominates the upper portion of the kimberlite with increasing amounts of interbedded pale vOVK occurring with depth. The Lower Crater domain is dominated by vOVK, with the presence of scattered large (4 to 15 cm) granite xenoliths. The domain boundary is currently defined at the point below which matrix supported ORVK becomes an insignificant component.

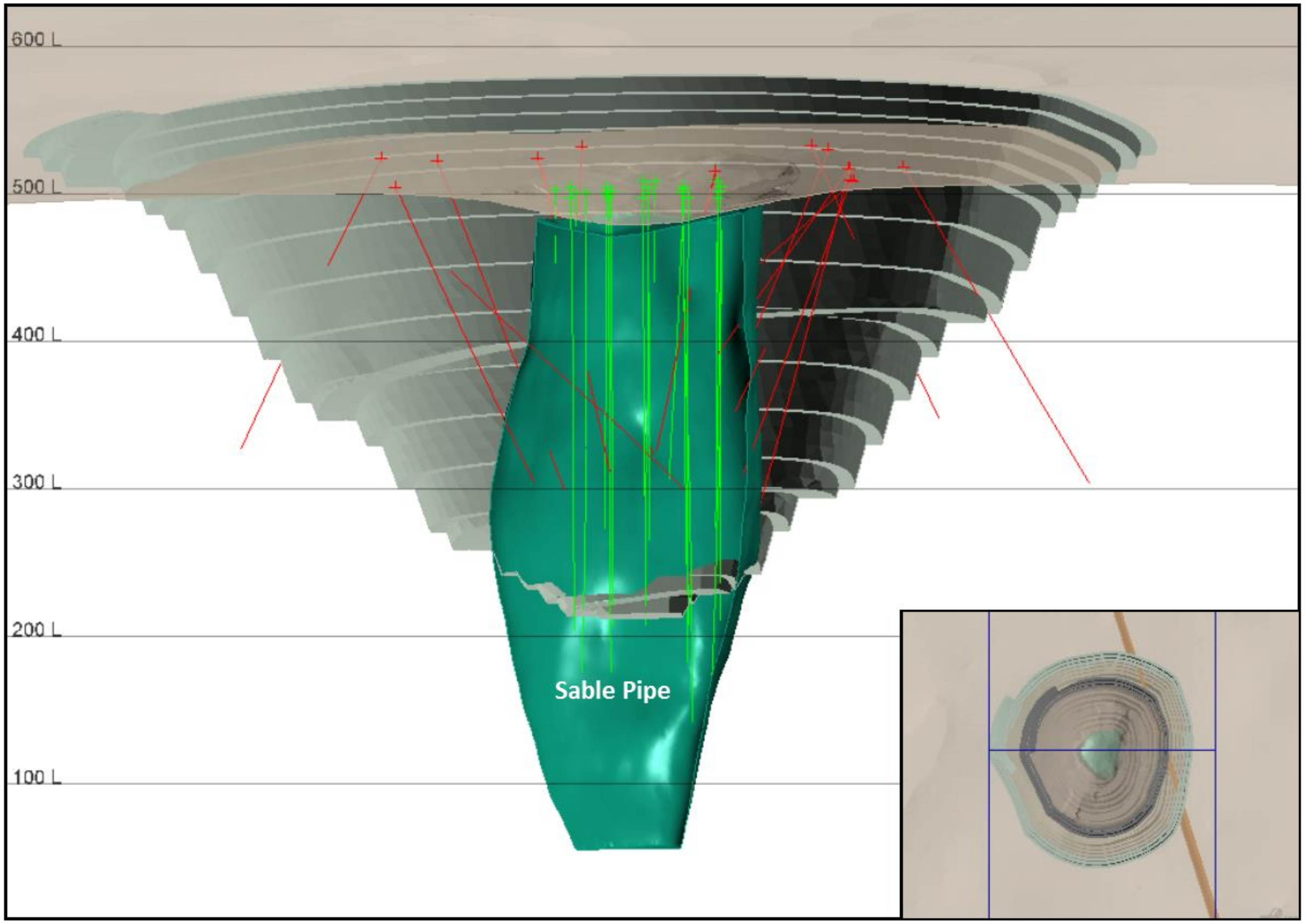
Figure 7-12 is a plan view and Figure 7-13 is an isometric view of the Sable kimberlite pipe.

Figure 7-12: Plan View, Sable Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Grid is as labelled (100 x 100 m). Wall rock is predominantly two-mica granite. Drill hole traces are coded by drill hole type: green = RC, red = core

Figure 7-13: Isometric Cross-Section, Sable Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Section is looking north (northing 7192970) with a slight incline (-11º). Brown = layer of overburden, grey = pit design, green = Sable Pipe. Drill hole traces are coded by drill hole type, green = RC, red = core. Elevation is as labelled (100 m spacing).

7.3.7 Jay

The Jay kimberlite pipe is located in the southeastern corner of the property, about 25 km southeast of the Ekati main camp, and about 7 km north–northeast of the Misery Main pipe.

The Jay pipe is hosted within granitic rocks, ranging from granite to granodiorite in composition. A regional contact with meta-sedimentary rocks occurs to the west, and a diabase dyke trending approximately east–west occurs to the north of the pipe. Regional structures interpreted from geophysics extend east–west to the north of Jay and north–south to the west of Jay. The east–west structure to the north of Jay is partly associated with the diabase dyke; however, other zones of increased jointing have also been recognised in two core holes. The north–south structure is associated with the metasediment–granite contact.

The pipe is under Lac du Sauvage, overlain by about 30 m of water and 5 to 10 m of overburden.

The plan surface area of Jay is approximately 13 ha, and it has an extent of 375 m by 350 m. Jay has a roughly circular outline in plan view and a steep-sided vase shape. The sides of the pipe are interpreted to be roughly planar with minor concavities and bulges. The shape, particularly the north side, is believed to be coincident with geological structures.

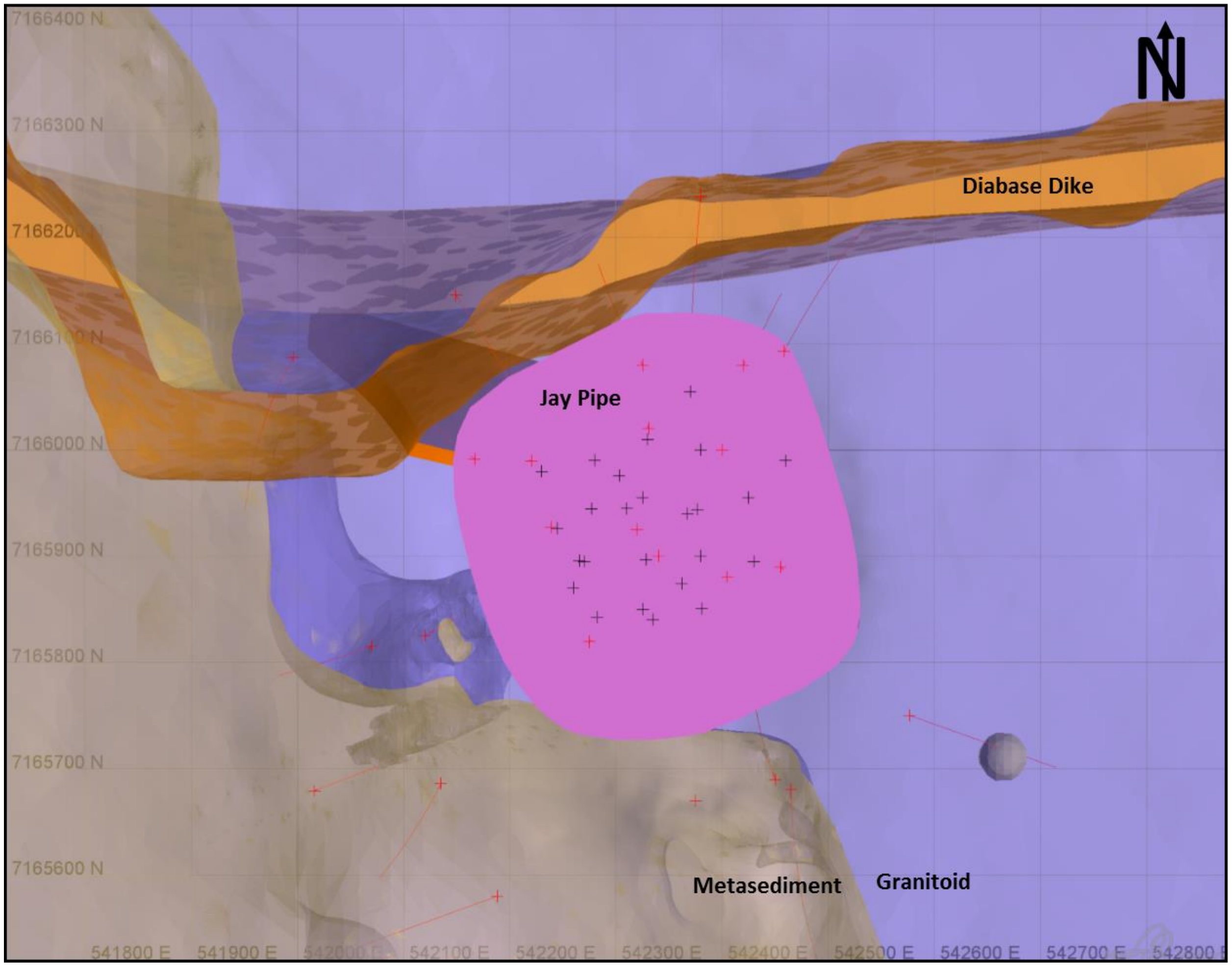
The pipe is divided into the following three domains:

- Resedimented volcaniclastic kimberlite (RVK): uppermost 110 to 170 m in stratigraphic thickness. Small-scale chaotic bedding is present which is defined by waves of silty to sandy laminates, and variations in olivine abundance. Variable amounts and sizes of black-, pale grey-, blue–grey-, blue–green-, brown-, and tan-coloured mudstones and siltstone xenoliths are present. Rare shale breccia is present. The olivine content of the RVK appears to increase with depth;
- Transitional Kimberlite (MIX): 20 to 70 m thick package of interbedded RVK and volcaniclastic kimberlite (VK) material with varying degrees of alteration. The transition from RVK to MIX is indistinct and is marked by the appearance of small interbeds of fresh to highly altered, dark to pale coloured VK;
- VK: Primarily olivine-rich, competent, grey-blue to green volcaniclastic kimberlite with partially altered olivine set in a serpentinised matrix. The upper contact of the VK domain is marked by the absence of RVK and presence of highly-altered, pale-coloured VK material. Small, irregularly shaped, mudstone and granitic xenoliths are present, but decrease in abundance with depth.

These domains are sub-horizontal and are interpreted to extend the width of the pipe. Boundaries between the domains are transitional in nature.

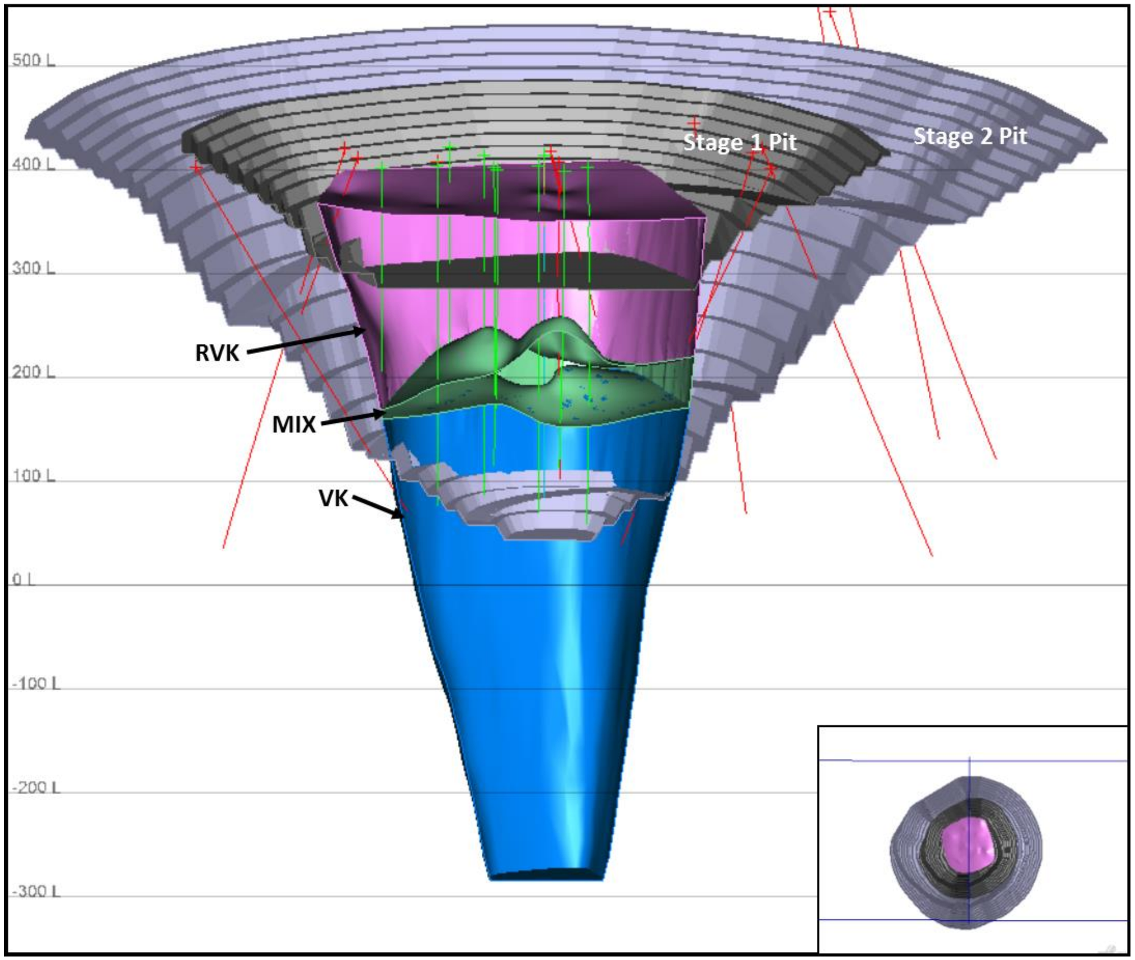
Figure 7-14 is a plan view, and Figure 7-15 is an isometric view of the Jay kimberlite pipe.

Figure 7-14: Plan View, Jay Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Grid is as labelled (100 x 100 m). Drill hole traces are coded by drill hole type: black = RC, red = core.

Figure 7-15: Isometric Cross-Section, Jay Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Section is looking east (easting 542335) with a slight incline (-15º). Colour key: purple = RVK, green = mix zone (RVK and VK), blue = VK, grey = stage 1 pit, dark blue-grey = stage 2 pit. Drill hole traces are coded by drill hole type: green = RC, red = core. Elevation is as labelled (100 m spacing)

7.3.8 Lynx

The Lynx kimberlite pipe occurs in the southeastern portion of the Ekati property about 30 km from the Ekati main site facilities and approximately 3 km to the southwest of the Misery pipe.

The Lynx pipe is hosted by two-mica granite. The area immediately surrounding the Lynx pipe is transected by numerous probable diabase dykes, one of which runs very close to the northwestern margin of the pipe. The pipe lies within a small lake and is covered by approximately 18 to 30 m of water as well as boulder- and gravel-dominated glacial till that is 10 to 17 m thick.

The Lynx pipe has an elongated, steep-sided pipe morphology. In plan, the pipe is roughly tear-shaped (approximately 0.7 ha surface area, 150 m by 65 m) with the narrow portion of the pipe extending towards the west. The available drill data suggest that the more voluminous eastern portion of the pipe tapers inwards sharply.

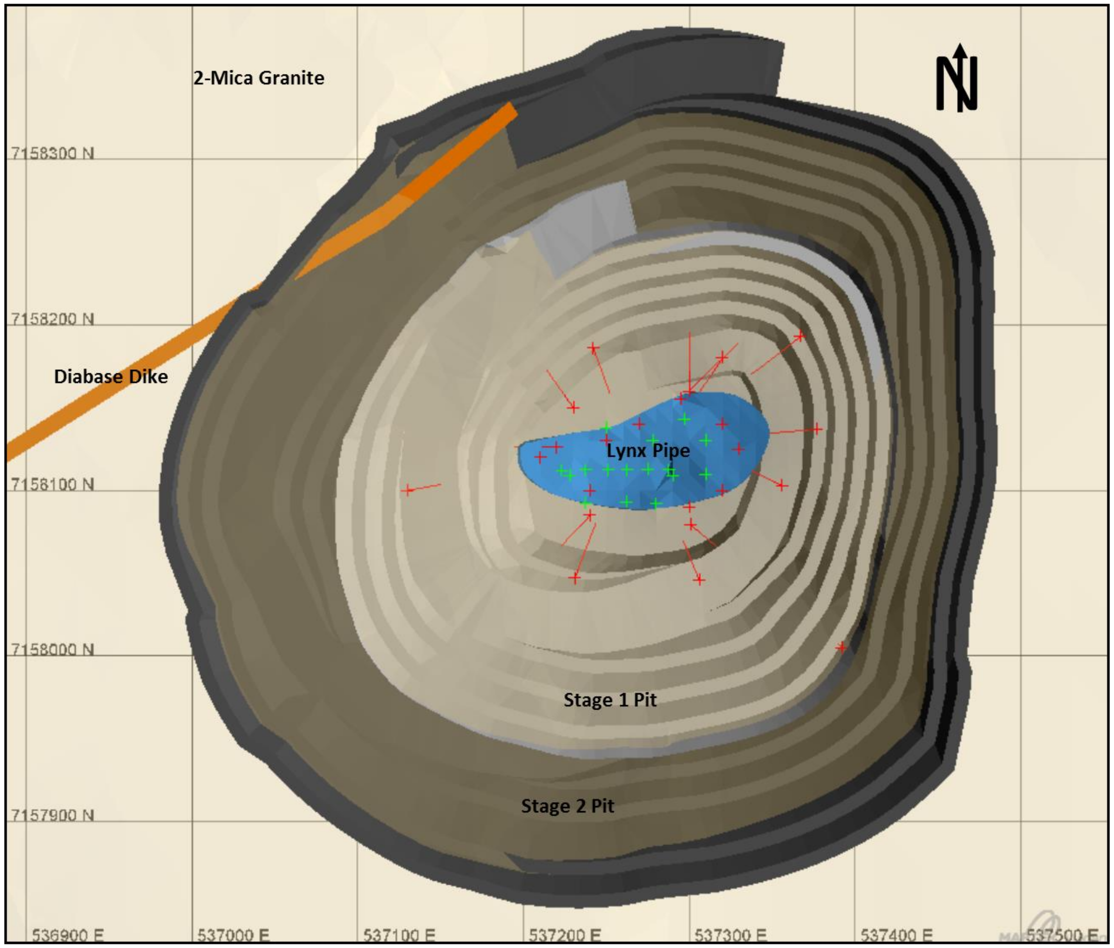
The pipe is divided into an upper RVK domain and lower PVK domain. Drilling undertaken to date suggests that the PVK domain forms a steeply dipping wedge underlying the RVK domain, and extends up into the eastern portion of the pipe.

The RVK domain is dominated by olivine-rich RVK with 15 to 50% partially altered to fresh medium- to coarse-grained olivine macrocrysts set in a dark, mud-like matrix. Also present are minor amounts of small (generally less than 2–3 cm) grey to black mudstone clasts; between 1 and 3% rounded, fresh granite xenoliths ranging from approximately 1–10 cm; and occasional wood fragments. Lesser amounts of olivine-poor RVK (similar to above, but with less than 15% olivine) and minor interbedded epiclastic kimberlite are also present.

The PVK domain consists of very olivine-rich PVK which contains between 40% and 70% coarse-grained, fresh to altered, olivine macrocrysts set in a microcrystalline, serpentine-dominated matrix. Other components include relatively abundant rimmed magma clasts, autoliths of RVK (1–5%), and common granite xenoliths (5–15%).

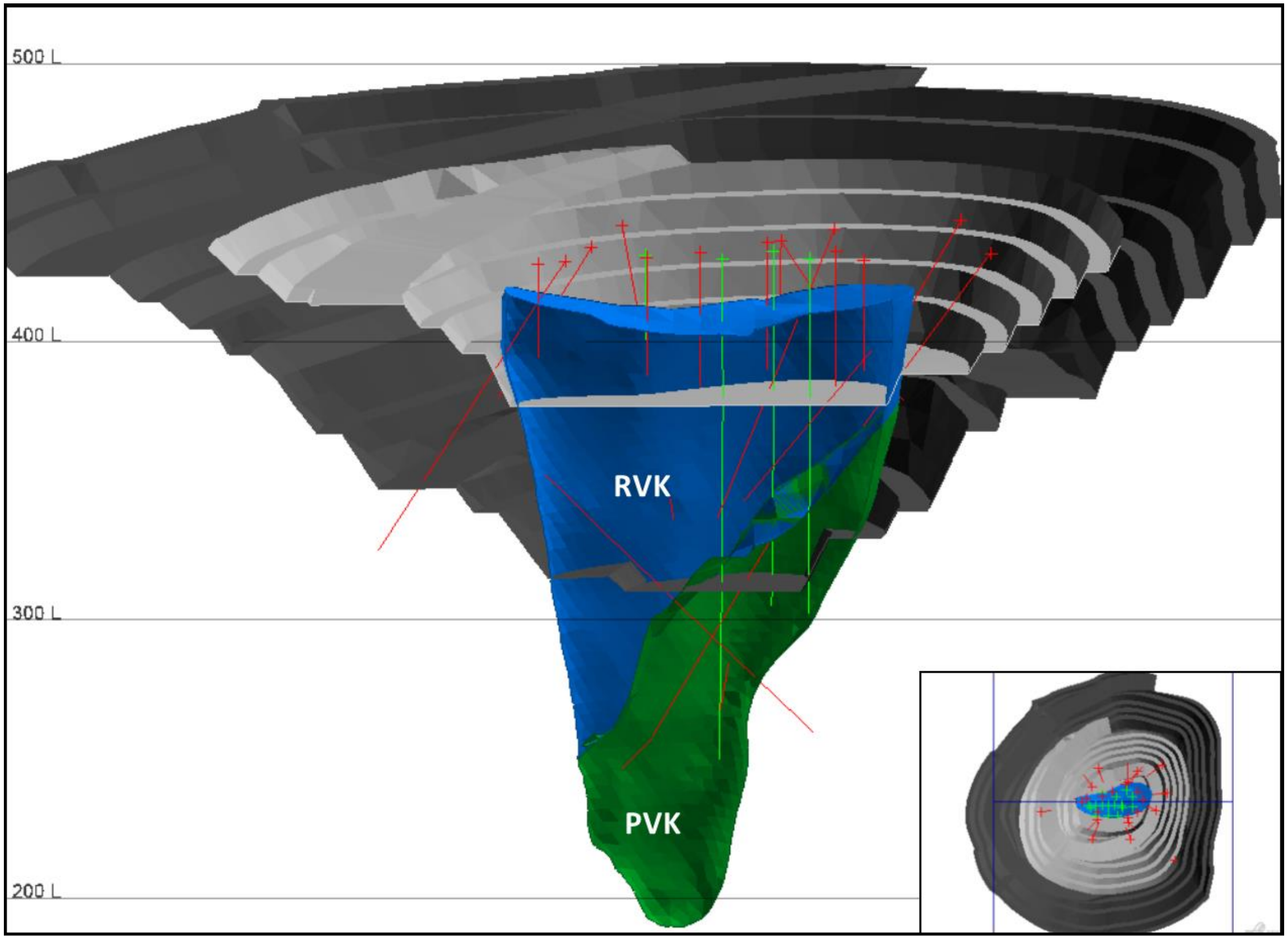
Figure 7-16 is a plan view and Figure 7-17 is an isometric view of the Lynx kimberlite pipe.

Figure 7-16: Plan View, Lynx Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Light grey = Stage 1 pit design, dark grey = Stage 2 pit design. Drill hole traces are coded by drill hole type: green = RC, red = core. Blue = Lynx Pipe. Grid is as labelled (100 x 100 m).

Figure 7-17: Isometric Cross-Section, Lynx Pipe



Note: Figure prepared by Dominion. Data are current as at end July, 2016. Section is looking north (northing 7158110) with a slight incline (-6º). Light grey = Stage 1 pit design, Dark grey = Stage 2 pit design. Drill hole traces are coded by drill hole type, green = RC, red = core. Blue = RVK, green = PVK. Elevation is as labelled (100 m spacing).

7.4 Mineralogy

Ekati kimberlite is predominately volcaniclastic and epiclastic material. The mineralogy is relatively simple with olivine and serpentine comprising approximately 60–70% of the rock. The following summary of the typical mineralogy is primarily based on studies completed at Panda and Koala:

- Serpentine – $Mg_3Si_2O_5(OH)_4$: Serpentine typically occurs as very fine-grained (<0.01 mm), grey or brown, massive to acicular aggregates in the fine-grained kimberlite matrix. It is also a common alteration product of olivine (see below);
- Olivine – $(Mg,Fe)_2SiO_4$: Olivine is typically highly fractured and varies in size from 0.1 mm to as large as 20 mm in diameter. In mud rich RVK, olivine may be altered to serpentine. Electron microprobe analysis of olivine from kimberlite shows these to be forsteritic ($MgSiO_4$) in composition, with MgO contents placing these in the Fo90 to Fo94 range. Olivine is the primary host of the Ni found in kimberlites (typically contains between 0.2 and 0.3 wt% Ni);
- Oxides: The oxides within the kimberlite are found within the fine-grained matrix and are approximately 1 to 10 μm in diameter. They are usually minerals that belong to the perovskite, ilmenite and various spinel groups and contain varying amounts of Ca, Ti, Mg, Fe, Al, and Mg;
- Phlogopite – $K_2Mg_6Si_6Al_2O_{20}(OH)_4$: Phlogopite is the only primary mica mineral found within the kimberlite. The crystals are long thin tabular and commonly kinked. Concentrations are typically in less than 5%. When altered, phlogopite commonly breaks down to clays and chlorite;
- Pyroxene – $(Mg,Ca,Fe)_2Si_2O_6$: Two varieties of pyroxene may occur, chrome diopside (a Ca and Mg-rich clinopyroxene) and enstatite (a Ca-poor, Mg-rich orthopyroxene). Both of these are mantle-derived xenocryst minerals with clinopyroxene being a minor component and orthopyroxene a very rare component of the kimberlite. Cr-diopside is characterised by a distinctive apple-green colour and is by far the dominant pyroxene in kimberlite. Enstatite is pale green, and alters easily to serpentine and other clay minerals;
- Garnet – $(Mg,Fe,Ca)_3(Al,Cr)_2Si_3O_6$: Garnet, also a mantle derived xenocryst mineral, is one of the key mineral indicators for kimberlite but it makes up very low percentage of samples usually less than 5%. It occurs as highly fractured grains with a wide range in colour including red, purple, pink, orange and colourless varieties. The garnets may be partially to completely altered, and most have kelyphitic rims as a product of the alteration. Three main garnet varieties are present: Cr-rich pyrope of peridotitic origin; Cr-poor eclogitic/websteritic pyrope; and Cr-poor to moderately Cr-rich megacryst pyrope. Peridotitic garnet typically

dominates, with eclogitic/websteritic and megacryst varieties generally being significantly less abundant.

- Calcite – $CaCO_3$: Calcite is one of the primary components of the groundmass material within the pelletal and juvenile lapilli found within the kimberlite. Typical concentrations of calcite vary from 2.5 to 5.0 wt%;
- Sulphide and sulphate: Sulphide (and/or sulphate) minerals are typically restricted to the mud xenoclast phases and muddy matrix in kimberlite. They are present as very fine grained framboidal grains ranging in size from 0.5 μm to 10 μm in diameter. Energy dispersive spectrometric analysis (EDS) indicates that the likely sulphate phase is gypsum or anhydrite. Comparative sulphide studies between mud xenoliths and the kimberlite ore, reveal that the latter had lower sulphide (0.21 wt%) and sulphate (0.14 wt%) content as compared with the former (2.54 wt% and 0.27 wt%, respectively);
- Clay mineralogy: Clay is a dominant component of mud-rich RVK where it occurs both as an alteration product, and as fine-grained argillaceous material originally derived from surface sediments (mud) that were incorporated into the kimberlite. X-ray diffraction (XRD) analysis indicates that the clays are dominated by smectite-group minerals.

7.5 Comments on Geological Setting and Mineralization

In the responsible QPs' opinion, the geological understanding of the settings, lithologies, structural and alteration controls on kimberlite emplacement, and kimberlite continuity and geometry in the different pipes is sufficient to support estimation of Mineral Resources and Mineral Reserves.

8.0 DEPOSIT TYPES

This section provides a generalised description of kimberlite diamond deposits, outlining the geological and mineralisation model that formed the basis for kimberlite exploration and evaluation work at Ekati. The content is derived from a Mineral Services memorandum to Dominion (Mineral Services Canada, 2013).

The primary source rocks for diamonds that are presently being mined worldwide are Group 1 and Group 2 kimberlites and lamproites (Levinson et al., 2002). Of these rocks, Group 1 kimberlites represent the vast majority of primary diamond deposits that are presently being worked, and the Ekati Diamond Mine is one such example.

Kimberlites are mantle-derived ultramafic magmas (>150 km depth) that transport diamonds together with the rocks from which the diamonds are directly derived (primarily peridotite and eclogite) to the earth's surface (e.g. Mitchell, 1986; Mitchell 1995). They are considered to be hybrid magmas comprising a mixture of incompatible-element enriched melt (probably of carbonatitic composition) and ultramafic material from the lower lithosphere that is incorporated and partly assimilated into the magma (Russell et al., 2012).

The products of direct crystallisation of Group 1 kimberlite magma (referred to as coherent or magmatic kimberlite) are typically dominated by olivine set in a fine-grained matrix commonly rich in serpentine and/or carbonate as well as varying amounts of phlogopite, monticellite, melilite, perovskite and spinel (chromite to titanomagnetite) and a range of accessory minerals (Mitchell, 1995). While some olivine crystallises directly from the kimberlite magma on emplacement (to form phenocrysts), kimberlites generally include a significant mantle-derived (xenocrystic) olivine component that typically manifest as large (>1 mm) rounded crystals. In addition to olivine, kimberlites also commonly contain significant quantities of other mantle-derived minerals, the most common and important being garnet, Cr-diopside, chromite and ilmenite. These minerals, commonly referred to as indicator minerals, are important for kimberlite exploration and evaluation as they can be used both to find kimberlites (by tracing indicator minerals in surface samples) and to provide early indications of their potential to contain diamonds (Nowicki et al., 2007; Cookenboo and Grütter, 2010).

The texture and components observed in coherent kimberlites can be substantially modified by dilution with wall-rocks or surface sediments, as well as by sorting and elutriation (removal of fines) processes occurring in volcanic environments (Mitchell, 1986; Nowicki et al., 2008; Scott Smith and Smith, 2009).

The emplacement of kimberlite at or just below the surface of the crust is influenced by many factors which include the following:

- Characteristics of the magma (volatile content, viscosity, crystal content, volume of magma, temperature etc.);
- Nature of the host rocks (i.e. unconsolidated mud vs. hard granite);
- The local structural setting;
- The local and regional stress field;
- The presence of water.

Kimberlites at surface are manifested as either sheet-like intrusions (dykes or sills) or irregular shaped intrusions and volcanic pipes. The sheets and irregular intrusions are typically emplaced along pre-existing planes of weakness in the country rock, and do not involve explosive volcanic activity. The pipes are generated by explosive volcanic activity related to the degassing of magma, or the interaction of mama and water, or a combination of both these processes (e.g. Mitchell, 1986; Lorenz et al, 1999; Sparks et al, 2006).

Due to the wide range of settings for kimberlite emplacement, as well as varying properties of the kimberlite magma itself (most notably volatile content), kimberlite volcanoes can take a wide range of forms and be in-filled by a variety of deposit types (e.g. Scott Smith, 2008).

Volcanic kimberlite bodies range in shape from steep-sided, carrot-shaped pipes (diatremes) to flared champagne-glass or even “pancake” like crater structures. While diatremes are often interpreted to generally be overlain by a flared crater zone, there are a few instances where both zones are preserved (e.g. the Orapa kimberlite in Botswana; Fox kimberlite at Ekati). These volcanic structures are infilled by a very wide range of volcaniclastic kimberlite types, ranging from massive, minimally texturally modified pyroclastic kimberlite, to highly modified pyroclastic and resedimented volcaniclastic deposits that have been variably affected by dilution, sorting, and removal of fines (e.g. Field and Scott Smith, 1999; Nowicki et al., 2004; Skinner and Marsh, 2004).

The Ekati kimberlites are primarily steep-sided volcanic pipes that are mostly filled with volcaniclastic material interpreted to be resedimented and lesser primary volcaniclastic (pyroclastic) kimberlite (Nowicki et al., 2004). While narrow hypabyssal kimberlite dykes are present, these are not volumetrically significant. These mostly appear to predate kimberlite and are commonly transected by the volcanic pipes. Coherent kimberlite is present in some pipes either as late stage intrusive material emplaced into volcaniclastic kimberlite (e.g. Koala), or as large pipe-filling bodies (e.g. Leslie; Grizzly).

Kimberlites commonly show physical property contrasts with the rocks into which they are emplaced. As a result, in most cases, kimberlites generate geophysical anomalies that can be detected by airborne and ground geophysical surveys (e.g. Macnae, 1995). Properties that are most relevant in kimberlite exploration are magnetic susceptibility, electrical conductivity and specific gravity.

Diamonds also represent a xenocryst mineral within kimberlite as they are primarily formed and preserved in the deep lithospheric mantle (depths > ~150 km), generally hundreds of millions to billions of years before the emplacement of their kimberlite hosts (Gurney, 1989). The diamonds are “sampled” by the kimberlite magma and transported to surface together with the other mantle-derived minerals described above. Diamonds themselves occur in such low concentrations (even in economic kimberlites) that they are rarely useful for locating kimberlites and, following discovery, large samples are required in order to directly assess the diamond grade potential of a kimberlite (e.g. Rombouts, 1995; Dyck et al., 2004).

In general, diamonds can vary significantly within and between different kimberlite deposits in terms of total concentration (i.e. diamond grade in cpt), particle size distribution and physical characteristics (e.g. colour, shape, clarity and surface features). The value of each diamond, and hence the overall average value of any given diamond population, is governed by the size and physical characteristics of the stones.

The overall concentration of diamonds in a kimberlite unit or domain is dependent on several factors (Nowicki et al., 2007), including:

- The extent to which the source magma has interacted with and sampled potentially diamondiferous deep lithospheric mantle;
- The diamond content of that mantle (diamonds are only present locally and under specific pressure temperature conditions in the mantle);
- The extent of resorbtion of diamond by the kimberlite magma during its ascent to surface and prior to solidification;
- Physical sorting and/or winnowing processes occurring during volcanic eruption and deposition;
- Dilution of the kimberlite with barren wall-rock material or surface sediment (in the case of crater deposits).

At Ekati, the extent of mantle sampling, the degree of dilution by wall-rock and surface sediments and volcanic sorting processes are considered to be the main factors controlling variation in total diamond grade. The diamond size distribution characteristics are inherited from the original population of diamonds sampled from the mantle but can be affected by a number of secondary processes, including resorbtion and sorting during eruption and deposition of volcaniclastic kimberlite deposits.

The physical characteristics of the diamonds are largely inherited from the primary characteristics of the diamonds in their original mantle source rocks but can be affected by processes associated with kimberlite emplacement and eruption (e.g. Gurney et al., 2004). Most notable of these are:

- Formation of late stage coats of fibrous diamond either immediately prior to or at the early stages of kimberlite emplacement;
- Chemical dissolution (resorbtion) by the kimberlite magma resulting in features ranging from minor etching to complete dissolution of the diamonds;
- Physical breakage of the diamonds during turbulent and in some cases explosive emplacement processes.

8.1 Comment on Deposit Type

In the opinion of the responsible QPs, the Ekati kimberlites are considered to be examples of a Group 1 kimberlite deposit and display most of the typical features of Group 1 kimberlite pipes. Based on this model, the exploration programs completed to date are appropriate to the mineralization style and setting.

With reference to the generalised deposit model and characteristics of the mineralisation described in this section, the aim of the exploration and evaluation work documented in this Report is, and has been, to:

1. Undertake indicator mineral sampling of surface materials (primarily esker and till deposits) to detect the presence and track down the location of kimberlite bodies;
2. Implement airborne and ground-based magnetic, electromagnetic and gravity surveys to locate kimberlites;
3. Drill test and adequately sample each body for petrography, indicator minerals and diamonds, and analyse and interpret the results from these samples to confirm the presence of kimberlite and support prioritisation of kimberlites for advanced evaluation work;

4. Delineate and interpret the external and internal geology of prioritised deposits so that three-dimensional (3D) models can be produced that reliably represent each body;
5. Evaluate prioritised kimberlites by means of bulk sampling and processing to recover diamonds for estimation of the grade and average diamond value of the main geological domains present.

9.0 EXPLORATION

This section contains a summary of the information on the exploration programs conducted that were described in more detail in Heimersson and Carlson (2013). The reader is referred to this earlier technical report for additional program details.

9.1 Grids and Surveys

The UTM Nad83 Zone 12N is the basis for all survey data. The digital elevation model (DEM) was interpolated from 1 m, 2 m and 5 m contour data from an airborne survey flown in 2002 by Eagle Mapping.

9.2 Mapping

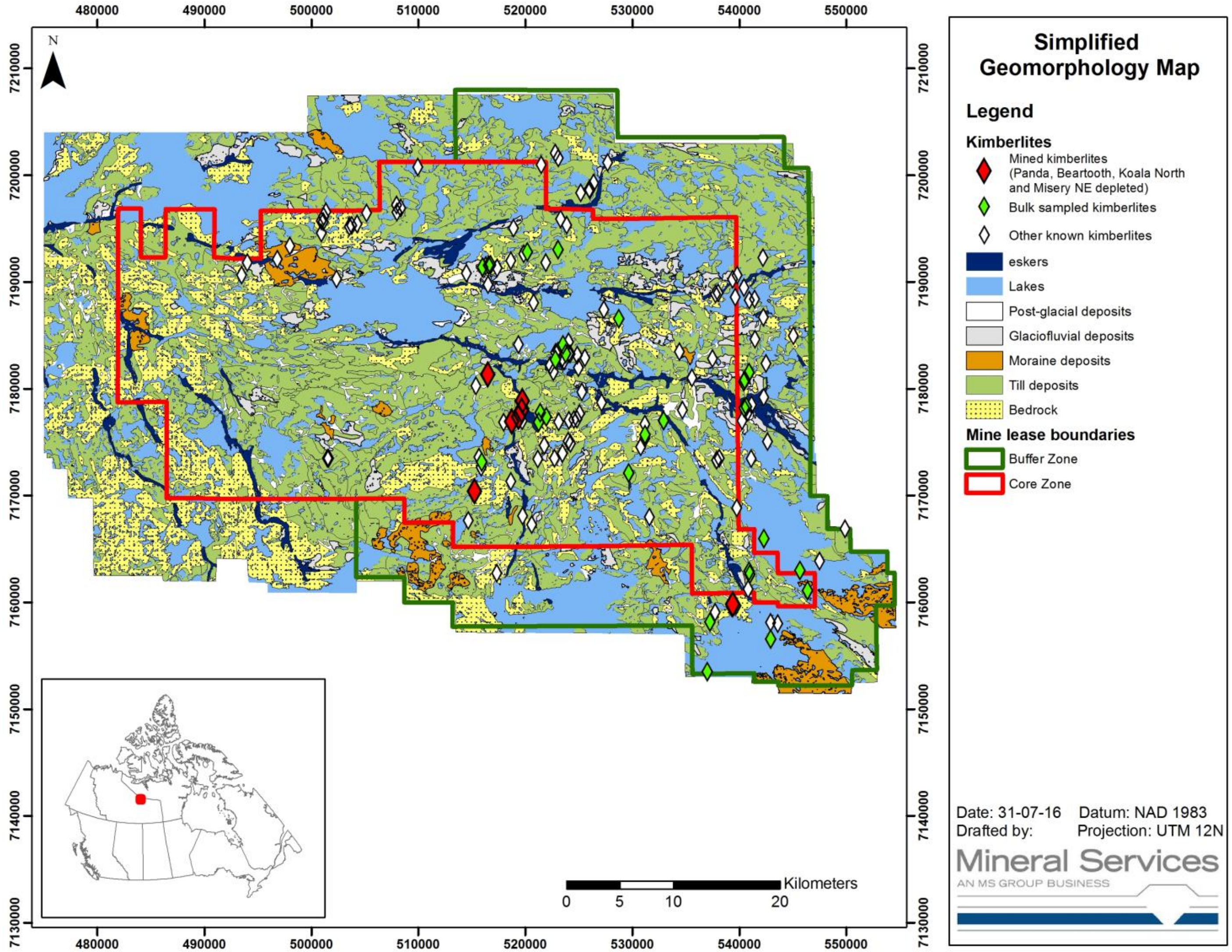
9.2.1 Surface Mapping

Bedrock mapping of the Ekati property and surrounding area was undertaken by the Geological Survey of Canada between 1994 and 2001 (Thomason and Kerswill, 1994; Kjarsgaard et al., 1994a, b; Kjarsgaard et al., 1999; Kjarsgaard, 2001). The resultant maps were augmented and modified by Ekati geologists based on airborne magnetic data (e.g. Kirkley, 1994).

Helmstaedt (2002) undertook a detailed review, compilation, and interpretation of previously published and internal Ekati geological work in the area and integrated this with high-resolution aeromagnetic data to provide an updated bedrock map of the Ekati property. A simplified version of this map is presented in Figure 7-2 in Section 7.

A detailed geomorphology map (1:10,000) of glacial overburden material was compiled by Mr. Roger Thomas during 2000. A simplified version of this map is included as Figure 9-1. The geomorphology map was used in combination with field observations to interpret heavy mineral sampling results.

Figure 9-1: Simplified Geomorphology Map



9.2.2 Mine Mapping

As each bench is exposed in the open pits, kimberlite/wall-rock and internal domain contacts are geologically mapped and surveyed. Specific geological information, such as olivine and granite content is collected as indicators of grade. Open pit wall mapping is done with a photogrammetry system. This allows large sections of wall to be photographed, and imported into Vulcan for processing of structural features.

During underground mining all major structures are mapped for geotechnical purposes as new levels are developed. This allows continuous updates of the fault and hydrological models and highlights any changes in discontinuity sets or rock competency. Within the kimberlite, development headings are visited regularly in order to maintain a record of kimberlite contacts, lithologies, physical properties, hydrology and relative grade.

9.3 Geochemical Sampling

The early stages of exploration for diamonds in the Northwest Territories consisted of territory-wide regional heavy mineral sampling from fluvial and glaciofluvial sediments on a scale of tens of kilometres (Fipke et al., 1995).

Property-wide (Core Zone and Buffer Zone) heavy mineral till sampling programs were carried out through the summers of 1990, 1991 and 1992, and nearly 6,000 till samples were collected. A total of approximately 15,000 till samples were taken across the Core Zone and Buffer Zone properties during the project exploration phase until exploration ceased in 2007.

Till samples were also used to prioritise airborne geophysical anomalies for drilling by collecting till samples at 250 m intervals along lines perpendicular to the dominant ice flow direction. The extent and chemistry of the indicator minerals dispersion trains were evaluated and used in combination with ground geophysical surveys to pinpoint drill targets.

9.4 Geophysics

9.4.1 Airborne Geophysical Surveys

Initial ground geophysical test surveys pinpointed the kimberlite target under Point Lake and prompted the flying of the entire property with helicopter-borne total field magnetics (TFM), electromagnetics (EM) and very low frequency electromagnetics (VLF). These programs were instrumental in detecting possible kimberlite pipes and in prioritising anomalies for diamond drilling. Table 9-1 summarizes the airborne programs completed on the Ekati property.

Table 9-1: Airborne Geophysical Surveys

Year	Program	Contractor	Details	Comments
1991 to 1993	Helicopter-borne EM, TFM and VLF surveys	DIGHEM^{V}	Core Zone and Buffer Zone; 125 m line spacing; 30 m EM bird height. High-sensitivity cesium vapour magnetometer and VLF EM system. Magnetometer sensor was towed in a bird that was 15 m above the EM bird and 10 m below the helicopter	The majority of the significant kimberlite pipes in the Ekati mine plan were targeted in 1992 through to 1994 using these data
1996	TFM Minimag system	High Sense Geophysics	Property wide, 75 m line spacing, east–west flight lines, nominal 20 m agl sensor height.	Beartooth kimberlite was identified in 1996. Twenty additional kimberlites were drill confirmed in 1998.
1999 to 2000	Helicopter-borne EM, TFM and VLF surveys	DIGHEM^{V}	Magnetometer installed inside the EM bird, and with GPS navigation and positioning technology. 100 m line spacing and 25 m bird spacing.	Numerous kimberlite discoveries, of which the most significant attributable to the survey was the Lynx kimberlite
2000	Airborne gravity gradiometer	Sander Geophysics	Property-wide, fixed wing survey, east–west flight lines.	Gravity gradient anomalies typically reflected bedrock density contrasts as well as changes in overburden thickness. Known kimberlite pipes were mostly detected by the system and a few new anomalies were drilled and confirmed as kimberlite
2006	Falcon helicopter survey	Fugro	This system included a gravity gradiometer, a horizontal gradient pair of magnetometers, and high resolution Resolve EM coils. The survey line direction was north–south, except for a few smaller blocks which were flown using east–west oriented survey lines. The line spacing was 50 m. The nominal flying height was 60 m. A wide variety of geophysical images were produced including digital elevation model, total magnetic intensity, first vertical derivative of total magnetic intensity, vertical gravity gradient, Fourier gravity grids, and Resolve co-planar at various frequencies (in-phase and quadrature responses).	A number of targets were identified on the Central, Misery, Sable and other smaller blocks

9.4.2 Ground Geophysical Surveys

Ground geophysics including TFM, EM (mostly horizontal loop EM), gravity, ground penetrating radar, bathymetry, and limited seismic surveys were used to enable more precise kimberlite/non-kimberlite target discrimination and estimates of pipe size.

Ground geophysical surveys were completed on the majority of the drill targets and were completed on all of the pipes with reported Mineral Resource estimates.

The airborne and ground survey results were used in combination to improve target resolution while retaining the regional geophysical context.

9.4.3 Core Hole Seismic Surveys

A limited core hole seismic survey was conducted by Vibrometric in January 2005 for the Koala pipe volume. Two underground boreholes were used as a test for the geophysical delineation of kimberlites. The aim of the technique was to obtain the most spatial information about the Koala pipe geometry possible from drill holes.

However, a full seismic program was not completed; some of the planned survey holes were blocked at shallow depths, replacement of a lost receiver string in a hole directly impacted the program budget, and a desire to keep the drill program schedule on target contributed to the cancellation of the program.

The limited data proved that the borehole seismic technique can augment drill hole pierce points with seismically-determined pipe wall contacts. Additional evaluation in the use of core hole seismic surveys may be warranted for delineation of large pipes.

9.5 Petrology, Mineralogy, and Research Studies

Extensive geoscientific research work has been undertaken on the Ekati property and samples derived from the Ekati Project area. This research covers a wide range of topics and disciplines including kimberlite geology and petrology, mantle petrology, diamonds, geochronology, palynology and paleontology, resource estimation and mining.

Many of the key publications on the Ekati Project are found in the proceedings of the 8th and 9th International Kimberlite Conferences (Mitchell et al., 2004; Foley et al., 2009).

9.6 Exploration Potential

There has been no exploration of the Ekati Project area for new kimberlites since 2007.

In most cases, individual kimberlite pipes were discovered based on coincident geophysical anomalies (magnetic and electromagnetic), with varying support from indicator mineral dispersion features. With the exception of a few outcropping kimberlites, initial discovery was via core drilling. In most cases, the discovery and initial exploration holes either drilled vertically from the frozen ice surface, or were angled and offset from the pipe, thereby generally providing initial pierce points. These, together with information on the pipe outline derived from geophysical data, provide an initial indication of the size of the body and supported first-pass estimates of potential kimberlite tonnages.

Kimberlite indicator mineral (KIM) compositions played a significant role in the successful exploration program that led to the development of the Ekati Mine. After discovery of the first kimberlite at Point Lake, which was followed by the subsequent identification of over 150 kimberlite bodies within the Ekati joint venture claim areas, the use of KIM geochemistry was adopted to prioritize likely high grade phases for follow-up bulk sampling and/or diamond drilling programs.

The method involves selecting representative samples, largely from diamond drill core material, and recovering a full suite of KIM's from each sample, in such a way as to eliminate selection bias. The recovered grains (garnet, chromite, ilmenite, clinopyroxene) were analyzed by electron microprobe for major elements and by inductively-coupled plasma mass spectrometry (ICPMS) for nickel.

The Mantle Mapper software, developed by Mineral Services, incorporates a scoring system that rates the potential for each of the two main diamond paragenesis found in kimberlites, i.e. peridotitic and eclogitic. The scoring system is based on the abundance of specific compositional varieties of garnet and chromite known to be associated with diamonds, refined by consideration of thermal information derived from nickel thermometry in conjunction with mantle geotherms based on peridotite xenolith and clinopyroxene thermobarometry. The Mantle Mapper data and scores were presented in an integrated format for final expert review and classification of each sample as A, B, C or D, reflecting the range from forecast high grade to essentially barren diamond content.

Concurrently with the KIM investigation, microdiamonds were recovered from separate samples of the same kimberlite units sampled for KIMs. Recovered diamonds were weighed and described, and samples were ranked based on the abundance, size distribution and quality of diamonds. In addition, the kimberlite units were described petrographically in terms of a carefully defined set of criteria to provide information on diamond carrying capacity. These assessments, along with other relevant economic factors such as size, location and internal geology, were integrated into overall prospectivity assessments.

Subsequent bulk sampling confirmed the validity of this approach. Of the kimberlite pipes that have been mined out (e.g. Panda, Fox open pit, Koala North, and Beartooth) or are currently being mined (e.g. Koala, Pigeon, and Misery), all economic units are categorised as A-rated or B-rated phases. A number of other pipes on the property with estimated Mineral Resources (e.g. Lynx, Sable, and Jay) also are uniformly categorised by strong KIM scores. Other pipes of interest with strong scores included Point Lake, Phoenix, Leslie, Cardinal, Gazelle, Impala and Pegasus. Small bulk samples taken at a few C and D rated kimberlites confirmed very low grades and validated the scoring system.

In addition to contributing to the early stage development of the Ekati Diamond Mine, the approach outlined in this contribution demonstrated at an early stage that some G10 type peridotitic garnets in mantle beneath the Slave Craton are too shallow to be in the diamond stability field, and that the peridotitic/eclogitic diamond source ratio in the kimberlites can vary widely.

Kimberlite pipes were selected for initial bulk sampling primarily based on microdiamond and indicator mineral analyses of the drill core or surface samples. In some cases, pipe perimeter outlines from ground geophysics provided a means for designing RC drill hole patterns to obtain representative initial bulk samples without the need for delineation core drilling.

The bulk samples (typically 50 to 200 t) were processed in a 10 tonne per hour dense media separation plant which was constructed on site.

Table 9-2 summarizes diamond drilling for pipes currently considered to possess exploration potential. Bulk sample results (RC drilling) and summary data of the exploration potential pipes are provided in Table 9-3. Figure 9-3 shows pipe locations.

Sample grades for the exploration pipes range from 0.1 cpt at Falcon East to 2.3 cpt at Piranha. The exploration potential of these pipes is influenced by a number of factors including diamond grade, diamond quality, internal kimberlite geology, pipe size, pipe location, setting and distance to infrastructure. Further work is warranted for a number of the exploration potential pipes, particularly the larger pipes and/or the kimberlites with high sample grades.

Table 9-2: Pipes with Exploration Potential – Diamond Drilling

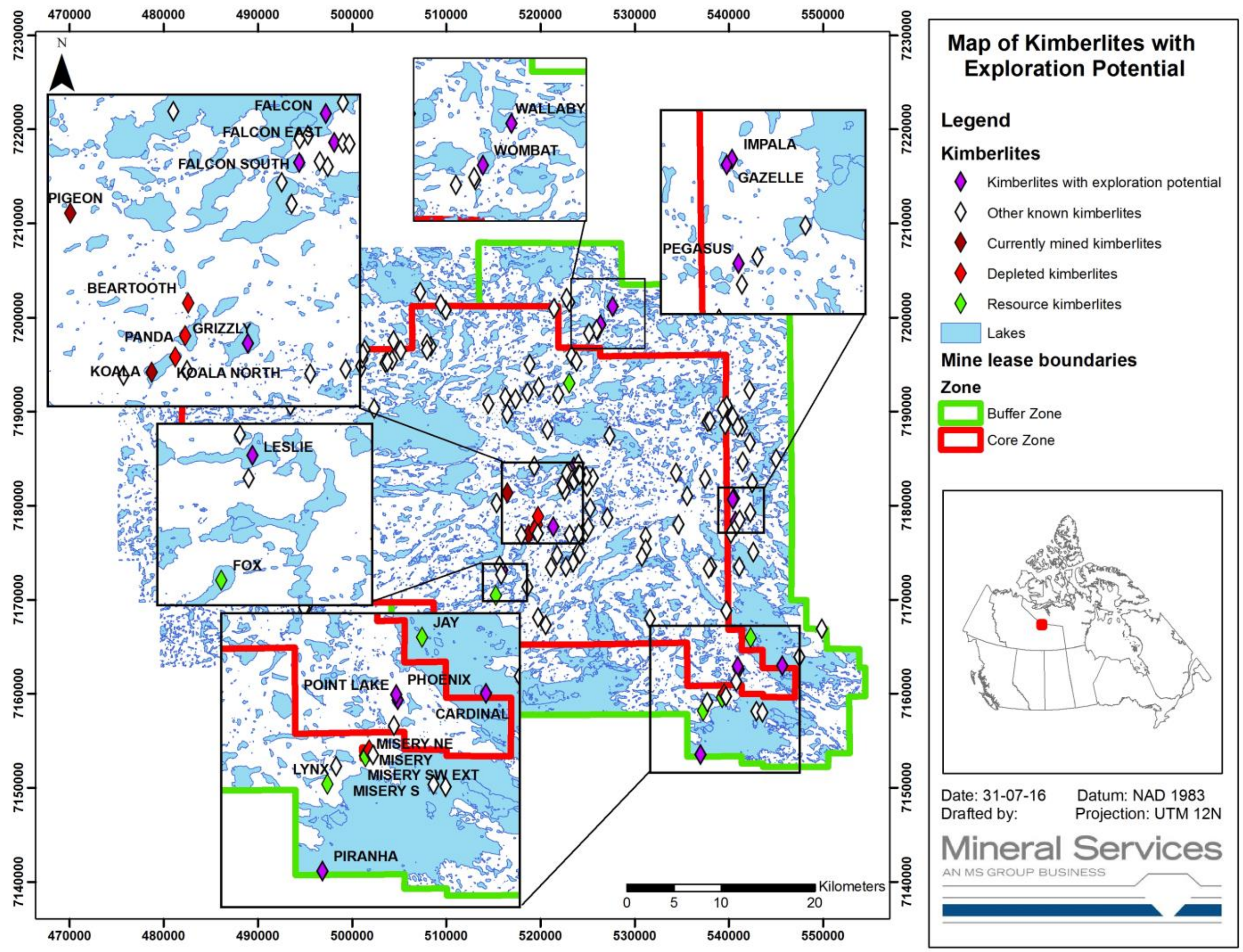
Pipe Name	Joint Venture	Year	Number of Drill Holes	Drill Hole Type	Total Metres Drilled (m)	Maximum Hole Depth (m)
Point Lake	Core Zone	1991	1	NQ core	280	198
		2006	1	NQ core	401	283
		Subtotal	*2*		*681*	*481*
Phoenix	Core Zone	1998	2	NQ core	675	262
		Subtotal	*2*		*675*	*262*
Leslie	Core Zone	1995	2	6" core	410	240
		1996	10	NQ core	2,548	432
		Subtotal	*12*		*2,958*	*672*
Grizzly	Core Zone	1992	1	NQ core	366	259
		Subtotal	*1*		*366*	*259*
Falcon	Core Zone	1992	1	NQ core	268	188
		1993	2	NQ core	523	255
		Subtotal	*3*		*791*	*443*
Falcon East	Core Zone	1993	1	NQ core	275	195
		Subtotal	*1*		*275*	*195*
Falcon South	Core Zone	1993	1	NQ core	327	231
		Subtotal	*1*		*327*	*231*
Cardinal	Buffer Zone	1999	3	NQ core	407	104
		2008	1	NQ core	251	251
		2014	3	NQ core	664	260
		Subtotal	*7*		*1,322*	*615*
Gazelle	Buffer Zone	1995	1	NQ core	328	231

Pipe Name	Joint Venture	Year	Number of Drill Holes	Drill Hole Type	Total Metres Drilled (m)	Maximum Hole Depth (m)
		1997	1	NQ core	400	283
		Subtotal	*2*		*728*	*514*
Piranha	Buffer Zone	1997	9	NQ core	1,621	264
		Subtotal	*9*		*1,621*	*264*
Impala	Buffer Zone	2001	1	NQ core	240	184
		Subtotal	*1*		*240*	*184*
Pegasus	Buffer Zone	2000	1	NQ core	194	137
		2001	3	NQ core	328	119
		Subtotal	*4*		*522*	*256*
Wallaby	Buffer Zone	1995	*2*	NQ core	506	323
		1997	1	NQ core	186	186
		Subtotal	*3*		*691*	*323*
Wombat	Buffer Zone	*1993*	*1*	NQ core	*424*	*424*
		2000	*1*	NQ core	*287*	*287*
		2005	*2*	NQ core	*814*	433
		Subtotal	*4*		*1,525*	*433*

Table 9-2: Pipes with Exploration Potential – Reverse Circulation Drilling

Pipe	Joint Venture	Size (ha)	Sample Year	Sample Type	Est. Dry Tonnes	Total Carats	Sample Grade (cpt)	De-grit Screen (mm)
Point Lake	Core Zone	13.0	1992	15 cm RC	160.0	101.0	0.6	1
			2006	35 cm RC	108.9	68.2	0.6	1
			Subtotal		268.9	169.2	0.6	1
Phoenix	Core Zone	1.4	1992	15 cm RC	8.3	15.1	1.8	1
			1999	35 cm RC	106.1	149.2	1.4	1
			Subtotal		114.4	164.4	1.4	1
Leslie	Core Zone	4.0	1993	27 cm RC	152.0	61.7	0.4	1
			1995	27–31 cm RC	679.5	223.6	0.3	0.5
			Subtotal		831.5	285.3	0.3	0.5 to 1
Grizzly	Core Zone	16.0	1993	27 cm RC	20.2	18.0	0.9	1
			1995	31 cm RC	139.0	66.6	0.5	0.5
			Subtotal		159.2	89.4	0.6	0.5 to 1
Falcon	Core Zone	15.0	1994	27 cm RC	280.7	92.7	0.3	1
Falcon East	Core Zone	0.8	1994	27 cm RC	181.2	18.0	0.1	1
Falcon South	Core Zone	1.8	1994	27 cm RC	15.9	17.3	1.1	1
Cardinal	Buffer Zone	0.8	2005	44.45 cm RC	70.8	65.2	0.9	1
			2007	44.45 cm RC	137.2	148.3	1.1	1
			Subtotal		207.9	213.5	1.0	1
Piranha	Buffer Zone	0.2	1999	35 cm RC	87.4	203.4	2.3	1
Gazelle	Buffer Zone	0.6	1999	35 cm RC	240.7	141.4	0.6	1
Impala	Buffer Zone	1.8	2002	35 cm RC	77.5	32.7	0.4	1
Pegasus	Buffer Zone	1.8	2002	35 cm RC	98.4	42.9	0.4	1

Figure 9-2: Exploration Potential Map



9.7 Comments on Exploration

In the opinion of the responsible QPs, the exploration programs completed to date are appropriate to the style of the kimberlite pipes within the Ekati Project. Significant exploration potential remains in the Ekati Project area, with 14 kimberlite pipes identified as potentially warranting additional evaluation.

10.0 DRILLING

Drilling completed on the Ekati Project between 1991 and 31 July 2016 is summarized, by pipe, in Table 10-1. Drilling includes 1,389 core holes (254,490 m), 111 sonic drill holes (2,596 m) and 513 RC holes (106,547 m).

A drill collar location map is included for the Ekati Project area (includes discovery drill holes and all follow-up drilling through 31 July 2016) as Figure 10-1, and an inset for the areas of much closer-spaced drilling is included in Figure 10-2.

Table 10-1: Drill Summary Table

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Aaron	Core Zone	1997	531,190	7,176,690	2	454	0	0
Alexis	Core Zone	1993	515,675	7,173,600	3	932	0	0
Anaconda	Core Zone	1996	502,350	7,190,290	1	222	0	0
Antelope	Core Zone	1995	538,030	7,188,970	2	260	0	0
Arnie	Core Zone	1992	532,960	7,177,000	0	0	8	622
Barbara	Core Zone	1997	522,730	7,173,480	1	127	0	0
Barracuda	Buffer Zone	1997	543,588	7,158,000	3	329	0	0
Beartooth	Core Zone	1996	519,750	7,178,855	71	12,750	19	3,057
Beaver	Core Zone	1993	516,750	7,191,600	1	136	1	108
Bighorn	Buffer Zone	2001	540,793	7,177,830	1	177	0	0
Bison	Buffer Zone	1995	542,290	7,179,220	1	353	0	0
Blackbear	Core Zone	1993	519,725	7,177,000	1	266	0	0
Boa	Core Zone	1996	505,170	7,196,475	2	294	0	0
Bobcat	Core Zone	2000	520,780	7,188,050	1	215	0	0
Brent	Core Zone	1994	530,800	7,174,540	1	209	0	0
Cardinal	Buffer Zone	1999	545,710	7,162,970	7	1322	5	920
Caribou	Buffer Zone	1993	541,430	7,188,400	1	158	0	0
Caribou West	Core Zone	1995	539,630	7,188,580	1	280	0	0
Centennial	Core Zone	2001	524,810	7,177,150	1	122	0	0
Chad	Core Zone	1999	531,180	7,175,380	3	513	0	0
Char	Buffer Zone	2001	517,350	7,162,720	1	178	0	0
Cheetah	Core Zone	1996	518,885	7,195,030	1	158	0	0
Cobra	Core Zone	1996	500,935	7,195,715	1	245	0	0
Cobra South	Core Zone	1996	501,119	7,195,653	1	142	0	0
Coral	Core Zone	2003	503,565	7,195,180	1	276	0	0

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Cougar	Core Zone	1999	520,206	7,192,798	1	164	2	505
Coyote	Core Zone	1997	516,310	7,191,525	1	139	0	0
Crab	Core Zone	1994	525,300	7,179,720	1	302	0	0
Crow	Core Zone	2001	525,080	7,177,670	1	163	0	0
Cub-1	Core Zone	1994	522,000	7,177,350	2	375	4	435
Cub-2	Core Zone	1994	523,125	7,176,900	1	252	0	0
Cub-3	Core Zone	1997	524,535	7,177,110	2	477	0	0
Darkwing	Core Zone	2000	523,391	7,182,771	2	476	0	0
Dingo	Core Zone	1997	514,490	7,190,800	1	258	0	0
Eagle	Core Zone	2007	540,825	7,161,250	2	634	0	0
Eel	Core Zone	2001	521,150	7,173,421	1	118	0	0
Elk	Buffer Zone	1995	541,480	7,184,650	2	631	0	0
Emu	Core Zone	1999	522,609	7,181,601	1	133	0	0
Falcon	Core Zone	1992	523,550	7,184,100	2	523	14	2,513
Falcon East	Core Zone	1993	523,790	7,183,300	1	275	5	1,224
Falcon South	Core Zone	1993	522,820	7,182,740	1	327	3	411
Falcon West	Core Zone	2000	519,350	7,184,160	1	198	0	0
Fifty	Buffer Zone	1995	540,940	7,181,505	4	992	0	0
Fisher	Core Zone	2000	523,313	7,195,905	1	225	0	0
Flamingo	Core Zone	1998	523,063	7,183,493	2	321	0	0
Flying V	Core Zone	1994	509,945	7,200,755	1	197	0	0
Fox	Core Zone	1992	515,270	7,170,420	143	29,924	86	21,487
Garter	Core Zone	1996	507,990	7,196,535	2	465	0	0
Gazelle	Buffer Zone	1995	540,430	7,180,660	7	1,769	7	1,375
Giraffe	Buffer Zone	1998	542,240	7,186,690	2	479	5	1,007
Glory	Buffer Zone	1996	542,970	7,156,550	2	315	1	315

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Grizzly	Core Zone	1992	521,400	7,177,740	1	366	5	1,007
Hawk	Core Zone	1992	535,580	7,181,030	4	790	0	0
Horseshoe	Core Zone	2000	527,122	7,178,708	1	213	0	0
Hugo	Buffer Zone	1997	549,890	7,166,880	1	240	0	0
Husky	Core Zone	1994	516,005	7,191,375	1	148	4	146
Hyena	Buffer Zone	1999	539,800	7,190,630	2	240	0	0
Impala	Buffer Zone	2001	540,561	7,180,793	1	240	2	455
Jaeger	Core Zone	1992	539,770	7,168,840	7	1,627	0	0
Jaguar	Buffer Zone	1999	523,075	7,201,615	1	258	0	0
Jay	Buffer Zone	1993	542,330	7,165,950	75	10,864	25	7,371
Kanga	Buffer Zone	1999	526,000	7,198,700	2	298	0	0
Kaska	Core Zone	1993	527,350	7,187,405	2	279	0	0
Kaspa	Core Zone	2000	522,830	7,183,390	1	151	0	0
Kathy	Core Zone	1997	520,590	7,167,275	2	356	0	0
Kestrel	Core Zone	2000	534,416	7,183,460	2	309	0	0
Kia	Core Zone	2007	515,865	7,172,650	1	242	0	0
Kit	Core Zone	1997	516,595	7,191,575	0	0	2	182
Koala	Core Zone	1992	518,750	7,176,950	282	47,322	49	11,002
Koala North	Core Zone	1996	519,400	7,177,365	71	8,017	6	1,236
Koala West	Core Zone	1997	517,975	7,176,850	3	502	0	0
Kodiak	Core Zone	2000	524,000	7,175,100	3	261	0	0
Kodiak South	Core Zone	2003	524,204	7,174,870	1	288	0	0
Kokanee	Core Zone	2002	538,144	7,173,493	1	21	0	0
Kudu	Core Zone	1995	540,460	7,189,460	2	315	0	0
Lemming	Buffer Zone	1997	523,858	7,195,311	1	258	0	0
Leopard	Core Zone	1997	517,380	7,191,300	1	203	0	0

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Leslie	Core Zone	1992	515,950	7,173,150	12	2,957	20	4,810
Lioness	Core Zone	2002	534,681	7,178,000	0	0	1	66
Llama	Core Zone	1997	537,510	7,182,830	1	145	0	0
LS-1	Buffer Zone	1997	546,400	7,161,120	3	393	2	330
LS-2	Buffer Zone	1993	547,520	7,163,880	1	154	0	0
Lynx	Buffer Zone	1999	537,300	7,158,140	27	3,121	16	2,340
Mamba	Core Zone	1996	507,975	7,197,205	1	222	0	0
Mandarin	Core Zone	2000	523,606	7,182,625	2	198	0	0
Mantaray	Core Zone	2001	523,464	7,173,964	4	580	0	0
Mark	Core Zone	1993	531,210	7,175,690	0	0	2	464
Medusa	Core Zone	2000	501,341	7,196,560	1	276	0	0
Misery East	Core Zone	1993	539,715	7,159,690	138	29,805	0	0
Misery Main	Core Zone	1993	539,430	7,159,840			45	8,829
Misery Northeast	Core Zone	2003	539,526	7,159,960			0	0
Misery South	Core Zone	1993	539,540	7,159,725			7	956
Misery Southeast	Core Zone	2003	539,320	7,159,580			0	0
Misery SW Extension	Core Zone	2002	539,485	7,159,783			0	0
Mongoose	Core Zone	1997	500,921	7,194,584	1	267	0	0
Moose	Core Zone	1996	516,510	7,189,745	1	175	0	0
Mustang	Buffer Zone	1995	542,640	7,175,040	1	167	0	0
Nancy	Core Zone	1995	515,380	7,180,260	2	383	0	0
Nanuk	Core Zone	2000	521,480	7,200,965	2	352	0	0
Nora	Core Zone	1994	514,685	7,167,655	2	562	0	0
One Fifty	Core Zone	2002	537,790	7,188,875	1	99	0	0
Osprey	Core Zone	1997	524,200	7,183,260	1	203	0	0
Ostrich	Core Zone	1998	525,570	7,182,900	1	261	0	0

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Palomino	Buffer Zone	1997	545,060	7,184,970	1	152	0	0
Panda	Core Zone	1993	519,665	7,177,950	137	23,002	36	8,365
Panther	Core Zone	1995	521,925	7,191,800	2	347	0	0
Peacock	Core Zone	1998	524,030	7,184,400	1	295	0	0
Pegasus	Buffer Zone	2000	540,710	7,178,327	4	522	2	534
Peregrine	Core Zone	1997	524,027	7,183,291	1	173	0	0
Phantom	Buffer Zone	1999	537,750	7,159,085	3	494	0	0
Phoenix	Core Zone	1998	540,950	7,162,900	2	675	14	1,213
Pigeon	Core Zone	1994	516,500	7,181,350	68	11,487	36	7,662
Pinto	Buffer Zone	2001	540,255	7,177,010	1	148	0	0
Piranha	Buffer Zone	1997	537,030	7,153,500	10	1,673	2	476
Point Lake	Core Zone	1991	541,030	7,162,620	2	681	27	4,519
Python	Core Zone	1996	503,760	7,195,290	1	252	0	0
Rat	Core Zone	1994	501,490	7,173,500	2	626	0	0
Rat East	Core Zone	2005	501,590	7,173,500	1	163	0	0
Rattler	Core Zone	1996	501,142	7,196,155	1	259	0	0
Raven	Core Zone	1998	524,976	7,181,978	1	188	0	0
Redwing	Core Zone	2007	523,330	7,182,470	1	190	0	0
Roger	Core Zone	1994	521,780	7,174,700	1	273	0	0
Ronza	Core Zone	2000	508,361	7,196,930	1	297	0	0
Roo	Buffer Zone	1995	526,045	7,198,575	2	266	0	0
Sable	Core Zone	1995	523,090	7,193,025	38	9,197	41	9,248
Scorpion	Core Zone	1995	531,620	7,167,990	1	325	0	0
Shark	Buffer Zone	1997	542,930	7,158,120	4	744	3	154
Sheiba	Core Zone	2002	537,890	7,173,303	1	47	0	0
Shrew	Core Zone	1997	518,640	7,192,005	1	213	0	0

Kimberlite Locality Name	Property	Discovery Year	Easting UTM	Northing UTM	Core # of Holes	Total Meterage	RC # of Holes	Total Meterage
Smokey	Core Zone	1997	524,096	7,177,034	1	196	0	0
Sparrow	Core Zone	1994	524,860	7,183,135	1	248	0	0
Springbok	Core Zone	1995	539,390	7,190,240	1	97	0	0
Stallion	Buffer Zone	1999	541,120	7,173,470	1	141	0	0
Sue	Core Zone	1996	518,650	7,171,325	1	325	0	0
Taz	Buffer Zone	1995	525,165	7,198,350	3	781	0	0
Tiger	Core Zone	1996	519,860	7,192,610	1	145	0	0
Ursa	Core Zone	1996	519,860	7,178,128	1	276	0	0
Viper	Core Zone	1996	504,255	7,195,430	2	288	0	0
Vulture	Core Zone	1993	522,340	7,182,200	1	289	0	0
Wallaby	Buffer Zone	1995	527,685	7,201,165	3	691	0	0
Wapati	Buffer Zone	1999	540,950	7,188,310	1	306	0	0
Waterbuck	Buffer Zone	2000	542,230	7,192,265	1	172	0	0
Whitetail	Buffer Zone	1995	542,490	7,182,375	1	249	0	0
Wildcat	Buffer Zone	1999	522,805	7,202,065	2	397	0	0
Wildebeast	Buffer Zone	2000	540,489	7,178,218	3	419	2	244
Wolf	Core Zone	2001	519,765	7,168,085	1	64	0	0
Wolverine	Core Zone	1998	521,288	7,176,855	3	629	3	679
Wombat	Buffer Zone	1993	526,400	7,199,250	4	1,527	0	0
Zach	Core Zone	1996	529,700	7,172,100	3	894	1	280
Zebra	Buffer Zone	1995	541,160	7,178,480	2	231	0	0
N/A (no intersection)	Combined	n/a	n/a	n/a	97	19,058	0	0
	Totals				*1,389*	*254,490*	*513*	*106,5378*

Figure 10-1: Ekati Project Drill Collar Location Map

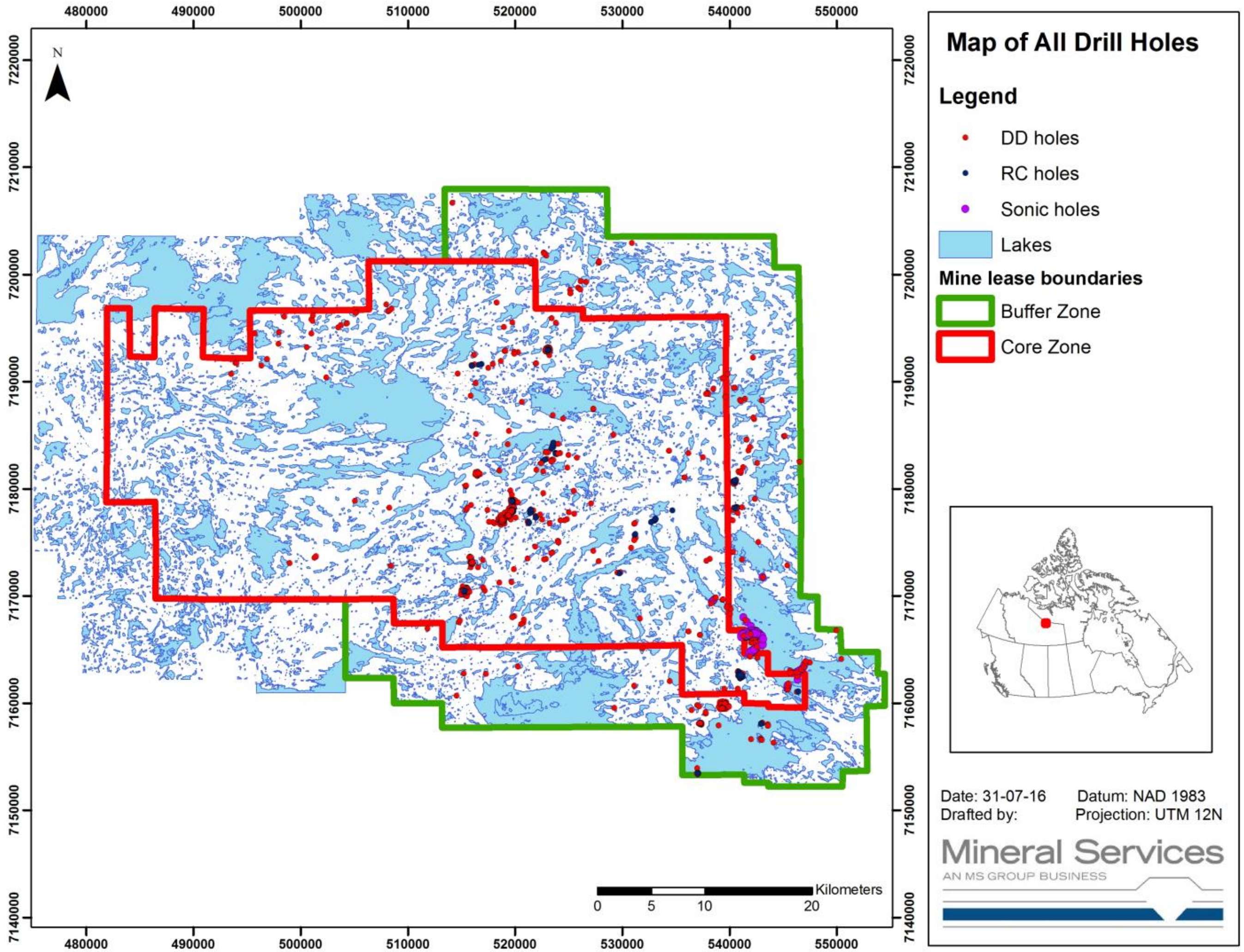
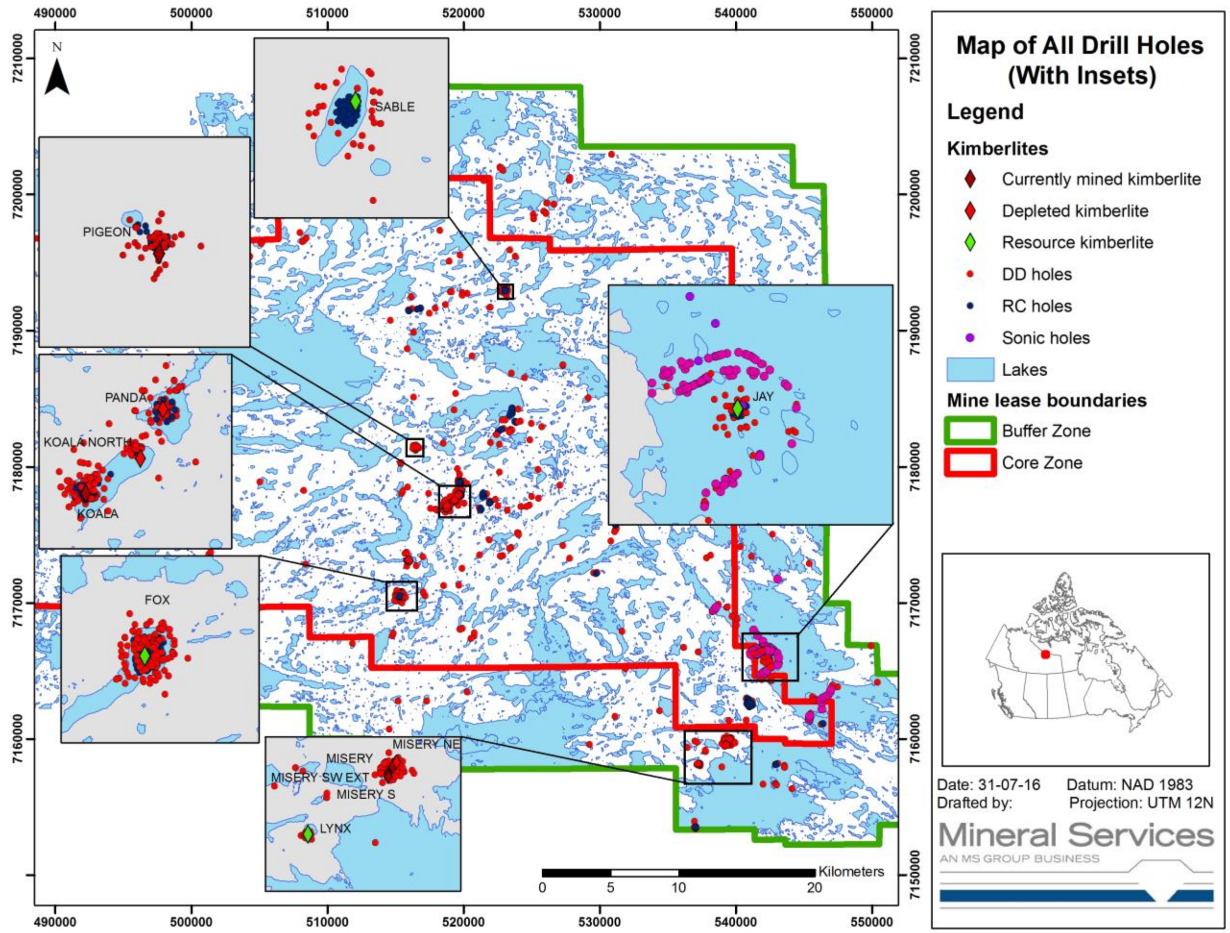


Figure 10-2: Map Showing Location of All Drill Holes With Insets for Pipes with Reported Mineral Resources



Drill hole collars and orientations for drilling completed on the kimberlite pipes that have resource estimates is included in the figures for each pipe in Section 7 of this Report.

10.1 Drill Methods

Core drilling is used to define the pipe contacts, wall-rock conditions, and internal geology but is not used for grade estimation. Core drilling is also used to obtain geotechnical and hydrogeological data.

Sonic drilling is used to core both soil and bedrock along proposed civil construction projects such as dike alignments. The primary objective of sonic drilling is to characterize the nature and variation of the soil layers beneath the proposed civil work and to determine the depth to bedrock. Recovered soil is geotechnically logged and geotechnical laboratory testing is performed on selected samples.

Diamonds for grade estimation and valuation are obtained by one or a combination of RC drilling, bulk sampling, and sampling of kimberlite in active underground and open pit exposures. Samples are processed through an on-site sample plant.

10.1.1 RC Drilling

Kimberlite pipes with demonstrated potential, based on initial evaluation and delineation work, are tested for commercial size diamonds by means of vertical large-diameter RC drill sampling. In most cases, RC drilling is undertaken during winter from the frozen lake surface. This approach was selected as the most cost effective means of obtaining a spatially representative, adequately-sized sample of the kimberlites, most of which occur under lakes and are, therefore, not readily accessible to surface excavation.

The diameter of drill holes employed prior to 1995 ranges from 27 to 71 cm, but from 1995 to 2008, the hole diameter was standardized to between 31 and 45 cm. The 2015 and 2016 winter drilling programs used large diameter drilling (LDD) in order to obtain larger samples. Drill hole diameters for the 2015 and 2016 programs ranged from 45 to 61 cm.

Following initiation of mining, evaluation work continued with RC drilling, typically from within the open pit. This generated critical data for evaluation of the lower portions of the ore bodies that are less accessible to drilling from surface and permitted drilling of large diameter RC holes providing improved spatial resolution of grade data (smaller sample intervals corresponding to planned benches or levels). The latter is particularly important where significant vertical changes in geology and/or diamond grade occur over scales of less than 30 m (e.g. Koala).

The initial drill pattern for an RC program was planned to maximize both vertical and horizontal sample coverage. Planned drill hole collar locations and depths were designed to reach a maximum depth within kimberlite while giving maximum lateral spread.

Diamonds are not typically added to the samples (no spikes used). Security procedures are in place to ensure very limited access to the sample collection areas. Additionally, sample plant audits are undertaken to verify the recovery process.

10.1.2 Core Drilling

Core drilling using synthetic diamond-tipped tools and/or carbide bits is used to define the pipe contacts, wall-rock conditions, and internal geology. An initial drill pattern around each pipe is completed, and depending on the results, additional drilling may be required to further delineate potential problem areas.

Core drilling used standard core barrels, and synthetic diamond or carbide bits, reaming shells, and casing shoes. Hole diameters used to date include HQ (63.5 mm core diameter), NQ (46.7 mm) and BQ (36.5 mm).

Oriented core is used for geotechnical investigation of the wall rocks, and is not employed in kimberlite. Orientation tools include clay imprint, ACT tool, and optical/acoustic televiewing.

10.1.3 Sonic Drilling

Sonic drilling was used to core both soil and bedrock along the proposed Jay dike alignment at part of the geotechnical site investigations to support dike design. Sonic drilling was used to core and sample the Jay kimberlite pipe.

The primary objective of the sonic drilling is to characterize the nature and variation of the soil layers beneath the proposed dike and to determine the depth to bedrock. Recovered soil is geotechnically logged and geotechnical laboratory testing is performed on selected samples.

The sonic drilling method uses relatively high frequency mechanical vibration, down-pressure and optional rotation to advance an inner drill string and an outer casing. A one-piece core barrel with a 150 mm diameter is threaded onto the bottom of the inner drill string and obtains samples. The core barrel and outer casing are advanced by fracturing, shearing and/or displacing the formation materials. Resonant frequency within the drill string and outer casing allow the inertia of the drill bit and casing shoe, respectively, to fracture relatively hard materials. In relatively soft formations, it is possible to advance the drill string and casing using down-pressure alone.

When drilling through sediments and glacial till, the drill string and outer casing are advanced independently. The drill bit face on the core barrel is advanced approximately 1.5 m below the outer casing shoe using down-pressure, vibration and/or rotation. The outer casing shoe is then advanced to approximately 0.3 m above the drill bit face using down-pressure, vibration, rotation and water flushing to avoid trapping material between the core barrel and the outer casing. The core barrel and drill string are retracted from the outer casing to bring the core barrel sample to the surface. A hole rod (a drill rod with a drainage hole) is installed above the core barrel to drain water from the drill rods during core barrel retraction. Core barrel samples are then extruded into plastic liner bags that are supported by aluminium sample trays. A plastic core catcher is generally installed within the core barrel when advancing through the sediment and glacial till materials.

A wet coring method is used when drilling into bedrock materials and through suspected boulders. The hole rod is replaced with a standard rod and the core barrel is advanced using vibration, rotation and water flushing to cool the drill bit. Once the drill bit is advanced below suspected boulders the hole rod is re-installed and water flushing during coring will be stopped. Where bedrock is encountered, wet coring is used to advance the core barrel approximately 2 m into the bedrock formation.

After reaching the final depth of investigation at each borehole location, in-situ hydraulic conductivity testing is carried out. This may be carried out using a downhole packer system or with the temporary installation of a standpipe piezometer. Once this testing is completed, the packer or the temporary standpipe are removed from the bore hole. A cement-bentonite grout is placed in each borehole before retracting the outer casing.

10.2 Geological Logging

10.2.1 RC Drilling

A small sub-sample (approximately 300 cm^3) of RC drill material (drill chips) is taken for every two metres of drilling within kimberlite and a representative portion of this material (approximately 50 to 100 cm^3) is washed and retained. The drill chips are examined and described macroscopically and under binocular microscope. As the drill sample consists of small rock fragments and drill fines, RC chip logs are less precise than those obtained from core logging. Dominion staff consider that an accuracy of approximately ±1 m is possible when combining chip geology with downhole geophysical logs.

10.2.2 Core Drilling

Core drill holes are logged in detail by trained kimberlite geologists and/or by trained geotechnical consultants. Geological logging is undertaken on a 1:100 scale using logging sheets specifically developed for the Ekati Diamond Mine. Digital geological and geotechnical logging is completed and the core is photographed before being stored in the attached unheated core storage building.

Geological logging utilizes a digital logging form for both wall-rock lithology, kimberlite/wall-rock contacts, and internal kimberlite lithology. Wall-rock is logged by rock-type, mineralogy, alteration, rock strength, and major structures. Kimberlite core is examined macroscopically and using a binocular microscope to determine the following key lithological parameters on 5 m intervals, or following lithological breaks: concentration of macrocrystic olivine, matrix composition, abundance and type of country-rock xenoliths, approximate abundance of indicator minerals, rock fabric, colour, and alteration.

Kimberlite lithologies are classified according to a kimberlite classification scheme standard to the industry.

Colour photographs are taken of delineation drill core and used to verify significant contacts and lithologies as well as provide a permanent record of the drill core. These photographs are annotated with the unit names and lithological contacts.

10.3 Recovery

Within wall rock, typical recoveries are 95 to 100% for both core and RC drill holes. In kimberlite, the core recoveries can be as low as 20% and as high as 95%, but are more typically in the 75 to 85% range. For RC drill holes, kimberlite recoveries may range from 50% to over 100% in cases of in hole sloughing. The recovery is largely a function of the hardness of the kimberlite.

10.4 Collar Surveys

10.4.1 RC Drilling

All RC drill hole collars are surveyed using a real time global positioning system (RTGPS) instrument prior to and after drilling; these have an accuracy of ±10 mm. Ekati staff consider that the drill hole collar location error is minimal.

10.4.2 Core Drilling

All surface core hole collar positions are surveyed using a RTGPS, providing an accuracy of ±0.01 m. Hole collar, dip and azimuth are verified by surveying the top and bottom of the in-hole drill steel and then calculating the initial azimuth and dip of the hole at surface.

10.5 Down-hole Surveys

10.5.1 RC Drilling

Three Century Wireline Services tools, including the "9095" tool (for gyroscopic deviation surveying); the "9065" tool (three arm calliper); and the "9511" tool (conductivity induction and natural gamma), are used on all RC holes:

- Gyroscopic deviation: used to incrementally (usually in 3 m intervals) measure drill hole deviation from vertical and provide azimuth and dip determinations;
- Three arm calliper: provides a measure of hole diameter for determining sample volumes. Run up the open holes directly after the drill steel is removed from the hole, the arms are spring loaded and press against the sides of the open drill hole. Repeat runs indicate that the data are repeatable and that the data have an accuracy of approximately 1 cm. The calliper is calibrated against the known casing diameter. The minimum reach of the calliper is the hole diameter and the maximum reach is 220 cm (89") to 241 cm (95") depending on the model;
- Natural Gamma: measures the amount of naturally occurring gamma radiation from potassium, uranium, or thorium sources approximately every 2 cm. In the case of many Lac de Gras kimberlites, the principal source of gamma radiation is potassium feldspar in granitoids or potassium ions in non-kimberlitic clay. The gamma logs are particularly useful for determining the location of the water and sediment interface in lakes, the location of the overburden and kimberlite contact, and the location of Phanerozoic sedimentary rock or country-rock boulders in kimberlite;
- Conductivity Induction: measures conductivity a few centimetres into the drill hole wall approximately every 2 cm and is an index for clay content. Clay content decreases from RVK to olivine-rich ORVK to PVK, and therefore conductivity increases and these rock-types can be discerned.

Down-hole directional surveys of RC holes are performed using a gyroscopic instrument.

10.5.2 Core Drilling

Downhole surveys were done with one of four survey instruments: EZ-shot, Lightlog, Maxibor, or Century Geophysics 9096 Gyroscope. Currently, only Maxibor and gyroscope are used as they proved to be the most consistent. Some testing has been done and the two methods produced almost identical results for the same drill hole.

The maximum error in the drill hole location for holes less than 100 m long is about 1 m, while the locations of longer holes (100 to 600 m) are accurate to within approximately 1 m per 100 m drilled over the entire length of the drill hole.

In 2004, survey precision and accuracy was tested by coring two holes of significant length (300 m) collared by the surface surveyors to target an underground heading location provided by underground surveyors. Both holes resulted in absolute error of less than the anticipated +3 m of error when they breached the underground workings. This validated the surface and underground location surveys of two discrete points (drill and drill target), and indicated that the down-hole deviation surveys are providing useable modelling data.

Previous mining has intersected old large diameter drill holes (open and grouted) which have been used to validate and confirm the drill hole survey. When drill holes are encountered in the UG mine, the intersection is surveyed using DGPS and compared to known drill holes in the area to determine which drill hole was intersected. There are no known instances where surveyed intersections did not closely coincide with down-hole drill hole surveys.

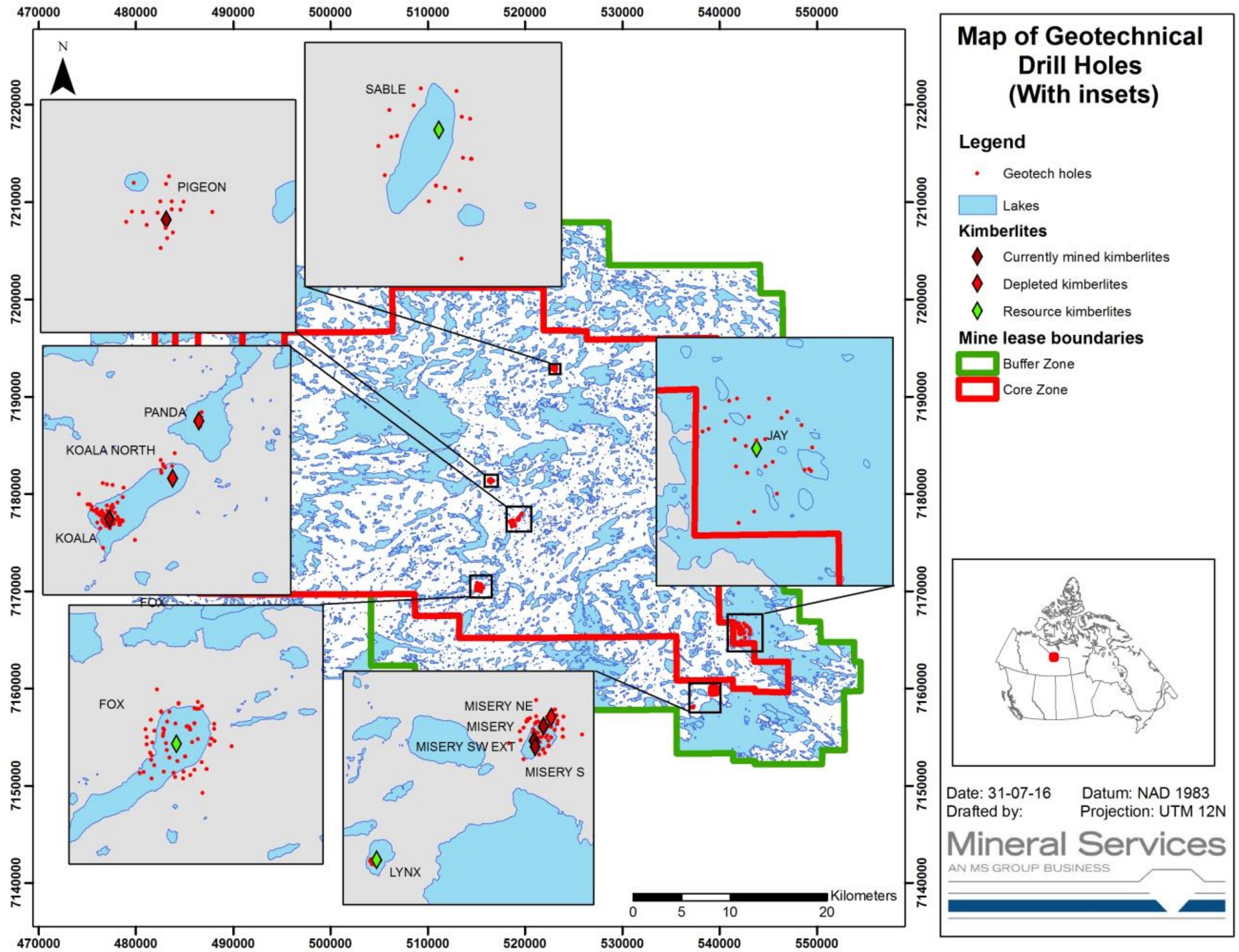
10.6 Underground Test Hole Data

During the development phase of each underground level, test holes to probe the ore /waste rock contact are routinely drilled with the Tamrock Solo long hole drill in order to provide additional production scale ore body delineation. The test holes (flat and down holes) improve ore/waste contact definition to an ideal density of one hole per 12 m.

10.7 Geotechnical Drilling

The locations of the drill holes completed specifically for geotechnical purposes are shown in Figure 10-3.

Figure 10-3: Geotechnical Drill Hole Location Plan with Insets



Geotechnical logging of core from core holes was completed to determine rock mass rating (RMR) according to the Laubscher system. For key holes, core is oriented using an ACT (ACE) tool, and detail structural logging was completed. In 2009, an acoustic and optical televiewer system was introduced to augment the structural logging program in waste rocks at the Misery pipe.

The following geotechnical parameters were determined for all core drill holes.

- Percentage core recovery;
- Rock quality designation (RQD);
- Fracture frequency;
- Point load strength index;
- Joint condition and water.

Rock samples are collected following a core drill core sampling procedure and are occasionally shipped for off-site testing at an accredited third-party materials testing facility. Strength index testing included the following: unconfined compressive strength (UCS), triaxial strength, direct strength, shear strength, Poisson's ratio, and Young's modulus evaluation.

Measurements suitable for pit wall stability study were obtained with an oriented core device to provide information on the orientation of joints, faults, bedding planes and other structures. A clay print device was used. An eccentrically-loaded core barrel was packed with modelling clay at the bottom, dropped down the hole, and an imprint of the core stub was recovered. The clay imprint was matched to the top of the core for the run and a reference line is scribed down the entire length of the core. The orientations of planar features were determined with reference to the scribe line and the core axis.

The geotechnical logs and data are recorded on paper logging sheets, captured and verified digitally into Excel spreadsheets and made available for required geotechnical review.

10.8 Sample Length/True Thickness

The kimberlite bodies are typically pipe like with near-vertical contacts with the host rock. Thus, the relationship between the drill hole angle and true thickness of the kimberlite is not relevant. Grade sampling is generally done using vertical RC drill holes. The RC drill holes have gyroscopic surveys to adjust for horizontal deviation.

10.9 Drill Data by Major Kimberlite

10.9.1 Koala

Since 1992, a total of 268 drill holes have been completed at the Koala pipe, including 48 RC holes, 145 surface core holes and 75 underground core holes.

The discovery NQ hole was drilled into Koala in August 1992. The core was analysed for microdiamonds and the positive results prompted planning of a bulk sample program. Seven RC drill holes were completed by Specialty Drilling Services (SDS) during the winter of 1993. The results indicated that the pipe had strong economic potential but was characterised by multiple geological units with variable diamond content.

Two core drilling programs followed in 1993 and 1994 to provide metallurgical samples for process plant design work, the correlation of diamond grade with geological domain, pipe delineation, and bulk density measurements.

The preliminary bulk sample results indicated grade variation associated with geological domains. Reverse circulation drilling programs were thus selected over underground methods for subsequent bulk sampling programs at Koala. Additional RC and core drilling programs were conducted in 1994 and 1995. These programs produced the first core hole intersections and grade results in the deeper Phase 6 portion of the pipe. The 1994–1995 drilling campaigns also provided adequate resource data to complete an open pit mine plan and indicated that the deeper portion below the planned pit bottom had strong economic potential.

Four core holes were drilled in each of 1997 and 1998. During 2002, 10 RC holes were drilled from the Koala pit from elevations ranging from 2,390 m to 2,360 m. These holes were designed to bulk sample both the open pit and underground resources. Also in 2002, 50 core holes were drilled to improve the definition of the Koala pipe model mostly within the zones of the open pit. The deep core holes provided additional pierce points for a conceptual resource model. However, none of the 2002 RC holes successfully sampled the targeted PVK unit at depth.

A follow-up drilling campaign was carried out in summer 2003 after open pit mining had lowered the collar elevation from 2,300 m to 2,290 m. Pilot core holes were completed at the proposed deep drill hole locations providing lithological control and granite xenolith locations prior to the RC drilling. Four deep RC holes (17.5” diameter) were subsequently completed yielding significant grade data. The drilling of an additional 39 core holes in 2003 further improved the definition of the Koala pipe model and allowed for a more detailed definition and evaluation of the phases in both the remaining open pit and underground resource estimate areas.

An underground core drilling program was undertaken in conjunction with the Koala feasibility bulk sample program to acquire additional geological and geotechnical data and for a test of the down hole seismic method. The drilling was immediately met with drilling and logistical challenges which resulted in achieved drill rates less than half of the predicted rates. As a result, approximately 40% of the holes did not penetrate through to the far side (southwest) of the pipe.

The core drilling program was extended to July from April 2005 and finally an in-pipe program from the 2050 bulk sample drift was added to acquire wall intersections on the far side of the pipe. The in-pipe drilling also proved to be difficult. Nevertheless, the program added 90 new pipe wall intersections to the database. The average drill hole intersection spacing for the main portion of the Koala underground resource was improved to 41 m on average. Drill spacing is appreciably closer on the northeastern side of the pipe than on the southwestern side.

An underground core drilling program was undertaken in May and June 2015 from ore storages on the Koala 1810 level. The focus of the program was to define kimberlite contacts between the 1810 level and proposed levels at 1770 and 1790. Additional data included refinement of Phase6/Phase 7 contacts and collection of microdiamond samples for grade estimation. Ten holes were drilled totalling 844 m.

All surface drill hole collar positions were surveyed using differential GPS methods. Down hole surveys were carried out with one of four survey instruments, either an EZ-shot, Light log, Maxibor, or gyroscope. The majority of the drill holes utilised Maxibor or gyroscope for the down hole surveys. Underground core holes were surveyed by Procon contract surveyors using either a Leica PCR703 or Trimble S6 reflectorless electronic total station instrument.

A combination of diamond drilling and test probe drilling has been carried out through the life of the Koala mine to further define internal geology and pipe wall contacts. The data have been used to inform the geological block model for periodic model revisions.

10.9.2 Fox

Discovery hole 92-01 (NQ core) was drilled in 1992. The first bulk sampling campaign was conducted in late February and March of 1993 with eleven 10⅝” (26.99 cm) RC holes.

As a result of this sampling, a decline was collared in September 1993. The decline was drifted through 1,395 m of granite before entering the kimberlite on May 6, 1994. Within the granite portion of the decline, 14 remuck bays, 42 safety bays, three drill stations and two transformer bays would approximately equate to an additional 220 m of drifting. The kimberlite portion of the decline was completed with 99 rounds equalling 301 m, bringing the total length of the decline to 1,697 m. As with the granite portion, remuck bays, safety bays and drill stations were also a part of the kimberlite drifting. The additional drifting of one remuck, one drill station and three safety bays in kimberlite approximately equate to 35 m. The volume of the kimberlite portion was measured to be 3,708 m^3, including additional drifting. Within the pipe, 422 m^3 of granite was encountered.

Two raises were started in early November 1994. Raise #1 followed the same path as core hole FUC3-2 for a length of 56 m and an approximate volume of 179 m^3. Raise #2 was located at the end of the decline and followed core hole FUC4-9. Total length and approximate volume were 51 m and 155 m^3, respectively.

Concurrently with drifting, delineation drilling began in March 1994 from surface. Seven HQ and NQ holes were drilled with only one successful entry into the diatreme. An underground BQ core rig was mobilized in April 1994 and pipe delineation from underground began. Two drill stations were utilized in the granite and five hole were drilled with four kimberlite intersections. The drill was then moved into the first drill station in the kimberlite. With one drill hole in this station, it became apparent that a larger rig would be necessary. An HQ rig was mobilized in early August 1994 at the completion of the drifting. Eleven holes were drilled, eight of which intersected the pipe/wall rock contact. Two raises, following two upward drill holes, were started in early November 1994. Raise #1 and Raise #2 were 56 m and 51 m in length, respectively. Four 12¼" (31.12 cm) RC holes were drilled in the 1995 winter drilling program to provide infill information and correlation of grade to the raise and decline bulk samples.

In 2000, five 13.75" RC holes were drilled during a 1,200 m program to explore the potential of the crater kimberlite and upgrade the diatreme kimberlite grade model. A first pass program to drill geotechnical holes perpendicular to the pit wall and third pass delineation program of the pipe wall was completed with 5,400 m of HQ/NQ drilling in 2001.

In 2004 and 2005, 61 additional 13.75" RC holes (14,694 m) were drilled to significantly improve the pipe grade model.

In the winter of 2016, three additional 17.5” to 24” RC holes (1,522 m) were drilled to extend and improve the grade model for Fox Deep. The samples were in process at the Saskatchewan Research Laboratory (SRC) as at 31 July 2016.

From 2004 to the Report effective date, 56 core holes (11,966 m) were drilled for internal geology and pipe wall definition.

10.9.3 Misery

RC drilling programs were completed at Misery Main in 1994, 1995, and 2008. The 1994 winter drilling program utilized small diameter drill holes (30 m down hole sample composites) and the drill holes were not callipered. The grade and valuation data indicated the high potential of Misery. These data are excluded from the grade model due to poorly-constrained sample sizes.

The drill holes were gyroscopically surveyed and calliper surveyed where possible; however due to significant hole caving, calliper surveys were difficult to obtain and in many cases, not reliable at depth. The 1995 sample intervals were processed at Koala Camp pilot plant with 0.5 mm slot de-grit screens in order to allow for evaluation of small diamond potential. Samples were then sieved to 1 mm.

The 2008 sample intervals were processed at the Ekati sample plant with 1.2 mm slot de-grit screens which is the current main process plant screen aperture. Samples were sieved to 1 mm.

The raw grade data were adjusted using partition data for estimating recovery at 1.0 mm slot and 1.2 mm slot screen sizes for comparison with the main process plant. Four RC drill holes were drilled in 2008 to provide additional grade data in deeper portions of the pipe. The drill holes were down hole surveyed and callipered; however, again calliper surveys were difficult to obtain. The RC sample intervals were processed at the Ekati sample plant using a 1.2 mm slot.

During 2013, a total of seven diamond drill holes for 929 m were completed within the Misery pushback open pit for pipe wall definition and microdiamond sampling of the Misery satellite pipes.

From the discovery drill hole in 1993, through December 2014, a total of 134 core holes for 29,577 m were completed at Misery Main primarily for pipe definition and geotechnical purposes.

No additional core drilling has been completed at Misery Main since December 2014.

10.9.4 Misery Satellites

Mineral Services were retained to perform an updated Mineral Resource estimate for the Misery South and Misery Southwest Extension areas. Information from that work is summarized in this section.

Thirty-five diamond drill holes have intersected Misery South and Misery Southwest Extension in drilling campaigns conducted in 1993, 1997, 2001, 2002, 2003, 2008, 2009, 2010 and 2014. Current diamond drilling provides sparse coverage of Misery South and Misery Southwest Extension to approximately 150 masl, below which there are virtually no constraints on the pipe shell position. Misery South was sampled during RC drilling campaigns in 1994 and 1995; however, the grade data were not deemed adequate to support Mineral Resource estimation.

10.9.5 Pigeon

Since the discovery core hole was drilled in 1994, a total of 104 drill holes have been completed at Pigeon including 68 diamond drill holes (11,487 m) and 36 RC drill holes (7,662 m).

The NQ-diameter discovery hole in August 1994 was analyzed for microdiamonds and positive results prompted a preliminary RC drilling program in 1995. Three 13.75" diameter drill holes (885 m) were completed in winter 1995.

A follow-up diamond drilling program (two drill holes) was carried out in 1997 for delineation purposes. In winter 1998, twelve 15.5" diameter RC drill holes were completed (3,000 m). A geotechnical drilling program (diamond drill holes) was completed in 2003 consisting of 10 drill holes for 2,138 m.

Larger-scale geological diamond drilling programs were completed in 2006 and 2007, with completion of 38 drill holes totaling approximately 6,100 m. RC drilling programs were also carried out in 2006 and 2007. Both programs utilized 19.75" diameter drill holes. The 2006 program focused on the main lobe (16 drill holes totaling 3,028 m) and the 2007 program was located on the northwest lobe (four drill holes totaling 727 m). A total of 309 bulk samples were collected from all of the RC drilling, of which 269 samples were considered valid for grade modeling.

In 2012, a diamond drilling program was completed including four drill holes for upper pipe delineation (410 m) and eight geotechnical drill holes (1,370 m). In 2015, two geotechnical diamond drill holes (400 m) were completed to assist with pit design.

10.9.6 Sable

Since 1995, a total of 71 drill holes have been completed at Sable Pipe, including 33 RC holes and 38 diamond drill holes.

The NQ-diameter discovery hole (ECH95-25, 347 m) drilled into Sable in August 1995 was analysed for microdiamonds. Positive results prompted an RC drilling bulk sample program in 1996. During May to July of 1996, 13 land-based NQ-diameter core holes (2,951 m) were drilled for pipe delineation. Thirty-three 12¼" RC drill holes (6,740 m) were drilled during the winter of 1996. Twenty-three holes intersected kimberlite and were completed successfully. The rest missed kimberlite or were abandoned due to difficult drilling. A follow up RC drilling program was completed in winter 2015. Eight 22" to 24" RC drill holes (2,508 m) were drilled during the winter of 2015. All intersected kimberlite, and were completed successfully.

A second program of 17 NQ-diameter core holes (4,223 m) was drilled in 2001 to acquire geotechnical data and additional pipe boundary contacts. In the fall of 2005 one NQ core hole (197 m) was drilled into the pipe. In August and September of 2006, six NQ core holes (1479 m) including three geotechnical and three delineation holes were completed.

Of the 41 RC holes, 30 are considered valid for support of grade analysis and estimation. The remaining drill holes were excluded due to quality control (QC) issues (e.g. incomplete holes or invalid down hole survey data). Thirty-one RC holes and 26 core holes were used for geological modelling. All 26 core holes were logged for geology and geotechnical data. Seven core holes were oriented for geological structure logging.

All but three collar positions of completed drill holes were surveyed using differential global positioning system (GPS) instruments. Down hole surveys of core holes were carried out with either a Maxibor or gyroscopic survey instrument. Four core holes were not surveyed for deviation due to deteriorating weather, ice and/or down hole conditions. Three of the four holes lacking down hole surveys also lack initial collar direction surveys. The planned azimuth and dip of the core holes were used in the absence survey data. These limited data were scrutinized and are considered sufficiently accurate for analysis modelling of the pipe shape and volume. The inaccuracy of the boundary contact positions are reflected in the variability of the radial coordinates of the pipe boundary contacts.

10.9.7 Jay

The Jay kimberlite was discovered in 1993 by a 151 m core drill hole (93-01). In 2005, two delineation core holes (JDC-01 and JDC-02) totalling 500 m, provided the first two boundary pierce point data for the pipe.

Nine delineation core holes (JDC-03 to JDC-13, JDC-07 and 12 abandoned) and two geotechnical holes (JDC-14 and 15) totalling 3,077 m were completed in 2007. The geotechnical holes drilled to the southwest of the kimberlite detected a large regional structure and the presence of regional geological contacts. In 1996, five RC drill holes (12.25" diameter) were completed at Jay for a total of 1,379 m. In 2006, 11 RC drill holes (17.5" diameter) were completed for a total of 3,457 m. A follow up RC drilling program was completed in winter 2015. A total of 8 RC drill holes (22" to 24" diameter) were drilled for a total of 2,392 m.

Comprehensive drilling programs were completed in the Jay area during the winters of 2014 and 2015. The program included sonic drilling for engineering dike design (90 drill holes for 1,990 m), sonic drilling within the kimberlite pipe (two drill holes for 171 m), diamond drilling for engineering dike design (46 drill holes, 1,656 m), single vertical diamond drill hole within the kimberlite pipe (354 m) and diamond drilling for geotechnical and geohydrology purposes related to open pit design (12 drill holes, 4,982 m).

A follow-up sonic drilling program was completed during winter 2016 on the planned dike alignments (19 holes for 435 m).

Additionally, there were a total of 120 Air Track drill holes (1,338 m total) drilled along the planned dike alignments and abutments for overburden thickness determination and thermistor installation.

10.9.8 Lynx

The discovery hole (NQ core) was drilled in August 1999. Two follow-up core drill holes (NQ core) and five 31.12 cm diameter RC holes were drilled in 2000 with the aim of better delineating the pipe and obtaining an initial bulk sample to assess diamond grade and quality. The RC drilling yielded a total sample weight of 170 dry tonnes.

Additional delineation core drilling (in the form of nine short vertical NQ core holes) and RC drill sampling (seven 31.12 cm diameter holes) was undertaken in 2001 to better constrain the Lynx kimberlite resource. An additional 173 dry tonnes of kimberlite were sampled during the 2001 RC program.

In 2003, six internal geology core holes (942 m) and eight geotechnical core holes were completed (928 m).

10.10 Comments on Drilling

In the opinion of the responsible QPs, the quantity and quality of the lithological, geotechnical, collar and down-hole survey data collected in the exploration and infill drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation as follows:

- Core logging meets industry standards for kimberlite exploration;
- Collar surveys and down-hole surveys have been performed using industry-standard instrumentation;
- Recovery from core and RC drill programs is acceptable;
- Drill orientations are generally appropriate;
- Drill orientations were shown in the example cross-sections in Section 7 for each pipe that has a Mineral Resource estimate, and can be seen to appropriately test the mineralization. The sections display typical drill-hole orientations for the pipes;
- Sampling methodologies are discussed in Section 11;
- Data verification performed is discussed in Section 12;
- Metallurgical recoveries are discussed in Section 13.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Conventional concepts of sample preparation and analysis do not apply to diamonds. Diamonds from large samples must be physically separated from their host rock and evaluated on a stone by stone basis. To accomplish that, all bulk samples, from RC drilling or underground/surface operations, must be processed and the diamonds separated and collected. To do that, a sample plant is required. Sample plants are essentially scaled down process plants designed to handle a few tonnes to tens of tonnes per hour.

11.1 Bulk Sampling Methods

In the case of the Fox and Koala kimberlites, underground exploration drifts (and raises at Fox) were excavated into the pipes, primarily to provide additional information on the size frequency distribution and diamond prices. The underground samples yielded large diamond parcels (more than 2,000 ct) for valuation purposes, relatively large individual sample sizes (ca. 40 to 70 t each) and at very tight sample spacing (ca. 3 m).

Single-source open-pit, production-scale sampling is occasionally carried out through the use of the process plant. The plant is purged and cleaned of blended production prior to processing and a chain-of-custody system is used to ensure proper sampling quality assurance and quality control (QA/QC).

11.1.1 Koala

11.1.1.1. Phase 5 RVK Unit

The deepening of the Koala open pit to 210 masl to remove barren Phase 4 woody siltstone kimberlite from the proposed underground low-grade sub-level block caving zone presented an opportunity to collect a run-of-mine bulk sample of the underlying Phase 5 low grade RVK unit.

A total of 808.8 wet tonnes were crushed and processed. A total of 136 ct were recovered from 664 dry tonnes for an average grade of 0.20 cpt.

11.1.1.2. Phase 6 PVK Unit

In mid-2005, an underground access drift was driven through the centre of the kimberlite pipe on the 2050L (50 masl) of the proposed Koala underground mine. Drift dimensions were approximately 4.5 m x 4.5 m. The total lateral advance of the bulk sample drift totalled 70.4 m with approximately 4,998 mucked (wet) tonnes over

21 rounds. Ten individual drift rounds (even rounds i.e. alternating, KBS2050-02 through KBS2050-20) were delivered one at a time to the mobile MMD1000 primary crusher by the underground haul trucks and D300 gravel trucks. Individual sample weights ranged from approximately 120–250 wet tonnes.

The separate sample parcels were combined to produce a single KBS-2050 parcel for the valuation of Phase 6. A total of 4,975 ct were obtained and size sorted into the DTC valuation size categories.

11.1.2 Misery

The diamond valuation data utilized for the NWT Diamonds project feasibility study for the Misery open pit mine was based upon advanced RC exploration programs in 1995. Drill hole intervals were combined into six samples by elevation range, varying in size from 109 ct to 791 ct. The individual samples were described and valued. In 2009, the samples were combined into a single parcel weighing 3,197 ct.

A four hole RC drilling program was carried out in early 2008 in order to provide additional grade data for the deeper portions of the Misery pipe (below the final extent of the open pit). Diamonds recovered from the 15 m drill hole intervals were combined into parcels according to geological domain. The diamond parcels were cleaned and valued so that a qualitative comparison could be made between the diamond populations.

To obtain a larger and more representative diamond population for the Misery Main pipe, a production test was carried out in June 2016. During the trial period from 9 June through 13 June, 2016, about 43,594 dmt of Misery Main kimberlite from the 270 m bench was processed at the main Ekati process plant. A total of 133,603 carats were recovered from the trial for an overall grade of 3.06 cpt. The final cleaned/sized parcel totalled 132,751 carats.

11.1.3 Misery Satellites

Mineral Services were retained to perform an updated Mineral Resource estimate for the Misery South and Misery Southwest Extension areas. Information from that work is summarized in this section.

Surface bulk sampling of the Misery satellite bodies has been undertaken in 2005, 2013 and 2014. In all cases, the samples were processed using the Ekati pilot sample plant at a bottom cut-off of 1.0 mm. In 2013, three bulk sample trials were completed at Misery South, yielding 8.3, 21.9 and 57.7 carats for grades of 0.2 cpt, 0.3 cpt and 1.35 cpt, respectively. Three bulk samples were also collected from Misery Southwest

Extension in 2013 and 2014, and yielded 53.5, 124.1 and 194.6 carats for grades of 1.77 cpt, 1.94 cpt and 1.93 cpt, respectively. In 2014, two bulk samples were collected from Misery Southeast, and yielded 49.4 and 10.5 carats for grades of 0.72 cpt and 0.12 cpt, respectively.

Production trials were completed at the Misery South and Misery Southwest Extension satellite kimberlites in August 2013 and September 2015, respectively. During the trial period of 10 August through 12 August, 2013, 30,640 dmt of kimberlite from the Misery South 390 m/400 m bench was processed at the main Ekati process plant. A total of 38,150 carats were recovered during the trial for an overall grade of 1.25 cpt. The complete parcel from the final day of the trial was cleaned and sized for valuation. The final cleaned/sized parcel totalled 13,894 carats.

During the production trial period of 25 September to 2 October, 2015, 70,738 dmt of Misery Southwest Extension material, from the 310 m bench, was processed at the main Ekati process plant. A total of 143,568 carats were recovered during the trial for an overall grade of 2.03 cpt. The latter portion of the trial (day 4 onward) was cleaned and sized for valuation. The final cleaned/sized parcel totalled 100,438 carats.

11.1.4 Pigeon

In 2009, a decision was made to collect a large bulk sample from the Pigeon Crater domain (RVK). The test pit would allow for metallurgical testing of the Pigeon RVK kimberlite in the Ekati process plant and would increase the valuation parcel size to allow for a more robust valuation parcel (≥ 5,000 carats). Between January and May 2010, over one million wet metric tonnes of overburden was mined at Pigeon to allow the extraction of 45,000 wmt of RVK kimberlite. A total of 33,480 dmt was subsequently batch processed in the main process plant, resulting in the recovery of 15,355 ct (0.46 cpt).

A production trial was carried out within the Pigeon open pit in June 2016. During the trial period from 3 June through 9 June, 2016, 49,500 dmt of Pigeon kimberlite from the 400 m bench was processed at the main Ekati process plant. A total of 21,051 carats were recovered from the trial for an overall grade of 0.43 cpt. The final cleaned/sized valuation parcel (day 2 onward, 4 June to 8 June) totalled 18,680 carats.

11.1.5 Sable

Thirty-three 12 ¼" (31 cm) diameter RC drill holes (6,740 m) were drilled during winter 1996 to provide grade and diamond value estimates. Twenty-three drill holes intersected kimberlite and were completed successfully. The remainder missed kimberlite or were abandoned due to drilling issues. For the 2015 winter season, an eight-drill hole bulk sample program was executed with two large-diameter flood reverse-circulation rigs. Four holes were drilled with a 22” diameter bit, and four with a 24” diameter bit. A total of 2,510 m were completed (approximately 1,508 dmt) during this program.

11.1.6 Fox

As a result of positive results from a 1993 RC bulk sampling campaign, a decline was collared in September 1993. The decline was drifted through 1,395 m of granite before entering the kimberlite in May of 1994. The kimberlite portion of the decline was completed with 99 rounds equaling 301 m, bringing the total length of the decline to 1,697 m. Two raises were completed with lengths of 51 m and 56 m. A representative sample of kimberlite (~6,800 t) was processed through the Koala pilot plant resulting in the recovery of 2,062 carats (0.3 cpt).

RC drilling programs were completed at Fox in 1995, 2000, 2004, 2005 and 2016. The RC drilling results are used primarily for grade estimation. The winter 2016 Fox RC samples are currently being processed at a commercial bulk sample plant.

11.1.7 Jay

Three RC bulk sample campaigns have been completed at Jay to date, collecting 364 valid samples totalling approximately 2,221 dry tonnes.

In 1996, five RC holes were drilled in the central to south-west portion of the Jay kimberlite. The 1996 drilling was sampled over 30 m lengths, and provided 41 samples totaling 238 t and yielding 453 carats. Samples were collected on 30 m intervals from 31.1 cm diameter (12¼”) RC holes.

Eleven additional RC holes were drilled in 2006 to create an approximately 50 m spaced grid across the pipe. The 2006 drilling was sampled over 15 m lengths, and resulted in 203 samples totaling approximately 1,030 t and producing 1,763 carats.

Six large diameter RC holes (22” to 24” diameter) were drilled in 2015. The 2015 drilling also sampled over 15 m lengths (subdivided into two intervals for the uppermost samples). This infill program resulted in 141 samples totalling approximately 1,079 t and producing 1,933 carats.

11.1.8 Lynx

Twelve RC holes were drilled and sampled in 2000 and 2001 at Lynx. The program produced 262 carats from 60 valid sample intervals totalling approximately 290 t. Samples were collected on 30 m intervals from 12.25" diameter RC drill holes.

11.2 RC Sampling Methodology

All drill material is dewatered by screening to +30 Tyler square mesh (>0.425 mm) and collected in 1,300 L bags. Samples are collected in three to five bag lots (12–30 m intervals), are then shipped to the on-site bulk sample plant where composites are prepared for processing. The purpose of collecting the relatively small samples (12-30 m composites) is to evaluate vertical as well as lateral variations in grade. The minimum sample size (2–3 t) facilitates efficient processing through the sample treatment plant and provides a representative grade sample.

Drill cuttings are composited over 12 to 30 m intervals (depending on hole diameter) to provide samples typically ranging from 5 to 9 t. This sample configuration was selected to ensure that the majority of samples yielded at least 30 diamonds to mitigate the effect of variable diamond particle size, while still providing a reasonable degree of vertical spatial resolution. Increased sample size would require longer samples that severely limit the resolution obtainable. The size of individual samples is relatively small and results in a high inherent nugget effect, typically ranging from 50-80% of the total variance.

In general, an initial 100–200 t sample is taken from each prioritized kimberlite pipe and, if encouraging results are obtained, more extensive sampling campaigns are undertaken to provide sufficient grade and diamond value data to support classification of Mineral Resources. The density and spatial distribution of RC drill holes between pipes varies considerably and depends on a number of factors including pipe size, geologic complexity and grade characteristics relative to economic cut-offs.

Ekati geological technicians are present at all times at the drill site and control on-site sampling. Their responsibilities include:

- Quality control and assurance of accuracy for each sampling interval;
- Recording significant changes in drilling conditions (e.g. squeezing, slough);
- Observations of lithology;
- Sample consistency and timing;

- Controlling bag movement and timing at the drill and transport to the bulk sample plant.

Security personnel monitor the kimberlite sampling process to deter theft and/or spiking of samples.

11.2.1 RC Sample Tonnage Calculation

Measuring the total sample weight of kimberlite at the RC rig site is not possible because fine-grained kimberlite material and water are immediately screened off during the drilling process. Consequently, sample tonnes are estimated from sample volume (derived from calliper log data) and a corresponding dry bulk density value.

The theoretical volume (V_t) of each sample is calculated as $V_t = pi * r^2 \times h$, where r is the radius of the drill bit and h is the height interval.

The estimated volume (V_e) of each sample is calculated from the calliper data. The volume of each 2.0 cm interval (disc) measured by the calliper is calculated using the above formula, with r being the hole radius as measured by the calliper tool. The total volume is then determined by summing the individual disc volumes over the length of the sample.

Calliper diameters that are smaller than idealised hole diameters indicate squeezing. For intervals affected by squeezing, data are corrected such that the minimum radius equals that of the idealised hole. For drill hole intervals with missing surveyed volumes or exceeding the limits of the calliper, volumes were estimated using the relationship between another callipered volume and relative sample weights within the same domain and where possible within the same drill hole.

Volume calculations are verified by experienced personnel to ensure that calliper data corresponds to the sample intervals and that appropriate correction procedures are applied.

11.2.2 Slough Diamond Allocation

Slough occurs when material falls from the drill hole wall to the bottom of the hole, where it is circulated to surface with the “as-drilled” material. Attempts to mitigate the influence of slough are managed by collecting separate slough bags, which are processed separately, whenever sloughing is suspected. Sloughing may be indicated when more material than the ideal is collected over a given interval of drilling. The slough diamonds recovered are allocated to the overlying samples in the drill hole. The Ekati geological technician monitors and controls the collection of slough bags.

Calliper diameters that are larger than the idealised hole diameters indicate sloughing. The discrepancy between theoretical and estimated volumes provides an indication of the degree of sloughing of the drill hole and is called the slough factor (*S%*). *S%* is calculated as $S\% = 100^* (V_e - V_t) / V_t$.

Diamonds from slough samples as carats (ct_{slough}) and number of stones ($\#_{slough}$) are allocated to the overlying RC samples in proportion to the amount of sloughing that has occurred (*S%*) and the number of carats and stones collected in the interval (Ct_{sample}, $\#_{sample}$). An allocation factor ($AFCt_{sample}$, $AF\#_{sample}$) is calculated for each sample as follows, where Σ is the sum of all samples to which the slough diamonds will be allocated:

$AFCt_{sample} = (S\%_{sample} / \Sigma S\%) \ x \ (ct_{sample} / \Sigma Ct)$;

$AF\#_{sample} = (S\%_{sample} / \Sigma S\%) \ x \ (\#_{sample} / \Sigma \#)$.

The number of slough carats and stones allocated to each sample ($Ct_{slough\ per\ sample}$, $\#_{slough\ per\ sample}$) is calculated as follows:

$Ct_{slough\ per\ sample} = ct_{slough} \ x \ (AFCt_{sample} / \Sigma AFCt)$;

$\#_{slough\ per\ sample} = \#_{slough} \ x \ (AF\#_{sample} / \Sigma AF\#)$.

$Ct_{slough\ per\ sample}$ and $\#_{slough\ per\ sample}$ are added to the results of each sample to produce an adjusted carat weight and stone count for each sample ($AdjCt_{sample}$, $Adj\#_{sample}$).

$AdjCt_{sample} = Ct_{sample} + Ct_{slough\ per\ sample}$;

$Adj\#_{sample} = \#_{sample} + \#_{slough\ per\ sample}$.

11.3 Sampling Protocols

The drill sample collection process is designed to ensure that a representative, unbiased and uncontaminated sample is collected intact at the drill. A closed-loop circulation system is used for undersized material and water. This allowed larger and deeper holes to be drilled as the drill hole wall could be conditioned with products that prevented the walls from collapsing prior to reaching the target depth. RC drilling has been noted as a potential source of stone damage from the bit itself or high-pressure transport around sharp corners.

A study comparing the Misery RC parcel to the Misery production parcel showed a slight increase in breakage; however, breakage is deemed too insignificant to incorporate into grade estimation. Preliminary tests were carried out in early RC programs (winter 1993) but were discontinued due to the difficulties encountered in the picking of the tracer diamonds.

Diamonds are recovered and weighed from each sample using duplicate processes at every point to minimise loss (recirculating oversize through the sample plant, duplicate X-ray sorting and duplicate hand-picking). The errors detected from these processes are not quantifiable.

Density tracer beads are used to monitor and adjust the density of the heavy medium in the sample plant and ensure efficient recovery of heavy mineral concentrates from grade samples. To control the effectiveness of diamond extraction, the processed kimberlite concentrate fractions have been audited for missed stones with an additional X-ray pass and a double grease table pass. Hand sorting is an efficient method of diamond recovery from concentrate and concentrates are routinely double picked (by different sorters). Third pass auditing has been useful to confirm hand sorting efficiencies.

The concentrates were sorted by trained Ekati technicians in areas where personnel movement and product control are strictly monitored, either at the sorting and valuation facility in Yellowknife or at the Ekati sort house (final recovery area). Sorting of non-magnetic material was conducted in two passes by having a second sorter audit the first sorter. The first sorter picks the entire size fraction of a given sample and records the count. The second sorter re-picks the entire size fraction of a given sample to make sure no stones have been missed, and weighs all stones for that sample found. These data are recorded in GBIS.

Diamonds from individual samples are sized using Pierre round aperture sieves to provide stone size distribution information. Picking data are double checked for accuracy during the sieving procedure as the inventory of sieved stones is verified against the picked stone data through a recount and reweigh. Stones are sieved in a manner as to reduce the risk of losing small stones. After sieving, all size fractions are recombined, recounted, and reweighed. This final total is compared with the sum of all Pierre size fraction counts and weights and the initial weight and count for verification that no stones have been lost or miscounted.

The Ekati valuation parcels are stored at Dominion’s Toronto sorting facility.

The carat weight method was utilised for all Ekati grade estimates prior to 2014. The method is simply based on total carat weight for all diamonds retained on a circular 1 mm aperture sieve divided by the estimated total sample weight (dry tonnes). In 2014 a method of grade estimation using stone density data (stones per cubic metre) and diamond size distributions was introduced, and has been implemented for the Jay, Sable and Fox Mineral Resource estimates.

11.4 Sampling Error

Sampling error has the potential to cause over- or under-estimation of grade. For both RC and drift bulk samples, it is typically not possible to measure fundamental grade sample error (e.g. check assays) as the entire sample is processed.

Ekati exploration bulk samples were mostly processed with slot de-grit screens with width dimension from 0.5 mm to 1.0 mm (Table 11-1). The exception was the 2008 RC Misery samples, which were processed utilizing a 1.2 mm slot de-gritting screen. Although all final parcels are screened at 1.0 mm (circular aperture) and only the +1.0 mm diamonds are reported, there is a minor error associated with normalizing the data from the different de-grit screens.

Table 11-1: De-grit Screen Slot Width for Key Bulk Sample Programs

Campaign Year	Type of Program	Key Pipes Sampled	Slot de-grit screen
1994	Decline	Fox	1.0 mm
1995	RC Drilling	Fox, Misery, Koala	0.5 mm
1996	RC Drilling	Jay, Sable	0.5 mm
1998	RC Drilling	Pigeon	0.5 mm
2000–2001	RC Drilling	Fox, Lynx	0.5 mm
2002–2003	RC Drilling	Koala	1.0 mm
2004–2005	RC Drilling	Fox	1.0 mm
2006	Decline	Koala	1.0 mm
2006	RC Drilling	Jay	0.65 mm
2008	RC Drilling	Misery	1.2 mm
2015	RC Drilling	Jay, Sable	1.0 mm
2016	RC Drilling	Fox	1.0 mm

Dominion considers that the precision of the diamond weight estimates is high, because concentrates are double picked by different qualified sorters and audits are undertaken on the double picked concentrates. A detailed audit report was completed by BHPB for the 2006 underground drift sampling at Koala. Results were the weight percentage of stones recovered in third picks (generally coated, fibrous and/or small) is generally less than 0.5%.

Recovered diamonds from RC samples are weighed after the sorted diamonds are combined from the various fractions (e.g. X-ray and grease table passes) for each drill hole interval. Diamonds are then sieved with Pierre sieves (circular aperture) prior to weighing. Recovered diamond weights are recorded in carats to two decimal places. The balances used are subjected to regular testing every 12 months by a technician from the Fisher Scientific office located in Edmonton, Alberta. Balances are recalibrated biweekly on average, and following any move or displacement.

There is a small error introduced for the RC grade samples as the diamonds are not cleaned for individual drill hole intervals. Diamonds are cleaned after the smaller drill hole interval samples (i.e. RC grade samples) are combined into parcels related to geologic domains. Combined RC sample parcels are then sorted by size and quality for diamond value estimates. Sample error can arise from the non-allocation or misallocation of slough diamonds in RC drill holes. The potential error resulting from misallocation of slough diamonds is considered to be a small fraction of the total slough diamond carat weight due to the reallocation procedure described previously.

RC sample grades are stated as weight or number per volume (carats per cubic metre or stones per cubic metre) to three decimal places for analysis and estimation. The accuracy of the RC drill hole volume estimates are therefore critical to the reported RC sample grade.

11.5 Density Determinations

Samples are taken from core holes for determination of dry bulk density and moisture content of host rock and kimberlite. The samples were not coated or wrapped prior to weighing in water which can introduce a measurement error for samples that were unusually porous.

Sample spacing has historically varied from 1 m to 10 m in kimberlite (generally 2–3 m intervals) and every 5 to 10 m in host rock.

The procedure used is as follows:

- 60 mm samples are weighed in air (m_{air}) and water (m_{water});
- 20 mm samples are crushed and re-weighed in air (m);
- 20 mm samples are dried in oven for 24 hours and re-weighed (m_{dry});
- Moisture content (%) calculated as: $w = 100 * (m - m_{dry}) / m$;
- In situ (wet) bulk density calculated as: $BD_{wet} = m_{air} / (m_{air} - m_{water})$;
- Dry bulk density (BD_{dry}) calculated as: $BD_{dry} = BD_{wet} * (1 – w/100)$.

Dry bulk density in wall rocks is determined using similar methods to those employed for drill core; however the sample spacing is determined by one sample per representative geologic unit, and by lithological distribution.

11.6 Sample Plant Operations

Until 2003, all samples used for grade and value estimates were processed through a pilot processing plant at Koala Camp. Concentrate was shipped to Reno, Nevada where it was processed and picked by experienced personnel. In 2003, the pilot plant was dismantled and the site was reclaimed. An improved on-site sample plant was constructed within the main process plant and was commissioned in early 2003. RC drill samples and run-of-mine (ROM) bulk samples were processed in the sample plant to provide grade and diamond size distribution/quality data.

The sample plant is essentially a scaled-down version of the Ekati process plant with similar process flow design. The primary difference between the process plant and the sample plant is the cut-off size; a cut-off size of 1.2 mm is used at the process plant, whereas the sample plant cut-off size can be changed at any time depending on the samples being processed. RC samples are generally processed using 1.0 mm slot de-grit screens.

Another difference between the process plant and sample plant is the absence of magnetic separation (both wet high intensity magnetic separation (WHIMS) and high intensity magnetic separation (HIMS)) in the sample plant.

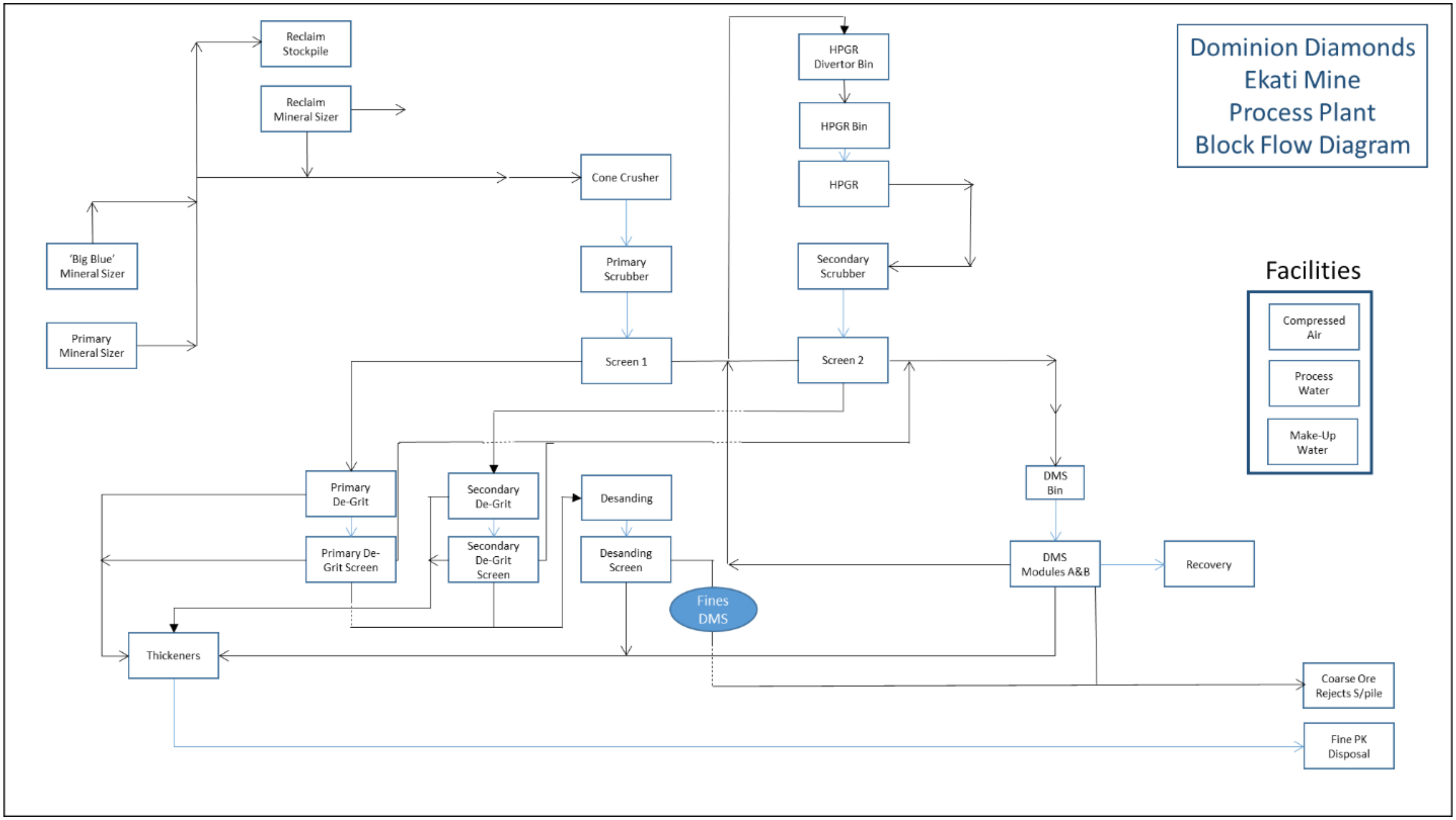
The sample plant consists of five modules: crushing, feed preparation, dense media separation, recovery and thickening:

- Crushing: run-of-mine (ROM) bulk samples are sized to 100% -300 mm through the MMD 1000 sizer before it is delivered to the sample plant. The -300 mm sized material is delivered to the sample plant where it is crushed to -75 mm by a toothed jaw crusher. The crushed material is further reduced to -40 mm by a galaxy sizer before it is pumped to the feed preparation circuit. RC samples are not run through the jaw crusher, but go through all other crushing steps;
- Feed preparation: the galaxy sizer product is scrubbed through a 6 ft by 8 ft scrubber before it is washed and sized on the feed preparation screen as follows:
  - Any +20 mm material is sent to the cone crusher for size reduction to -8 mm;
    - Any -20 +1 mm material is sent to DMS circuit;
    - Any -1 mm material is sent to the desand circuit;

- Dense media separation (DMS): -20+1 mm material is pumped to the DMS circuit. The material is first washed before it is mixed with ferrosilicon slurry having a specific gravity of 2.65 and fed to a cyclone at 160 psi. The heavy SG material is recovered as sink material and sent to the recovery circuit as DMS concentrate. The light SG material is rejected as float material. -6+1 mm float material is rejected as tails while +6 mm float material is re-crushed through a double roll crusher (DRC) to -4 mm. The re-crushed product from the DRC is fed back to the feed preparation for another round of processing. The ferrosilicon slurry is washed from the float and sink material and recovered by a magnetic separator;
- Recovery: the DMS concentrate is pumped to a dewatering screen before it is stored in a bin for later processing through the recovery circuit. The dewatered DMS concentrate is processed through a two-pass flow-sort X-ray unit, the flow is controlled to produce a monolayer to avoid shadowing. The X-ray tails are processed through a grease table before it is rejected as coarse tails on CV05;
- Thickening: all -1 mm effluent from the feed preparation and DMS circuits is pumped to the desand circuit where it is processed through a cyclone. The cyclone overflow (D80 of 100 µm) is fed to the thickener. The cyclone underflow is dewatered through 0.5 mm aperture screen. The -0.5 mm effluent is sent to the thickener while the +0.5 mm material is rejected to coarse tails conveyor. Coagulants (Magnafloc 156) and flocculants (Magnafloc 356) are used in the settling of fine tails in the thickener. The overflow water is recycled and reused in the sample plant.

Figure 11-1 illustrates the typical sample plant recovery process from a run of the mine sample to sorting and valuation.

Figure 11-1: Sample Plant Flowsheet



Note: Figure prepared by Dominion, 2016.

Prior to 2003, concentrate from the Koala pilot processing (DMS) plant was delivered in sealed drums to a BHP Billiton diamond recovery plant in Reno, Nevada. Initial processing of the concentrates derived from the DMS plant was similar that described above and screened samples into three different size fractions (+4 mm; -4+2 mm; 2+1 mm or -2+0.5 mm).

Diamond concentrates were produced for each of these fractions using X-ray sorting (Flow Electronics XR 2/19 SW, wet feed type, two-channel, single-pass sorter machine) with the X-ray tails being processed over grease tables to recover non-fluorescent diamonds. A minimum of two passes through the X-ray sorter and grease tables was required and the machine was spiked for quality control prior to each run using X-ray luminescent tracers to monitor diamond recovery efficiency. Grease table audits of the X-ray rejects and random triple manual picking audits of the concentrates result in minor recoveries of small stones. Results of the audits are not applied to the grade data (as the audit data are limited to a small number of samples) and are only used for QA/QC purposes.

All diamond concentrates (pre- and post-2003) from the X-ray sorter and grease tables are dried and weighed, and are double picked for diamonds by experienced diamond sorters with training in diamond identification. X-ray and grease table diamond quantities and weights are recorded separately. After the diamonds are extracted, weighed, and counted, the diamonds are then screened into size fractions and the sieved fractions are weighed and counted. A bottom screen cut-off of 1.0 mm (circular aperture) is utilised for exploration diamond parcels. The total carat weight per sample (pre-cleaned) is used for grade estimation. Individual sieve data are used to address any anomalous stone size distributions and investigate for the effects of large stones within a sample.

The stones from each sample are grouped together and acid cleaned to remove silicate contaminants and coatings on diamond. The cleaned diamonds are re-sieved and described in terms of size, colour, colour intensity, shape, and clarity by trained diamond geologists. Parcels are then sized into Diamond Trading Company (DTC) sales categories and are shipped to Dominion's Toronto marketing office for detailed valuation by trained diamond sorting staff, and for storage.

11.7 Quality Assurance and Quality Control

Prior to running a sample through the sample plant, a visual inspection of the equipment is performed by certified sample plant technicians, especially screens to replace worn panels; the screens are also washed to mitigate contamination between samples.

The gap of the cone crusher is monitored to produce -8 mm material and the double roll crusher to produce -4 mm material. Tracer tests are frequently performed on the DMS circuit and on the recovery circuit to monitor their efficiency. Once processed, the samples are kept until the results are known as another pass might be required if there is a reason to believe that the results are not correct.

A grease table is prepared and cleaned for each sample as well as recovery bins are emptied. The X-ray and grease table concentrate are transferred to the sort house and double-picked by highly qualified diamond sorters in order to recover all the diamonds.

The valuation parcels are stored in Dominion's Toronto office, and are available for further analysis.

11.8 Databases

11.8.1 Database Management

Dominion maintains a site-wide Records Information Management (RIM) system using digital filing. All non-digital information relevant to the Mineral Resource has been scanned and is stored in this system. All digital data not compatible with Dominion's digital filing system (e.g. Vulcan files) are stored on file servers at Ekati and Yellowknife.

Data are captured as follows:

- Geological data: Currently, data are recorded into GBIS, a commercially-available software system. Legacy data were captured in a variety of formats including paper, Excel, and PDA/Access. Paper files per drill hole are filed both at Ekati and have been scanned and stored in Dominion's document management system. Transcription errors are first reduced by double checking keyed data. GBIS data are validated and rechecked by logical routines for transcription errors, out of range errors, and down-hole sequencing. The intact pipe wall and pipe stratigraphy drill core intersections are retained at the Ekati core logging facility;
- Downhole survey data: Down-hole survey data are currently stored in GBIS whereas legacy data which has yet to be imported into the database are stored in Vulcan and Excel. Downhole survey data that are collected through Maxibor or gyroscope, are verified in the field. The data are matched with survey (RTGPS method) collar data, and uploaded electronically into the database by the data collector. The results are further verified by drill hole plots and sections. Raw downhole survey files are retained by drill hole and stored with the drill core photos and/or other non-database related information. Single shot (EZ Shot) survey data

are added to the database manually after corrections are applied for magnetic declination;

- Sieve data: All sieve data are entered in GBIS with built-in quality control measures, verified by a second party, and total stone counts and weights (carats) per sample are calculated using GBIS. Legacy grade data are maintained in a series of Vulcan files by kimberlite. These are stored on the file server;
- Physical properties data: All electronically-collected data (e.g. calliper, downhole geophysical surveys), is uploaded directly to the GBIS database through a series of software macro that were developed as part of the system design. The raw data files are stored in individual drill hole folders. All other data that are associated with the drill holes are entered directly into GBIS.

Security of the database is maintained through permissions determined at log in by each user. Backups of the digital data are regularly performed.

11.9 Sample Storage

Core is stored at Ekati in a large sprung structure or outside on pallets. Development and delineation holes are stored on-site; kimberlite is kept in the core storage sprung for protection from the elements, while wall-rock is stored outside at the mine site as it can withstand harsh weather conditions and freeze-thaw cycles.

The core logging facility is located adjacent to the core storage sprung structure. As much as 2,000 m of core can be fed into the core logging facility and, if frozen, is thawed then logged on a roller conveyor system.

Reverse circulation chip samples are also stored at the Ekati core logging facility in water tight containers for future reference.

11.10 Sample Security

A card-locked door controls the access to the sample plant and strategically installed cameras operate in sensitive areas such as the recovery plant, the sample plant is a high-risk area where 100% of the employees are searched by a security officer prior to exiting the area.

For each sample, the X-ray concentrate and the grease table goods are transferred to the sort-house for diamond sorting. Each sample is kept separate from the process plant goods and individually labelled for shipment to Dominion's sorting and valuation facility located in Yellowknife. The sample goods are individually sieved and cleaned in Yellowknife and then sent to Toronto for valuation.

The sample plant facility is a high-security area with similar protocols to the main plant recovery area.

During RC drilling programs for large-scale samples, the RC drilling area is monitored by an Ekati site security officer and access is limited to essential personnel only.

11.11 Valuation Parcels

11.11.1 Koala

Valuation parcels used to constrain the Koala underground diamond price estimates (Phases 5, 6 and 7) include RC drilling samples, underground drift sampling at approximately the 2050L (50 masl; samples were taken during the feasibility study) and run-of-mine (ROM) samples from the lowermost open pit and underground development rounds.

The Phase 5 (RVK) valuation is based on stone size distribution from RC drill hole intervals and ROM open pit sampling of the Phase 5 kimberlite along with the price data from all available Koala parcels. The total parcel size for the stone size distribution data set is 233 carats.

The Phase 6 (VK) valuation is based on the stone size distribution data from underground drift sampling of the Phase 6 kimberlite along with the price data from all available Koala parcels. The total parcel size for the stone size distribution data set is 4,975 carats.

The Koala Phase 7 (VK/MK) valuation is based on stone size distribution from underground development run of mine sampling of the Phase 7 kimberlite along with the price data from all available Koala parcels. The total parcel size for the stone size distribution data set is 368 carats.

11.11.2 Fox

The Fox (TK) valuation is based on stone size distribution data and valuation data of a 2,062 carat parcel obtained from an underground exploration drift at an approximate elevation range of 175–200 masl.

The 2016 RC drill program parcel was in progress at the time of preparation of this Report and no valuation has yet been completed.

11.11.3 Misery Main and Misery Satellite Pipes

The diamond valuation data utilized for the Misery Main pipe is based upon size distribution data from 1995 and 2008 RC drilling programs along with the price data from a production trial from Misery Main carried out in June 2016. The production trial parcel totalled 132,751 carats. The 1995 and 2008 RC drilling parcels used for the stone size distribution sets weighed 3,197 carats and 743 carats, respectively.

The diamond valuation data utilized for the Misery Southwest Extension is based upon a production trial carried out in October 2015 (101,019 carats).

The diamond valuation data utilized for the Misery South is based upon a production trial carried out in August 2013 (13,815 carats).

11.11.4 Pigeon

The Pigeon diamond valuation estimate is based on the combined diamond value dataset from a production parcel (15,355 carats) obtained from a trial pit in early 2010 and smaller RC drilling diamond parcels (687 carats). The diamond size distribution data from RC drilling campaigns sampling two kimberlite domains (RVK and MK) are used in combination with the overall price data to estimate domain specific average diamond values and recovery factors.

11.11.5 Sable

Price estimates for Sable are based on the complete results from large diameter RC drilling programs carried out in 1996 and 2015 which in total yielded 2,234 carats (+1 DTC sieve size) for valuation.

The 1996 RC samples were processed at the Koala pilot plant using 0.5 mm slot de-grit screens and the 2015 samples were processed at the Ekati bulk sample plant using 1.0 mm slot de-grit screens.

11.11.6 Jay

Price estimates for Jay are based on the combined results from large diameter RC drilling programs carried out in 1996, 2006 and 2015 which in total yielded 4,123 carats (+1 DTC sieve size) for valuation.

The 1996 RC samples were processed at the Koala pilot plant using 0.5 mm slot screen de-grit screens. The 2006 and 2015 RC samples were processed at the Ekati bulk sample plant using 0.65 mm and 1.0 mm slot de-grit screens, respectively.

11.11.7 Lynx

Price estimates for Lynx are based upon the combined results from large diameter RC drilling programs carried out in 2000 and 2001 which it total yielded 277 carats (+1 DTC sieve class) for valuation.

11.12 Comments on Sample Preparation, Analyses, and Security

The responsible QPs are of the opinion that the quality of the diamond recovery and valuation data are sufficiently reliable (also see discussion in Section 12.0) to support Mineral Resource and Mineral Reserve estimation, and that sample preparation, analysis, and security are generally performed in accordance with exploration best practices and industry standards as follows:

- Data are collected following industry-standard sampling protocols;
- Sample collection and handling of core was undertaken in accordance with industry-standard practices, with procedures to limit potential sample losses and sampling biases;
- Bulk samples in the form of underground exploration drifts, test pits, or production-scale open-pit sampling were also collected in accordance with industry-standard practices, with procedures to limit potential sample losses and sampling biases;
- Large-scale RC sampling was undertaken in accordance with industry-standard practices, with procedures to limit potential sample losses and sampling biases. RC sample intervals were composited over 12 to 30 m intervals (depending on hole diameter) to provide samples typically ranging from 5 to 9 t; the sample intervals were selected appropriately to ensure each composite contained at least 30 diamonds to mitigate the effect of variable diamond particle sizes;
- Bulk density determination procedures are consistent with industry-standard procedures, and there are sufficient bulk density determinations to support tonnage estimates;
- Sample tonnes are estimated from sample volume (derived from calliper log data) and a corresponding dry bulk density value. In accordance with best practices, the resulting volume calculations are verified by experienced personnel to ensure that calliper data correspond to the sample intervals and that appropriate correction procedures are applied;
- Diamonds are recovered and weighed from each sample using appropriate duplicate processes at every point to minimise loss;

- The sample plant is essentially a scaled-down version of the Ekati process plant with similar process flow design; because of this similarity it is considered that the smaller sample parcels processed through the plant reflect the recoveries that would be expected from the Ekati process plant;
- Diamond valuations used for Mineral Resource and Mineral Reserve estimates are based, depending on pipe, on a combination of RC and bulk samples. Diamond reference prices correspond to Dominion's June 2016 Price Book. Valuation figures vary by pipe and domain;
- Data are appropriately managed through a dedicated database. Data that were collected were subject to validation, using in-built program triggers that automatically checked data on upload to the database;
- Verification is performed on all digitally-collected data on upload to the main database, and includes checks on surveys, collar co-ordinates, geological/geotechnical logging, and diamond sampling and valuation data. The checks are appropriate, and consistent with industry standards;
- Sample security is in line with industry practices for diamond operations. A card-locked door controls the access to the sample plant and strategically installed cameras operate in sensitive areas; in such areas, 100% of the personnel are searched by a security officer prior to exiting the area;
- Sample storage is in line with industry standards; sample retention policies are well established and appropriate to the mineralization style.

12.0 DATA VERIFICATION

12.1 Down Hole Deviation Survey Accuracy

Studies have been conducted to assess down-hole deviations in core holes, and have used data from Koala and Panda.

The expected maximum survey instrument error, 1.7 m per 100 m was used to derive the error peripheral limits, herein termed “error circle” at pierce point contacts from surveyed holes for volume range analysis modelling. An error of 5.6 m per 100 m or two standard deviations of the average measured deviation from the underground core drilling program was used to derive error circles for core holes where downhole surveys were partially or completely estimated.

12.2 Database Verification

12.2.1 Data Reviews

All drill hole data are recorded either on paper logging sheets or digitally. In the case of paper logging sheets, the data are captured and verified into MS Excel spreadsheets, and made available for review. All survey, bulk density, and geotechnical data are reviewed for accuracy by the Resource and/or Production Geologists and corrected as necessary

Verification procedures include visual checking for transcription errors, and database checks using software routines. After this preliminary error-checking, all hardcopy and digital data for each drill hole are validated by the Resource Geologist.

12.2.2 Database Maintenance

All digital data required to re-create the Mineral Resource estimate are secured in a central Vulcan project database at the Ekati Project site. The resource and production geologists maintain the Vulcan project databases and metadata documentation. These are employed to secure the data and maintain an audit trail of the deposit database.

12.3 Sample Plant Audits

Comprehensive audits were carried out on the Ekati sample plant in September 2006 upon completion of a contract project with Peregrine Diamonds Ltd. There were no concerns noted, and the sample plant was found to be operating with very high efficiency rates.

The sample plant was also audited in January 2007. A composite sample (202 kg) was prepared by combining four Koala RC concentrate tails. The first pass results of the four samples totalled 31.16 carats. The composite sample was run through the final recovery circuit three times to purge the sample from remaining diamonds. A total of 3.17 carats were recovered in the purge stages. Approximately 91% of the diamonds by carat weight were recovered in the original sample process (i.e. after the first pass final recovery circuit). The recovery ranged from 65.6% for the grease table to 96.3% by the X-ray circuit. The X-ray circuit (two X-ray units in parallel) yielded significantly higher recovery rates.

The purged (barren) composite concentrate sample was then spiked with a control parcel from the Misery pipe (53.49 carats). The spiked concentrate was run through a first pass recovery using the same procedures as for typical exploration samples (i.e. single pass through two X-ray sorting units and single pass over grease table). The overall recovery of the introduced Misery diamonds after the first pass recovery was approximately 92% by carat weight. Almost all of the diamonds were recovered via the X-ray circuit. The grease table recovery was negligible for the first pass of the audit test.

The audit is considered to provide strong evidence that the Ekati sample plant was operating at high efficiency. The overall recovery in terms of value (92%) and carat weight (92%) for the first pass audit suggested that a second pass through recovery was not critical for most applications (e.g. grade control, follow-up bulk samples). The use of a second pass for the audit test increased the overall recovery to 98% in terms of value.

A bulk sample plant audit was carried out during the 2015 Jay program. The audit focused on the DMS float fraction (tails) was undertaken for six representative samples. The audit sample information is detailed in Table 12-1. The audit samples were shipped to Saskatchewan Research Council Geoanalytical Laboratories Diamond Services in Saskatoon, Saskatchewan.

Table 12-1: Jay 2015 Dense Medium Separation Tail Audits – Sample Information

Drill Hole	Batch No.	Sample (dmt)	DMS Tails (wmt)	Kimberlite Domain
J19	B6	6.80	0.77	RVK
J19	B12	10.39	3.36	MIX
J19	B17	8.64	3.52	VK
J21	B6	7.78	1.58	RVK
J21	B13	12.00	2.01	MIX
J21	B18	10.30	3.57	VK

Note: dmt = dry metric tonne; DMS = dense media separation; wmt = wet metric tonne; RVK = resedimented volcaniclastic kimberlite; MIX = mixed or transitional zone where the RVK and VK interface; VK = volcaniclastic kimberlite.

The six DMS tail samples were processed at Saskatchewan Research Council Geoanalytical Laboratories Diamond Services using a similar configuration bulk sample plant to the Ekati BSP. Granulometry was completed on the samples before processing. The tail audit process involved several stages including first pass recovery of diamonds prior to crushing, sequential crushing and processing stages using 4 mm and 2 mm gap. The overall results of the DMS tail audits are provided in Table 12-2. Audit sample grades vary from 0.12 to 0.24 cpt. The average stone size ranges from approximately 0.03 to 0.04 cpt. Most of the audit diamond recoveries fall into the three smallest DTC size categories (-7+5, -5+3 and -3+1).

Table 12-2: Jay 2015 Dense Medium Separation Tail Audits – Results

Drill Hole	Batch No.	Sample (dmt)	Kimb. Domain	Stones	Carats	cts/stone	cts/dmt
J19	B6	6.80	RVK	40	1.44	0.036	0.21
J19	B12	10.39	MIX	88	2.54	0.029	0.24
J19	B17	8.64	VK	73	1.90	0.026	0.22
J21	B6	7.78	RVK	36	1.43	0.040	0.18
J21	B13	12.00	MIX	48	1.46	0.031	0.12
J21	B18	10.30	VK	83	2.26	0.027	0.22

Note: dmt = dry metric tonne; cts = carats; cts/dmt = carats per dry metric tonne; RVK = resedimented volcaniclastic kimberlite; MIX = mixed or transitional zone where the RVK and VK interface; VK = volcaniclastic kimberlite.

The overall diamond recovery of the Ekati BSP as indicated by the DMS audit test (Table 12-3) is approximately 91% by carat weight and 95% by carat value.

Table 12-3: Jay 2015 Dense Medium Separation Tail Audits – Comparison to Ekati Bulk Sample Plant Data

Drill Hole	Batch No.	Sample (dmt)	Kimb. Domain	BSP Stones	BSP Carats	BSP cts/st	Audit Stones	Audit Carats	Audit cts/st	cts/dmt
J19	B6	6.80	RVK	134	18.58	0.139	40	1.44	0.036	0.21
J19	B12	10.39	MIX	133	20.42	0.154	88	2.54	0.029	0.24
J19	B17	8.64	VK	147	12.45	0.150	73	1.90	0.026	0.22
J21	B6	7.78	RVK	57	4.77	0.084	36	1.43	0.040	0.18
J21	B13	12.00	MIX	245	27.19	0.111	48	1.46	0.031	0.12
J21	B18	10.30	VK	249	22.53	0.090	83	2.26	0.027	0.22

Note: dmt = dry metric tonne; BSP = bulk sample plant; cts = carats; cts/st = carats per stone; RVK = resedimented volcaniclastic kimberlite; MIX = mixed or transitional zone where the RVK and VK interface; VK = volcaniclastic kimberlite.

There do not appear to be any significant differences by kimberlite domain. The Ekati processing plant is currently configured to recrush the DMS float fraction and recirculate the crushed fraction through the plant. This process would also likely be utilized during processing of the Jay kimberlite.

12.4 Technical Reports

Data verification was also performed by Dominion in support of the two technical reports filed on the Project. This included confirmation of drill hole data supporting the resource models, grade data reconciliation, verification of diamond parcel data, and use of check sheets for Mineral Resource and Mineral Reserve reporting QA/QC.

12.5 Comments on Data Verification

The responsible QPs consider that a reasonable level of verification has been completed during the exploration and production phases, and no material issues would have been left unidentified from the verification programs undertaken.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Test Work

13.1.1 Plant Design Test Work

The studies summarized in Table 13-1 were completed in support of the original plant design.

Table 13-1: Plant Design Test Work Summary

Laboratory	Testing Performed
Dia Met plant, Fort Collins, Colorado	Pilot-scale processing of bulk drill samples
BHP Minerals' facility, Reno, Nevada	Downstream processing of the pilot plant concentrates for diamond recovery
Krupp-Polysius, KHD Humboldt Wedag, LLCF	High pressure grinding roll (HPGR) test work
Allied Colloids	Flocculant requirement determination by pipe
Eimco, Outokumpu Mintec	Settling tests on samples from Koala, Panda, Fox and Misery
Eimco, Outokumpu Mintec	High rate thickening test work small-scale test units
Hazen Research	Grindability test work on Koala core samples
Nordberg	Water flush crushing tests by on Fox and Panda bulk sample material and Leslie surface material
Steffen Robertson & Kirsten	Rock strength property determinations
Jenike and Johanson	Material flow property test work on Panda and Fox bulk sample material
Pipeline Systems Incorporated; Georgia Iron Works	Processed kimberlite pumping test work on Fox and Panda bulk sample material

Since plant construction, additional work has included:

- Conversion from a one feed source (Panda) operation to multiple feed source plant operation (Panda, Koala, Koala North, Misery, Fox, and Beartooth);
- Expansion of the nameplate operation rate from 9.0 kt/d to 12.5 kt/d;
- Tying-in underground feed and testing the impact of underground metal and additives (e.g. shotcrete) from Beartooth, Koala North and Panda;
- Completion of scheduled sampling for crushability testing as required for the material in the Mineral Reserves mine plan;
- Revision of the 1995-designed scrubbing, settling and thickening plant treatment envelope through direct drill core sampling of additional resources in the Mineral Reserves mine plan;

- Performing ongoing monitoring of mineralogy and metallurgical behaviour of dense media concentrations and other minor variables of exploration samples collected for on-site bulk sample treatment.

13.1.2 Current Testing

Metallurgical test work is carried out at the Ekati Project site using both the main process plant (production trials) and a similarly configured smaller sampling plant (approximately 10 t/h). Historically, production trials were completed at various times for the Fox, Misery and Koala open pit operations and during pre-feasibility level studies for Koala North and Pigeon (test pits). More recently, production trials were completed within the Misery pushback pit in August 2013 (Misery South), in September 2015 (Misery Southwest Extension) and in June 2016 (Misery Main). A production trial was also completed at Pigeon in June 2016.

The sample plant is utilised for grade model validation for the current operations, testing of new kimberlite sources as possible process plant feed (e.g. satellite kimberlite intrusions and reprocessed plant rejects) and periodic recovery audits for the main process plant. The processing circuit comprises crushing, scrubbing, sizing, dense media separation and final diamond recovery using both X-ray sorting and grease table methodologies.

Security protocols are in place at the recovery area of the main process plant and sample plant.

The process plant head feed is sampled daily for moisture content and the moisture is adjusted regularly to reflect the results. The plant feed conveyor (CV005) and coarse rejects conveyor (CV017) are calibrated every five weeks. Various sampling and quality assurance programmes are undertaken by laboratory technicians and metallurgists. These include flocculant and coagulant strength tests, particle size analysis, waste counts, FeSi quality, and FeSi losses.

Regular tracer tests are completed periodically on the DMS and X-ray circuits using non-magnetic, fluorescing density tracers of various sizes. The tests audit the DMS and recoveries for efficiency. Security protocols (including mandatory searches and video surveillance) are in place at the recovery area of the main process plant and for the sample plant.

13.2 Recovery Estimates

Recovery of diamonds is a function of many variables including process plant configuration (e.g., primary sizers and crushing circuit, de-grit screens, dense media cyclones, final recovery using X-ray and grease table separation), kimberlite feed characteristics (e.g. clay content, inclusion of granite and/or other country rock fragments) and metallurgical variability.

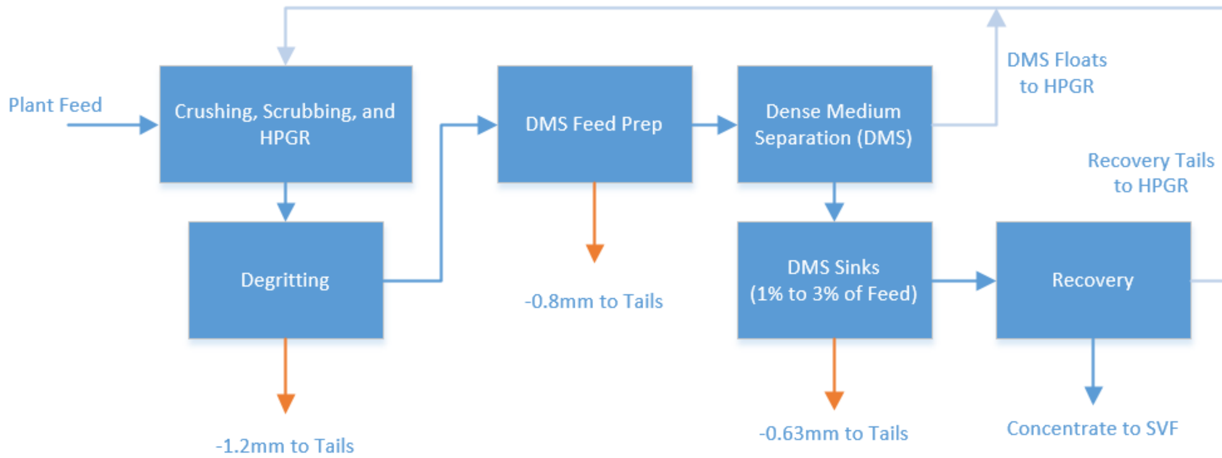
Diamond processing plants are designed to target a given size range based on the overall economic value distribution of the diamonds in the plant feed. The plant overall top cut-off represents the maximum feed size to DMS and the overall bottom cut-off represent the minimum feed size to DMS. These figures are normally quoted as nominal values in millimetres, and represent the screen aperture size of the screens that make the final size classifications. The effective cut-offs can differ from the nominal values due to factors such as screen wear, screen aperture shape, particle shape and screening efficiency.

At the Ekati Mine, the overall top cut-off is controlled by the top deck of Screen 2 (secondary scrubber discharge screen) and has a nominal value of 28 mm. The overall bottom cut-off is controlled by the bottom decks of Screens 3 and 4, which are de-gritting screens, and the decks on Screens 7 and 10 (DMS feed preparation screens). The overall bottom cut-off currently has a nominal value of 1.2 mm. The overall bottom cut-off must be maintained on all screens downstream that handle DMS concentrate (i.e. the sinks screens and all of the screens in the recovery plant).

In order to improve the control over the overall process plant bottom cut-off size of 1.2 mm, a stricter set of tolerances was adopted for changing out screen panels on the de-grit and feed preparation screens in October 2013. Prior to this date, panels were allowed to wear to 1.7 mm effective slot widths or greater. Since October, 2013, screen panels are inspected and changed out on more regular intervals (inspected every three weeks). This change has had a positive overall impact on plant recovery efficiency.

Figure 13-1 shows a basic flow through the process plant, highlighting the areas where the overall bottom cut-off is controlled.

Figure 13-1: Schematic Flowsheet showing the Control Points for the Bottom Cut-off



Note: Figure prepared by Dominion, 2016.

13.2.1 Incidental Fine Diamond Recovery

Any given diamond processing plant will have a specific nominal overall bottom cut-off, but will always recover some diamonds that are smaller than the bottom cut-off due to screening inefficiency. These “incidentals” are stones that are small enough to pass through the screens, but do not, because the screening process is not 100% efficient. If a screen is loaded beyond the design capacity, or the screen panels are performing poorly, the screening efficiency will decrease resulting in more fine material mis-reporting to the screen oversize stream.

13.2.2 DMS Sinks Screens

The sinks drain and rinse screens (or sinks screens) are the final washing step for all concentrate before it is transferred into the recovery plant. Material that passes through the rinse section of the sinks screens is lost to DMS effluent which is pumped to the fine processed kimberlite containment facility via the thickeners.

It is standard practice in diamond processing plants to have a sinks screen cut-off size that is one or two screen aperture sizes smaller than the overall plant bottom cut-off. The best theoretical practice is to use square aperture panels, but in reality, slotted apertures provide better drainage and ‘wear-life vs. open-area’ profiles than square panels.

In October 2013, Ekati’s processing plant sinks screen panels (mostly 1.2 mm x 14 mm long slot apertures) were replaced with 0.8 mm by 8.8 mm screen panels.

The change in screen size from 1.2 mm to 0.8 mm in October 2013 had a significant impact on the number of stones recovered in the 0.8 mm to 2.0 mm range (particularly for finer diamond distributions such as Misery).

The DMS feed preparation screen panels were changed out in May 2016 from a 0.8 mm width aperture to a 0.63 mm width aperture.

Since the modifications to the processing plant starting in late 2013, the effective size bottom cut-off is currently equivalent to the sample plant with 1.0 mm slot degrit screens. Therefore, the Mineral Reserves are reported at an equivalent cut-off of 1.0 mm. The differences in diamond qualities (price points) and size distribution (stone size frequency distributions) per source are reflected by different diamond price estimates (refer to discussions in Section 11.11 and Section 15.2).

13.2.3 Diamond Recovery Comparison – Process Plant and Bulk Sample Plant

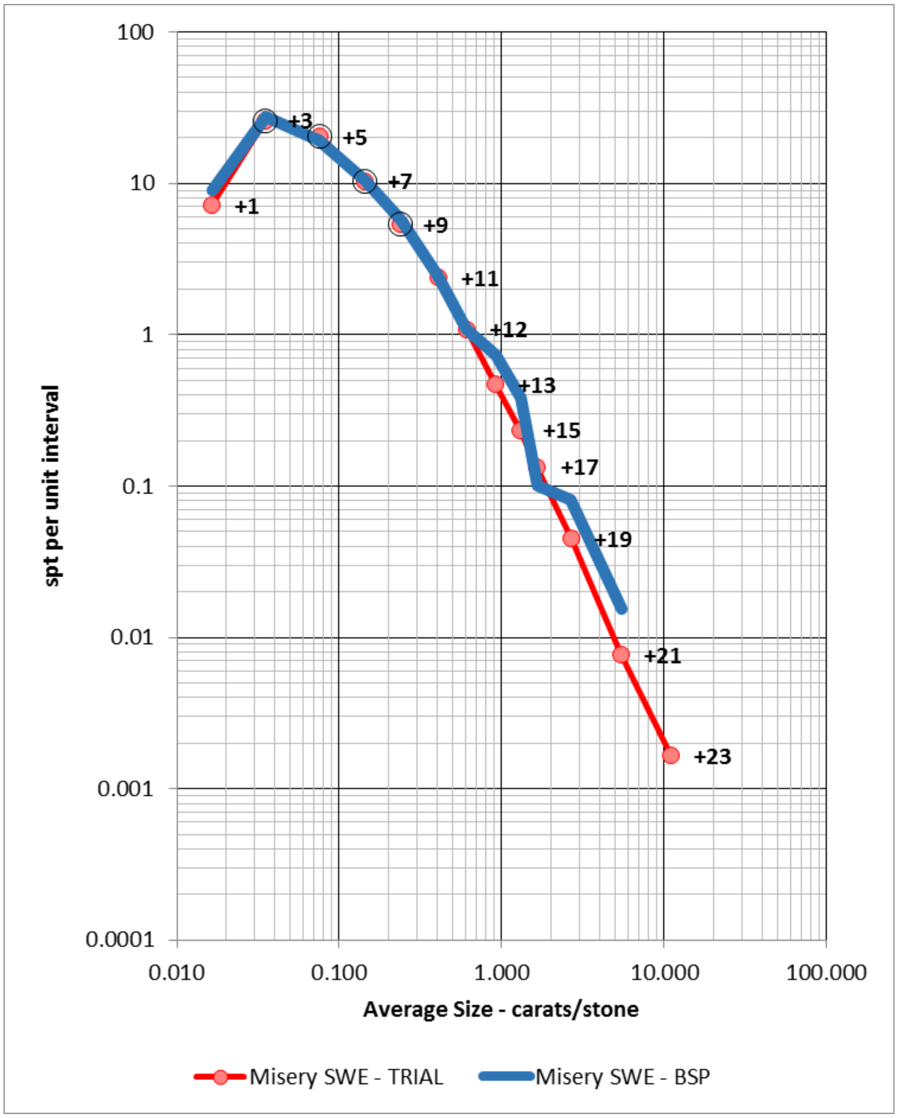
A production trial was designed during August 2015 to utilize a quantified ore source to benchmark the processing improvement initiatives that have been implemented in the main Process Plant. The trial was carried out in late September to early October, 2015 and used stockpiled kimberlite from the Misery Southwest Extension.

The Misery Southwest Extension portion of the 310 m bench (~120 kt) was excavated, hauled and stockpiled in a separate area north of the process plant. After the maintenance outage in late September 2015, the plant was purged and the trial was initiated. During the trial period from 25 September through 2 October 2015, 72,214 dmt of Misery Southwest Extension kimberlite was processed. A representative stockpile (approximately 432 dmt) of the daily process plant feed material was collected for treatment through the bulk sample plant. The bulk sample plant testing was also completed.

A total of 143,569 carats were recovered from the main production trial for an overall grade of 2.0 cpt. A representative sample of the Misery Southwest Extension trial material was processed through the on-site bulk sample plant. Approximately 784 carats were recovered from 432 dry metric tonnes for a grade of 1.8 cpt.

In order to estimate the impact of the process plant diamond recovery improvement initiatives, size frequency distributions were compared for the samples from the main process plant trial and the representative sample through the Ekati bulk sample plant (Figure 13-2).

Figure 13-2: Comparison of Size Frequency Distributions from the Misery SWE Trial of September/October 2015



Note: Figure prepared by Dominion, 2016.

The fine tails of the size frequency distributions are in very close correspondence indicating that diamond recovery is essentially equivalent between the main process plant and the bulk sample plant. The coarser end of the size frequency distribution is better constrained by the full scale production test due to the much larger sample size.

13.3 Metallurgical Variability

13.3.1 Bulk Sampling

The large-scale and bulk sampling programs described in Section 11 were used to evaluate the metallurgical variability of the kimberlite domains to be treated through the Ekati processing plant. Samples were selected from a various mining blocks within the deposits. Large bulk samples were taken for the Koala underground mine using an exploration drift and for Pigeon open pit (refer to Section 11.1).

Metallurgical testing for the Misery satellite pipes (Misery South and Misery Southwest Extension) have been based on in-pit samples (up to 100 dmt) through the Ekati sample plant. Production trials were carried out in October 2015 for Koala Underground and Misery Southwest Extension kimberlite, and in June 2016 for the Pigeon and Misery Main kimberlite sources.

Indirect metallurgical information is provided by processing of RC drill samples through the sample plant and by test work on drill core.

13.3.2 Coarse Tail Rejects

A coarse reject sample is considered to be representative of the operating conditions of the plant, and is a timed sample taken over an hour of production to represent the whole 24 hours. The variability of the results can be attributed to the sampling methodology, the variability of the grade itself, and on the performance of the recovery plant.

The coarse tail reject audits measure the performance of the main plant including the recovery circuit as the samples are taken. The performance of the plant is generally above 90% recovery of diamonds by weight and more than 96% recovery by value to an effective bottom-cut-off of 1.0 mm.

13.4 Deleterious Elements

There are no deleterious elements in diamonds processing. However, a high amount of clay and/or granite can create processing challenges.

A high clay or moisture content in kimberlite material or kimberlite fines can lead to blockages in the HPGR circuit and conveyor transfer chutes, and clumping of wet, sticky fines across the sink, de-grit and DMS feed preparation screens leading to screening in-efficiencies. Dominion typically manages the clay and moisture-rich feed through blending strategies. Additionally, a capital study is planned for FY18 (2017) for process plant front-end modifications to handle high clay content material.

The presence of granite in the feed in high content increases the recirculating load between the HPGR and the secondary scrubber due to the relative hardness of the material and decreases the quality of the feed to the DMS. It also displaces kimberlite in the plant feed which leads to the processing of material with no value. The granite in the recovery circuit is non-magnetic and sometimes fluoresces under the X-rays increasing the percentage of rejects in the final diamond concentrate. High granite content is also a concern for the sizers as it contributes to wear, damage and increases the probability of sizer stalls, resulting in plant downtime. Dominion manages the granite load by using a surface ore-sorting program to reduce waste rock feed to the plant.

Once reporting to recovery, mineralised granite can be problematic to separate from diamonds in the automated recovery circuit as it tends to be non-magnetic, and the minerals associated with the rock tend to fluoresce, resulting in ejections and contamination of the final diamond product, resulting in increased time required to hand-sort the non-diamond material from diamonds.

Tramp metal causes process delays and in-efficiencies. The current design of the underground conveyor system has four magnets, the first of which is on a wide picking belt designed to spread the muck, facilitating metal removal. The remaining magnets are located at transfer points along the underground conveyor. A metal detector is also used to identify large pieces of tramp metal. Several self-cleaning magnets and metal detectors are strategically placed on several conveyor belts within the process plant. The primary concern with respect to metal is damage to, or blockages of processing equipment (e.g. conveyor belting, crusher jams, etc.).

13.5 Comments on Mineral Processing and Metallurgical Testing

In the opinion of the responsible QPs,

- Metallurgical test work and associated analytical procedures were performed by recognized testing facilities, and the tests performed were appropriate to the mineralization type;
- Samples selected for testing were representative of the various kimberlite types and domains;
- Industry-standard studies were performed as part of process development and initial plant design. Subsequent production experience and focused investigations have guided plant expansions and process changes;

- Recovery estimates are based on appropriate metallurgical test work and confirmed with production data, and are appropriate for the various kimberlite domains;
- While there are no deleterious elements in diamonds processing, high granite or clay quantities can lead to process issues. These are managed by a combination of surface sorting and blending of different kimberlite domains;
- Development of the Jay kimberlite will require careful attention to the quantities of sediments/fines in the plant feed (refer to Section 17.5.2 and Section 17.5.3);
- Development of the Jay kimberlite will also require assessment of the overall processability of the material, and will be based primarily on additional clay characterization test work.

14.0 MINERAL RESOURCE ESTIMATES

Resource estimation is a two-step process at Ekati. The first step is to develop three-dimensional object models for key geological domains, analyse spatial sample data in relation to geological domains, and validate their application. The second step is to inform the block model variables based on the spatial distribution of the modeled data.

14.1 Geological Models

In general, kimberlite pipes are roughly ovoid in plan-view, and taper consistently at depth. Vulcan and Leapfrog software are used to develop three-dimensional wireframe models of the kimberlite pipes and internal lithological divisions. Drill hole boundary intersections and surface geophysical outlines are used to define the outer boundary. The lower limits of models are typically extended slightly beyond the lowest drill hole (RC or diamond) intersection. Internal domain boundaries are typically modelled as planar surfaces. Internal dilution (e.g. granitic xenoliths) is modelled as enclosed volumes assuming sub-rounded, sub-horizontal shapes or treated as a percent dilution of the model volume. The geological models are refined and updated with mining development and production data.

Studies of volume uncertainty using probabilistic methods have been conducted in some cases (e.g. Koala and Sable). In most cases, deterministic range cases were constructed to illustrate risk around the volume estimate.

Statistical and geostatistical analyses of grade, density, and moisture content are performed to characterize the distributions of these variables. Contact analysis is used to support both hard and soft boundaries. Data are reviewed for outliers, and outlying samples are treated depending on their genesis. All data are de-surveyed to the midpoint of the sample and no compositing is done.

14.2 Exploratory Data Analysis

All grade data are de-surveyed to the mid-point of the sample, and no compositing is undertaken.

Statistical and geostatistical analyses of grade, density, and moisture content are performed to characterize the distributions of these variables. Data are reviewed for outliers, and outlying samples are treated depending on their genesis. Contact analysis is used to determine the degree of sharing of grade data across geological boundaries during block grade estimation. Pangeos, WinGslib, Vulcan, and Snowden Supervisor software packages have been, or are currently used to analyse and characterize the data.

14.3 Block Models

Block models are built for mineral resource estimates for kimberlite pipes that are deemed to have prospects of economic extraction. Block models are periodically updated as new data are collected (e.g. completion of a drill program, diamond parcel pricing) or as required for reporting and economic studies. Table 14-1 summarizes the latest model dates for each kimberlite pipe where Mineral Resources are estimated, model block sizes and the modelling method used.

Table 14-1: Model Details

Pipe	Model Block Size (m)	Date of Latest Model Revision	Modelling Method
Koala	5 x 5 x 5	July 2016	Ordinary Kriging (OK)
Fox	15 x 15 x 10	July 2016	Simple Kriging (SK)
Misery	15 x 15 x 10	July 2016	Ordinary Kriging
Pigeon	10 x 10 x 10	July 2016	Ordinary Kriging
Sable	15 x 15 x 15	July 2016	Simple Kriging
Lynx	10 x 10 x 10	July 2016	Ordinary Kriging
Jay	15 x 15 x 15	July 2016	Simple Kriging

Vulcan software is typically used by resource geologists to create block models. Grade models are estimated using a linear estimator, such as kriging or inverse distance. Sequential Gaussian simulation (SGS) was used to quantify resource uncertainty. The results of the SGS are still relevant for risk analysis for the Koala pipe.

Block models contain an extensive set of variables to provide a mining block model suitable for both resource evaluation and mine planning. Block model variables typically include, but are not limited to, the following:

- Grade;
- Density;
- Moisture;
- Geological domain;
- Geotechnical, metallurgical, and environmental variables;
- Diamond recovery;
- Diamond price.

Where suitable, resource model block sizes are chosen to be at the selective mining unit (SMU) size and are jointly agreed to by the geologists and mining engineers. The selected SMU is appropriate to the drill hole spacing, mining production scale, and overall geometry of the pipe.

For the most recent Mineral Resource estimates for the Jay, Sable, and Fox pipes the focus was on producing robust estimates of grade per bench or level, rather than local block grade estimates, and without emphasis on SMU size. The use of simulation as an estimation tool is being replaced with simple kriging (SK) of stone density in all updated Mineral Resource estimates.

14.4 Grade Estimation/Interpolation Methods

RC sampling programs provide diamond grade and size frequency distribution data for grade estimation.

In general, the procedure for grade estimation is as follows:

- Data validation;
- Exploratory data analysis (EDA) including:
  - Visualization;
  - Univariate and multivariate statistical analyses;
  - Trend analysis;
  - Declustering;
  - Variography;
- Block grade estimation including:
  - Ordinary kriging (OK), inverse distance squared (ID2), or SK estimators
  - Validation using visualization and statistical analyses;
- Sensitivity analysis;
- Post processing and up-scaling (if required);
- Uncertainty analysis using deterministic methods or SGS (if required).

The diamond grade estimation variable is stones per metre cubed (spm^3). The spm^3 is calculated from a subset of stones over a representative set of size fractions chosen to obviate the effects of poor recovery of small stones and variability in recovery of large stones (i.e. stone density method).

Where feasible, non-mineralized units (i.e. granitic xenoliths >2 m in size) are modelled separately. Waste kimberlite, mud, and xenoliths <2 m in size are considered part of the models, and are therefore included in the Mineral Resource estimate as internal dilution.

The underlying block grade variable for the Jay, Sable, and Fox pipes is spm^3 of the stable size fraction. The spm^3 block grade is then converted to carats per metre cubed (cpm^3) using a factor to map the estimated variable onto the chosen size frequency distribution. In all other pipes grade is estimated directly from sampled cpm^3 values. Dry bulk density in t/m^3 and moisture content in percent were estimated into the block model. Block grade, expressed in carats per tonne, was calculated by dividing the block cpm^3 grade by the block dry bulk density value.

14.5 Block Model Validation

The block grade estimates were validated by visual checks of estimated block grades versus sample grades, summary statistics of estimated and declustered input grade distributions, histograms and probability plots, swath plots, scatterplots, and quantile–quantile (QQ) plots.

No significant errors or biases were identified as a result of the validation process.

14.6 Classification

Drill spacing studies were conducted to support mineral resource confidence classification. No Measured Mineral Resources have been classified. Drill hole spacing classification is as follows for all deposits, unless otherwise specified:

- Indicated – less than 60 m to nearest sample;
- Inferred – less than 90 m to nearest sample.

In certain deposits, such as Koala, the kriging variance was also used to support classification categories. In models that were estimated in 2015, the weight attributed to the mean in the SK process was used to support classification.

14.7 Estimation Methodology by Kimberlite Pipe

Mineral resource estimates vary slightly between pipes, and the details are described by kimberlite pipe in the following sub-sections.

14.7.1 Koala

A total of 194 drill holes, including 31 RC holes, 83 surface core holes, and 80 underground core holes inform the underground resource models. The 2210 m bench bulk sample, the 2050L bulk sample drift, and development samples from 1870L and 1850L provide additional geological and grade support. In total, 148 pierce points inform the Koala pipe model.

14.7.1.1. Geological Models

Seven geological domains (phases) were modelled within the Koala pipe. Phases 1 through 3 were mined out during open pit mining. A small remnant of Phase 4 kimberlite remained at the bottom of the open pit prior to underground caving operations.

Three kimberlite domains, Phases 5, 6, and 7, and granitic xenoliths were modelled for the Koala underground. Three-dimensional wireframes of the modelled units were used to back tag rock code fields within the database for EDA and block grade estimation.

14.7.1.2. Geotechnical Assessment

The key structural element of the granitoid country rocks is a complex en-echelon fault zone, called the Giant fault zone. It is interpreted to extend from west to east along approximately two-thirds of the northern margin of the Koala pipe. Variably-spaced jointing in the country rocks is believed to be associated with kimberlite cooling and/or lithification.

14.7.1.3. Variable Estimation

14.7.1.3.1. Block Models

A block model was constructed in Vulcan software for grade, dry bulk density (bulk density, density), and moisture estimation. The model uses a regular block size of 5 m x 5 m x 5 m without partial percentage or sub-blocking.

14.7.1.3.2. Bulk Density

The kimberlite bulk density database for Phases 4, 5A and 5B kimberlite consist of 579 legacy samples and 505 samples collected and processed during the Koala underground drift bulk sample program for a total of 1,084 density samples

The mean density increases with depth through Phases 4, 5A and 5B. The mean density also increases with depth through Phase 6 except near the top of the domain where the kimberlite exhibits significant and extensive alteration. There is no apparent trend with depth in Phase 7.

Outlier analysis was conducted on bulk density samples from Phases 6 and 7. Both low and high bulk density values were considered for special treatment. Values below 1.5 g/cm^3 and greater than 3.5 g/cm^3 were considered to be spurious and were eliminated from the data. In total, two low dry bulk density values, one from each of the Phase 6 and Phase 7 domains, were removed.

Continuity analysis of the bulk density sample data for Phases 6 and 7 resulted in variogram ranges of 10 m in the Z-direction of 10 m, 70 m in the X-direction, and 50 m in the Y-direction.

Block bulk density was estimated in Vulcan using OK. An ID2 estimate and a nearest neighbour (NN) interpolation were also ran for validation purposes. The average density for Phases 4, 5A, and 5B combined, is 2.00 t/m^3, the same as the density of Phase 5A. The density of Phase 6 is 25% higher and the density of Phase 7 is 33% higher than the mean of Phases 4, 5A, and 5B combined.

Three estimation passes were used to mitigate the smoothing effect of the ordinary kriging. Estimation parameters are as summarized in Table 14-2.

Table 14-2: Dry Bulk Density Estimation Parameters, Koala

Phase		Pass 1	Pass 2	Pass 3
Phase 6	Maximum Empty Adjacent Octants	6	Not applicable	Not applicable
	Minimum Number of Composites	8	6	4
	Maximum Number of Composites	24	24	24
	Maximum Number Composites per Drill hole	6	5	4
	Number of Drill Holes Required	2	2	1
	Major Axis Search Distance (m)	70	140	800
	Semi-Major Axis Search Distance (m)	50	100	571
	Minor Search Distance (m)	10	20	114
Phase 7	Maximum Empty Adjacent Octants	6	Not applicable	Not applicable
	Minimum Number of Composites	6	5	3
	Maximum Number of Composites	24	24	24
	Maximum Number Composites per Drill hole	5	4	4
	Number of Drill Holes Required	2	2	1
	Major Axis Search Distance (m)	70	140	1500
	Semi-Major Axis Search Distance (m)	50	100	1071
	Minor Search Distance (m)	10	20	214

The mean density of the Koala pipe granodiorite host rock is 2.73 t/m³. The estimate is well-supported by 181 samples and sample variance is extremely low.

14.7.1.3.3. Moisture

A moisture model was developed to assist the production scheduling of wet tonnes of ore. An OK block model estimate was generated following data analyses. A total of 1,084 kimberlite moisture samples were available for analysis. Four moisture samples from granodiorite wall rock in the core hole database were not used.

Moisture data from Phases 4, 5A, and 5B were combined into one domain for analysis, and Phases 6 and 7 were combined into a second domain.

OK was selected as the estimator for Phases 4, 5A, and 5B based on the results of the bulk density analysis and block estimate. ID2 was used to estimate moisture content in Phases 6 and 7. A strategy of two kriging passes was used. Search restrictions from the neighbourhood analysis for the density block estimate were used as a starting point for the moisture block estimate. Hard boundaries were used between the two domain groups for moisture estimation.

14.7.1.3.4. Grade

The Koala underground block grade was estimated in Vulcan using OK of RC grade samples for Phases 4 and 5A and multi-support kriging of combined RC and drift bulk samples for Phases 5B, 6 and 7.

A total of 186 RC and drift samples comprising 1,300 m^3 (3,200 t) of material were available to update the grade estimate for Phases 6 and 7. Of the total number of samples, 85 RC samples are located in Phase 6 and nine RC samples are located in Phase 7.

No capping or outlier restrictions were applied to the Phase 6 grade data. Two Phase 7 samples were capped at a value of 2.12 cpm^3 (approximately 0.8 cpt). One of the Phase 7 outliers is considered to be mixed Phase 7 and higher-grade Phase 6 material. Capping of the Phase 7 samples resulted in the mean sample grade reducing from 1.59 cpm^3 to 1.48 cpm^3 (-7%).

Only the Phase 6 domain had sufficient RC sample data to permit the calculation and modeling of a representative variogram. Drift bulk samples were not used for variography. The modelled range in the X–Y plane was approximately 70 m. The modelled range in the Z dimension was approximately 35 m, or half the X–Y distance. There were insufficient sample data to calculate and model robust variograms for Phase 7.

Block grade estimation for Phase 6 was completed using OK. The kriged estimate was validated against a NN interpolated grade model and an ID2 estimate. However, ID2 was used as the estimator for Phase 7 due to the lack of a variogram model. Grade estimates using OK and ID2 estimation were completed in three passes. The first search pass was set at the full range of the variogram, while the second and third were set at increasingly longer ranges so that after the third pass, all kimberlite blocks were estimated. Search ellipses were aligned with the directions of continuity determined by the variography. All domain boundaries were considered hard estimation boundaries with blocks estimated within these domains only by composites which lie within the domain. Parameters used in the interpolation are listed in Table 14-3.

Table 14-3: Grade Estimation Parameters, Koala

Phase		Pass 1	Pass 2	Pass 3
Phase 6	Maximum Empty Adjacent Octants	6	Not applicable	Not applicable
	Minimum Number of Composites	8	6	3
	Maximum Number of Composites	12	9	8
	Maximum Number Composites per Drill hole	4	4	4
	Number of Drill Holes Required	2	2	1
	Major Axis Search Distance (m)	70	150	300
	Semi-Major Axis Search Distance (m)	70	150	300
	Minor Search Distance (m)	35	75	150
Phase 7	Maximum Empty Adjacent Octants	6	Not applicable	Not applicable
	Minimum Number of Composites	6	5	3
	Maximum Number of Composites	8	7	7
	Maximum Number Composites per Drill hole	4	4	4
	Number of Drill Holes Required	2	2	1
	Major Axis Search Distance (m)	70	150	400
	Semi-Major Axis Search Distance (m)	70	150	400
	Minor Search Distance (m)	35	75	200

14.7.1.4. Depletion

The Koala mining depletion is calculated by subtracting annual production from the previous year-end mineral resources. The July 2016 Mineral Resource was estimated using reconciled plant production of Koala tonnes, which is simply subtracted from the previous period to report mine depletion.

Phase 5 comprises a low-grade buffer overlaying Phases 6 and 7. The sublevel cave mine plan has been designed to draw Phase 6 material, which has the highest value, preferentially over and Phases 5 and 7. Since the start of UG mining at Koala in June 2007, the caving material has mixed as expected. Therefore, material mined from a given draw-point may include components of granodiorite waste, Phase 5, Phase 6, and Phase 7 kimberlite material.

14.7.1.5. Uncertainty Assessment

Four deterministic pipe volume range models were created to assess the volume uncertainty in the estimates. Estimates did not indicate significant differences so the volume uncertainty is considered to be low.

The uncertainty of the geological domain contacts is considered to be low and will not materially impact the estimated value of the resource.

The uncertainty in the density estimate for the resource estimate for the Koala underground was evaluated using SGS, and no significant issues were identified as the results indicated low variance.

The uncertainty in the resource grade estimate was quantified using SGS of the RC and bulk sample drift samples. The global grade variability for Phase 5 (combined Phase 5A and Phase 5B) indicated that the expected average grade for Phase 5 is 0.38 cpt with a variation between ±12% within an 80% confidence interval between the ranked P10 and P90 realizations.

Samples are generally clustered in the upper central portion of Phase 6 and samples within Phase 7 do not extend to the limits of the domain. This sample dataset creates some uncertainty in the in the local estimation. The sample distribution within each domain and the spatial distribution of the samples create differences in confidence between regions in each of the domains.

The SGS results indicate that average grades in Koala Phase 6 can lie between 1.67 and 2.03 cpt, while within Koala Phase 7 the range of grades may be between 0.47 and 0.61 cpt, within an 80% confidence interval between the P10 and P90 realizations.

14.7.1.6. Initial Classification

The initial Koala underground resource classification is based on four kriging output variables that provide quantifiable measures of error, the degree of extrapolation, and sample support of the block grade estimates (Table 14-4).

Table 14-4: Kriging Output Variables Used for Koala Underground Mineral Resource Classification

Class	Conditional Bias Slope Of Regression	Kriging Efficiency	Distance (m)	Number Of Octants
Indicated	0.6 to 0.8	0.25 to 0.50	50 to 60	3 to 5
Inferred	0.3 to 0.6	0.00 to 0.25	60 to 90	2

The conditional bias slope of regression and kriging efficiency provides an indication of the amount of kriging error. The number of octants provides an indication of the amount of extrapolation. The average Cartesian distance (the average anisotropic distance was used for Phase 6) provides a measure of the sample support. A conditional bias slope of regression of 0.6 and a kriging efficiency of 0.25 were used as thresholds for classification of Indicated material. A conditional bias slope of regression threshold of 0.8 was used for Measured.

The variance of the pipe contact and geological boundaries were not considered for the provisional resource classification. However, the RC grade samples are grouped mainly in the middle of the pipe resulting in lower classification of blocks on the pipe/granodiorite contact reflecting the lower confidence in the pipe edge blocks as expected.

Classification of all kimberlite above the 1810L were made to reflect the sample density, and overall mine plan for Koala. As such, there is no Measured Resource in any of the geologic phases, and all blocks are now classified as Indicated. There were minor Inferred blocks along the margins of the pipe, which were combined with the Indicated blocks to reflect the mining method employed. This resulted in negligible changes to overall grade and tonnage.

In the January 2016 update, kimberlite from the 1810L to the 1770L was classified as an Inferred Mineral Resource.

14.7.2 Fox

The Mineral Resource estimate update consists of the remaining diatreme kimberlite only, as the crater facies material has been fully mined-out.

14.7.2.1. Geological Models

The Fox pipe geological models were created using boundary contact information from as-mined pick-ups, core holes, and selected RC holes. RC contacts were not used to reduce the pipe size as the contact cannot be confirmed to be wall rock rather than a large xenolith.

The Fox pipe model was updated to reflect the current as-mined pit surface which is now wholly within the diatreme facies. The Fox pipe model was first updated using pipe boundary contacts from wall mapping between 260 and 200 masl in the open pit. The pipe model was then clipped to the surveyed as-mined surface to produce a wireframe solid representing the remaining resource between 140 and -70 masl.

Although at least two TK domains have been recognized, the variations between these domains are slight therefore, a single TK geological model was created. However, there may be potential opportunity, in future resource updates, for improvement to the Fox geological model by modelling the unique TK domains separately and analyzing the grade and density relationships between them.

Xenoliths were initially modeled using indicator kriging, at 3:1 ellipsoid ratio, on a 3 x 3 x 3 m scale; this model was shown not to be representative during mining. The xenoliths were remodelled to increase confidence in spatial distribution of xenolith material in the mining areas. Simple inverse distance estimations on the logged granitoid were run multiple times with varying ellipsoid ratio sizes. These ellipsoids were compared to the previous model and in-pit observations of the xenoliths. Grade shells were created around reasonable estimation runs, and then the runs were merged using the best fit method.

14.7.2.2. Geotechnical Assessment

Geotechnical assessment of the remaining resource is limited to a small number (<10) oriented core holes and detailed mapping which was carried out during the open pit mining phase. There are a few general conclusions to be drawn from this historic work, including:

- Major geologic contacts in the wall rock and at the kimberlite boundary are conduits for water;
- In some areas the kimberlite boundary is relatively flat-lying (<45º), which, in conjunction with water, can cause slope instability in the kimberlite left behind from mining;
- It is imperative, in order to maintain ground stability, to provide drainage at the kimberlite boundary in areas with steep walls solely in kimberlite;
- High-angle structures in the wall rock, where they intersect, have been known to create wedge-type failures.

14.7.2.3. Variable Estimation

14.7.2.3.1. Block Models

The block model uses a regular 15 m x 15 m x 10 m block size without percentage models or sub-blocking.

14.7.2.3.2. Bulk Density

The diatreme bulk densities were obtained primarily from the underground exploration drift excavations and associated drilling. A total of 1,101 diatreme samples were collected to determine an average dry bulk density of 2.18 g/cm^3 for the entire diatreme. The bulk densities of the diatreme were divided by elevation into three distinct intervals. From the top of the diatreme (285 m) to the 157 m elevation, a dry bulk density of 2.14 g/cm^3 was averaged from 761 samples. The second elevation break, from 157 to 82 m, produced an average of 2.24 g/cm^3 from 181 samples. The lowest bulk density interval, 82 to -108 m elevation, has a value of 2.33 g/cm^3 averaged from 159 samples.

The granite bulk density determinations were divided into wall rock and xenoliths with 50 and 71 samples, respectively. The average dry bulk densities for the above granite lithologies are 2.76 and 2.70 g/cm^3, respectively, for an overall granite average of 2.73 g/cm^3. The diabase encountered was also grouped into wall rock and xenoliths. Six wall rock samples and one xenolith sample were collected with average dry bulk density of 2.91 g/cm^3.

The mean density for each facies was used to estimate tonnages.

14.7.2.3.3. Moisture

A single moisture estimate of 12% is applied across the ore body to calculate wet metric tonnes. It is recommended that for future resource updates the kimberlite moisture content is analysed and modelled.

14.7.2.3.4. Grade

A three hole, large diameter, RC program was completed at Fox in winter 2016 (see Section 10.9.2) and sample processing was in progress as at the end of July 2016. The 2016 Fox RC data shown in some drill sections (see Section 7) was not included in the current update.

A total of 620 RC samples (20 from the crater which extend into the diatreme and 600 wholly within the diatreme domain) are used in this model. Forty-three samples were excluded as they were mostly composed of granitic xenolith material. Each RC grade sample represents a 30 m interval of kimberlite. The diamonds were recovered using an effective 1 mm bottom size cut-off.

An updated resource model for Fox was created in 2014. Grade estimation was completed using a simple kriging (SK) estimator of spm^3 calculated over a stable size fraction (+3 to –9 DTC sieve sizes) of the recovered RC sample diamonds.

Outlier analysis identified a threshold of 12.0 spm^3 as high grade outliers requiring special treatment during grade estimation. The area of influence of the outliers was restricted to 15 m x 15 m x 15 m (one block) during grade estimation.

The entire parcel of diamonds was used and the stationary mean grade for use in SK was determined for the appropriate internal zone. Final block grades were determined by conversion of the estimated spm^3 block values to cpm^3 using the size frequency distribution. Grade values expressed as in cpm^3 for each block were computed by dividing the estimated cpm^3 values by the estimated bulk density.

14.7.2.4. Depletion

The Fox open pit was fully depleted in 2014. The surface wireframe meshes were created in Vulcan from available survey information including the final pit outline at the end of mining.

14.7.2.5. Uncertainty Assessment

The grade uncertainty is considered to be low in Fox. Very little variability is observed in the deposit, as determined by grade samples processed at the on-site sample plant.

14.7.2.6. Initial Classification

Mineral Resource confidence is based on weight of the mean used in the SK block estimation (weight-on-mean) and the proximity of drilling. The weight-on-mean increases quickly as the blocks get further away from the samples and is a direct measure of the uncertainty in the block grade estimate. An Indicated classification is denoted by a 0.0 to 0.7 weight-on-mean, and Inferred is denoted by 0.7 to 0.8 weight-on-mean. The initial resource classification is then assigned by bench corresponding to an overall assessment of weight-on-mean by bench.

14.7.3 Misery

14.7.3.1. Geological Models

A three-dimensional wireframe model was constructed for the Misery pipe volume estimate using Leapfrog and Vulcan. The Misery Main pipe model was modelled from in-pit mapping of the 270 masl kimberlite outline, 27 core holes (24 of which were within the resource model area), and two RC drill holes. A three-dimensional (wireframe mesh) model was constructed for all drilled bodies and lithologies. The Main pipe was modelled to -60 masl, and is constrained by 29 drill-hole contacts, with the lowest contact at -17 masl.

14.7.3.2. Geotechnical Assessment

The most prominent structures in the host rock include a northeast–southwest-trending diabase dyke and the contact between the granite and the biotite schist. Other large scale structures identified generally trend northeast–southwest (parallel to the diabase dyke), northwest–southeast (parallel to the granite-schist contact) or north–south.

Observations in the open pit suggest good quality conditions for the granite and fair to good quality for the biotite schist and diabase dyke. The granite is generally good to very good quality, decreasing slightly (becoming fair to good) near surface due to near-surface stress relief effects. The rock quality of the granite near the diabase dyke is generally classified as good. A narrow (<1 m) discontinuous zone of low rock quality granite occurs immediately adjacent to the boundary of the Misery Southwest Extension. A zone of increased fracturing is commonly observed in the granite immediately around the kimberlite satellite pipes. This increase in fracturing is also apparent at the granite-schist contact zone which is also located in the proximity to the Southeast kimberlite pipe. The diabase rock is generally of good quality, whereas the majority of the metasedimentary rocks can be classed from fair to good.

The Misery pit is monitored by two ground probe radars. These are located near the pit crest, and monitor the entire exposed wall. Ground movements can be detected to sub millimetre accuracy. A series of geotechnical and operational alarms have been established to notify geotechnical personnel of increased movement rates, and operational personnel of movements that indicate imminent failure, at which point operational personnel are removed from the mine, until geotechnical staff has cleared the alarm after inspection.

14.7.3.3. Variable Estimation

14.7.3.3.1. Block Models

Misery Main kimberlite pipe was modelled as a single domain. Given the limitations of drill hole spacing and smallest likely minable unit, a block size of 15 m x 15 m x 10 m was selected.

14.7.3.3.2. Bulk Density

The kimberlite dry bulk density database consists of 897 samples; 500 of which are from RC chips, and 397 are from diamond drill core. Data indicates two distinct density domains, materials with a dry bulk density less than 2 g/cm^3 and greater than 2 g/cm^3. This boundary is approximately coincident with the boundary between olivine-rich and olivine-poor kimberlite.

Statistical analysis indicated there is a bias in the dry bulk density values between drill core and RC dry bulk density samples. This bias was corrected by correcting the RC bulk density values by ~+0.1 g/cm$^{3.}$ The corrected RC data was combined with the drill core data for EDA and estimation. Ordinary kriging was used for block bulk density estimation. The mean bulk density for the Misery Main kimberlite is 1.92 g/cm^3 with a range of 1.12–2.68 g/cm^3. The mean dry bulk density of drill core for the satellite kimberlites and wall rock domains ranges from 1.50–2.88 g/cm^3.

14.7.3.3.3. Moisture

The moisture values were obtained using bench average moisture values, based on the trend between moisture percentage and elevation. Although most moisture data were obtained from drill core, RC data were added to the dataset by adjusting the data to account for the different drilling technique. Bench averages were calculated by binning each moisture data point based on 105 m intervals. The average moisture value for each bin was calculated and a trend line was fitted to these actual averages to determine the average moisture value for each bench. Bench averages were used versus estimations to ensure that the resource model was fit for purpose. For mining and processing calculations, a global average of 10.71% was used for the Misery Main kimberlite. The average moisture content of drill core for the satellite kimberlite and wall rock domains was 13%.

14.7.3.3.4. Grade

The grade sample database consists of 171 valid RC grade samples from the Main Pipe after 35 samples were removed due to data confidence. Confidence ratings were applied to samples based on the presence and quality of calliper data. Samples with very low confidence ratings (i.e. absent or compromised calliper data) were removed from the database. Diamond data, sample volume, and slough allocation for all samples were verified for the most recent update in 2010.

A screen cut-off of 1.2 mm was used to process the 2008 RC grade samples whereas the 1995 samples were processed at 0.5 mm. The 1995 sample grades were adjusted using a recovery factor of 0.72 before combining with the more recent data in order to produce a consistent dataset for grade estimation. Estimated diamond grades were converted to 0.5 mm slot screen to be consistent for reporting with other Ekati Mineral Resources. A factor of 1.41 was used to convert the resource block model diamond recovery from the 1.2 mm to 0.5 mm.

The deepest grade sample, referenced at the midpoint of RC bulk sample is located at -17 masl. The Misery grade estimate is based on an OK block estimate of RC sample grade reported in carats per m^3 into one geological domain.

14.7.3.4. Uncertainty Assessment

Due to the low variance and large number of dry bulk density samples, the variability in the density estimate is considered to be an insignificant component of resource risk.

The overall confidence in the volumetric estimation of the Misery pipe, based on the current geological model suggests that potential errors in global volumes are likely to be less than 10%, but variation per bench is expected to be higher. Specifically, errors are less than 4% to 90 masl, but rise to 7% below 90 masl due to lack of control information below this depth. On a bench by bench analysis, there is an increasing uncertainty with depth and the difference between the model and the average simulation per level rises from 1.4% at the 260 m level to approaching 20% at the deeper levels.

SGS was used to quantify the grade uncertainty. The results show that the uncertainty in grade increases towards the margins of pipe due to lower density sampling.

14.7.3.5. Initial Classification

Initial classification of the kimberlite was based on SGS and RC drill hole spacing.

The resource was first classified using probabilistic classification on a bench by bench basis. The result of this was the resource estimate was classified as Indicated to 130 masl and Inferred below this level.

The drill spacing study had the following spacing requirements:

- Indicated – less than 60 m to nearest sample;
- Inferred – less than 90 m to nearest sample.

Combining these methods of classification, the Mineral Resource blocks were provisionally classified as Indicated from surface to 130 masl and Inferred between 130 masl and 90 masl.

14.7.4 Misery Satellites

Several of the Misery kimberlite complex satellite bodies have undergone further exploration and evaluation as part of the Misery Expansion Project. A revised evaluation of available data for the Misery South and Southwest Extension kimberlites in June 2014 led to classification of these satellites as Inferred Mineral Resources.

The updated resource estimate for Misery South and the Misery Southwest Extension in this Report is based on evaluation work involving drill core microdiamond sampling and surface bulk sampling carried out subsequent to the June 2014 interim estimate.

14.7.4.1. Geological Models

Integration of new drilling information acquired in 2014 with existing data has resulted in revision of the previously reported geological model for Misery South and Misery Southwest Extension, involving minor adjustments to the pipe shell model and significant modification of the internal domain model.

The 3D geological models of the Misery South, Southwest Extension, Northeast and Southeast satellite bodies were constructed using Vulcan and Geovia GEMS software.

Three main kimberlite domains K2, K5 and K7 (each consisting mainly of kimberlite units KIMB2, KIMB5 and KIMB7, respectively) have been modelled, two of which extend across the previously modelled (but not drill defined) boundary between Misery South and Misery Southwest Extension. Although there is no geological boundary separating Misery South and Misery Southwest Extension, a geographic boundary has been used to subdivide the domains for reporting of resource estimates.

The current Misery South and Misery Southwest Extension model is considered to be a slightly conservative, low confidence representation of the pipe to 150 masl, below which drill control is substantially lower, and as such the volume is not sufficiently well constrained to allow for classification at an Inferred level of confidence.

Information obtained from the 2014 drill program facilitated a significant reduction in the extent of the previously modelled upper 'no geology' domain (Mineral Services, 2010). While a small portion of this historical domain remains uninformed by drilling and sampling, due to its relatively small size (6% of the Misery South and Misery Southwest Extension volume within the final pit shell), this zone has been included in the K7 domain for resource estimation purposes.

Drill core logging and petrographic analysis indicate a reasonable degree of geological continuity within the geological domains of Misery South and Misery Southwest Extension. Variable dilution from large siltstone xenoliths is apparent in K2 drill core and in conjunction with diamond results supports subdivision of K2 into sub-domains K2-S and K2-SWE for resource estimation purposes.

14.7.4.2. Volume, Bulk Density and Tonnage

Estimates of the total volume of kimberlitic material below the current surface were produced by intersecting wireframe models of the geology with the July 31, 2016 pit topography surface, and were constrained at depth to an elevation of 150 masl. Mineral Resources within the designed mine plan were constrained by intersection with the final pushback pit shell.

Dry bulk density estimates per domain were calculated as averages of sample dry bulk density values from 2014 drill cores; the estimates approximate the historical estimates used in the June 2014 resource estimate. The degree of overall resource uncertainty resulting from variability in the bulk density data is considered to be low.

14.7.4.3. Grade

The technique used for grade estimation is based on the concept of using calibrated microdiamond data to estimate diamond grade. For the Misery satellite estimates, drill core microdiamond data were used, in conjunction with micro- and macrodiamond data from bulk sampling, to estimate diamond grade for each of the domains.

Global diamond grades were estimated based on best estimate total content diamond size frequency distribution models for each geological domain. The total content size frequency distributions reflect the combined size distribution of microdiamonds and macrodiamonds within each domain. Macrodiamond data were not available for domains K5 and K7 in Misery South and Misery Southwest Extension, and in these cases estimates of grade rely largely on microdiamond results, and are thus considered of relatively lower confidence.

Recovery factors were applied to the total content size frequency distribution models to facilitate estimation of recoverable (+1.0 mm) grades. The grade estimates for Misery South and Misery Southwest Extension range from a low of 0.9 cpt for K5-S and K5-SWE to a high of 2.6 cpt for K7. Ranges in estimated grades (low- and high-case estimates) reflect potential error in the estimates determined from apparent variations in stone frequency within the geological domains and/or from evaluation of the sensitivity of the resultant grade estimate to reasonable changes in the size frequency distribution model. There is a high degree of uncertainty associated with the K7 estimate, but also the potential for significant upside to the currently modelled recoverable grade from this domain. Bulk sampling of confirmed K7 material is required to further evaluate this possibility.

14.7.5 Pigeon

14.7.5.1. Geological Models

A three-dimensional wireframe model was constructed for the Pigeon pipe using Leapfrog and Vulcan. The model is based on based on geophysical interpretation, 45 diamond drill holes, and four RC drill intersections; however, drilling in the northwest lobe is limited with one contact above 280 masl, and six below. The deepest boundary point is 7 masl, well below the planned open pit.

A series of domain shapes were created in Vulcan mainly from geological boundary contacts observed in RC chips and drill core. The geological units include:

- Upper Crater (UC) domain;
- Lower Crater (LC) domain;
- South Crater (SC) domain;
- Magmatic (MK) domain;
- Granite xenoliths inside the Pigeon pipe;
- Diabase dykes surrounding the pipe;
- Topography (Vulcan surface created as a sub-set of the mine site topographic map);
- Bedrock surface (base of overburden).

The wall-rock lithology was not modelled due to the complex nature and limited usefulness of a differentiated host rock geology model.

A model of waste xenoliths was constructed in Leapfrog from xenolith drill core intervals composited to 2 m. An anisotropic search ellipsoid ratio of 3:3:2 was used for 3D gridding in Leapfrog to represent the tabular form of the waste xenolith “rafts”.

14.7.5.2. Hydrogeological Assessment

Significant groundwater inflow has not been encountered to date at Pigeon open pit. Groundwater inflows are constantly monitored and any accumulations are pumped to the Long Lake Containment Facility.

14.7.5.3. Geotechnical Assessment

The Pigeon area has similar host rock geology to the Misery area. The schistosity, foliation, and bedding in the metasediments generally results in a greater abundance and persistence of discontinuities parallel to foliation and relic bedding which can affect pit slope stability.

14.7.5.4. Variable Estimation

14.7.5.4.1. Block Model

The block size is 10 m x 10 m x 10 m. No partial percentage or sub-blocking was used. Blocks were deemed in or out of a solid model based on the location of the centroid only.

14.7.5.4.2. Bulk Density

In total, 1,578 dry bulk density samples from 41 drill holes were utilized for the estimation. Five dry bulk density samples were not included in the analysis due to abnormally high or low values and/or suspect data values. In three cases, this was due to unreasonable moisture content values, while in two cases this was because of high density outliers greater than 3 g/cm^3.

The outlier-restricted NN declustered bulk density mean values by domain are:

- Upper Crater – 1.91 g/cm^3;
- Lower Crater – 2.21 g/cm^3;
- MK – 2.33 g/cm^3;
- South Crater – 2.27 g/cm^3.

Variogram ranges for the dry bulk density estimation were as indicated in Table 14-5.

Table 14-5: Variogram Models (Spherical), Pigeon Dry Bulk Density Estimate

	Nugget C0	Rotation (Surpac LRL, ZXY)			C1	Range A1			C2	Range A2		
		Z	X	Y		Maj	Semi	Min		Maj	Semi	Min
Upper Crater	0.30	135	0	-75	0.32	22	10	10	0.38	105	56	40
Lower Crater	0.15	0	-15	0	0.39	48	40	10	0.46	96	60	20
MK	0.20	110	15	80	0.15	77	37	28	0.65	200	81	56
South Crater	0.35	0	0	0	0.40	40	40	40	0.25	60	60	60

Dry bulk density was estimated using OK and validated using NN and ID2 models. The validation checks showed that the estimates are reasonable and honour the input data. The OK-estimated mean bulk density values by domain are:

- Upper Crater – 1.91 g/cm^3;
- Lower Crater – 2.21 g/cm^3;
- MK – 2.30 g/cm^3;
- South Crater – 2.25 g/cm^3.

14.7.5.4.3. Moisture

A total of 1,543 moisture samples from 41 drill holes were used in estimation. Samples with moisture content values less than 1% and greater than 25% were identified as outliers. Forty samples were discarded due to abnormally high or low values and/or suspect data values. The outlier-restricted NN declustered moisture mean values by domain are:

- Upper Crater – 10.65%;
- Lower Crater – 8.39%;
- MK – 4.81%;
- South Crater – 4.52%.

Table 14-6 summarizes the variogram ranges used in the moisture estimate.

Table 14-6: Variogram Models (Spherical), Pigeon Moisture Estimate

	Nugget	Rotation (Surpac LRL, ZXY)				Range A1				Range A2		
	C0	Z	X	Y	C1	Maj	Semi	Min	C2	Maj	Semi	Min
Upper Crater	0.25	65	68	63	0.20	28	28	21	0.55	135	92	55
Lower Crater	0.20	65	68	63	0.25	28	28	21	0.55	135	92	55
MK	0.20	47	-79	26	0.12	50	46	40	.68	185	109	62
South Crater	0.25	0	0	0	0.5	40	40	40	0.25	60	60	60

Moisture content was estimated using OK and validated using NN and ID2 models. The validation checks showed that the estimates are reasonable and honour the input data. The OK-estimated mean bulk density values by domain are:

- Upper Crater – 10.58%;
- Lower Crater – 7.88%;
- MK – 4.49%;
- South Crater – 5.11%.

14.7.5.4.4. Grade

The Pigeon grade model is based on a total of 310 valid grade samples from 35 RC holes. The samples are fairly evenly distributed with 172 grades samples from the Crater domains and 137 grade samples from the Magmatic (MK) domain. A total of four RC holes were drilled in the northwest lobe, generating 36 grade samples. The mid-point of the deepest grade sample is at 23 masl. Approximately 730 carats were derived from this sampling.

Approximately 15,000 carats were recovered from the open pit bulk sample collected during 2010. The diamonds recovered from the open pit bulk sample were used to validate the block grade estimate.

Samples collected near the overburden contact were not used in estimation due to contamination with overburden as well as uncertain volumes. Samples with large granite xenoliths were not used as these volumes were modelled into a separate domain and assumed to be zero grade.

Raw grade sample data were coded into the UC, LC, and MK domains. The compositing process was not allowed to utilize samples from outside the domain being composited. There are no samples in the SC domain and therefore grade was not estimated in the SC domain.

The composite length for grade was determined by analysing the sample lengths. Approximately 63% of the samples are shorter than or equal to 15 m, so this was the length utilized for all composites. Most samples have length intervals of either 15 m (60%) or 30 m (19%).

Two composting methods were used. The first method of compositing involved compositing the samples into 15 m lengths in Surpac software using a best fit algorithm within each domain. Grade composites produced using this method were used for block grade estimation. The second compositing method was used for simulation. In this case, RC samples were manually regularized to adjust for sample length. Samples greater than 20 m were split into two equal length samples with identical grade values, while shorter intervals were left at their original length.

One high-grade outlier from the Lower Crater domain was identified and removed from the dataset to prevent overstatement of the grade estimate. Sample grades were reviewed for diamond counts, sample volume, and the allocation of waste xenoliths and slough dilution.

One high grade outlier within the MK domain was considered to require capping. This sample was capped from an original value of 4.99 cpm^3 to a value of 3.25 cpm^3. The western half of the MK domain search ellipse anisotropy was adjusted and the octant restrictions on the second estimation pass within the MK domain were removed.

Variography was undertaken to analyse and model grade continuity. The experimental variograms are somewhat noisy, have relatively high nugget values, and have relatively short ranges. Geological context was utilized to assure that an appropriate direction of continuity was selected for each domain. The direction of longest continuity in the UC and LC domains was found to be generally sub-horizontal parallel to the UC–LC contact. However, the direction of greatest continuity in the MK unit was found to be in the vertical direction. The variogram models were oriented in geologically reasonable directions which generally aligned with the analysis. The UC variogram was used for both the UC and LC domains as there was insufficient data in the LC domain to complete the analysis.

Block grade estimation was completed using OK and ID2. Block model validation was done comparing the results of the grade estimation with ID2 estimation and NN interpolation. Grade estimation using OK and ID2 estimation was completed in three passes, with increasingly less conservative search parameters in each subsequent pass.

Search ellipses were aligned with the directions of continuity determined by the variography. The first search pass was set at the full range of the variogram, while the second and third were set at increasingly longer ranges so that after the third pass, all kimberlite blocks were estimated. The search ellipse for the MK was isotropic to prevent over stating grade in the relatively poorly sample western portion of the domain.

Estimation parameters are summarized in Table 14-7.

Table 14-7: Grade Estimation Parameters, Pigeon

		Pass 1	Pass 2	Pass 3
UC and LC Domains	Maximum Empty Adjacent Octants	5	6	Not applicable
	Minimum Number of Composites	5	3	2
	Maximum Number of Composites	8	8	8
	Maximum Number Composites per Drill Hole	4	2	3
	Number of Drill holes Required	2	2	1
	Major Axis Search Distance (m)	60	120	150
	Semi-Major Axis Search Distance (m)	40	80	100
	Minor Search Distance (m)	30	60	75
MK Domain	Maximum Empty Adjacent Octants	5	Not applicable	Not applicable
	Minimum Number of Composites	5	3	2
	Maximum Number of Composites	8	8	4
	Maximum Number Composites per Drill Hole	4	2	3
	Number of Drill holes Required	2	2	1
	Major Axis Search Distance (m)	80	16	240
	Semi-Major Axis Search Distance (m)	80	16	240
	Minor Search Distance (m)	80	16	240

14.7.5.5. Uncertainty Assessment

The Pigeon pipe block grade uncertainty was quantified using SGS. A simulation model was built to simulate grades expressed in cpm^3. Five realizations representing pessimistic, typical, and optimistic possibilities of grade distribution were selected from a total of 50 simulations. The simulated grades were analyzed on 15 m benches and 60 m benches. These bench intervals were used as proxies to approximate quarterly and annual mining units in order to provide assistance with classification. In addition, the simulation data were blocked at the 15 m block model size used for estimation.

The simulations indicated that, at a 95% confidence interval, average true grades in the UC domain are between 0.83 and 0.92 cpm^3. Within the MK domain, the range was between 0.93 and 1.07 cpm^3. The largest differences are likely within the LC domain where the actual grade lies between 1.03 and 1.29 cpm^3. The grade distribution within Pigeon is relatively well quantified and each domain appears to have a global uncertainty of less than +-10%. The SGS did not account for the unknown associated with larger volumes of un-sampled material in the MK domain below the 200 m level.

14.7.5.6. Initial Classification

The block classification was based on the following:

- Blocks within the UC, LC and MK domains, which lie above an elevation of 240 masl, could be classed as Measured:
  - Blocks in this zone indicate low probability of differing from the estimated values, are well supported by spatially well distributed data, and are relatively close to sample data;
  - Kimberlite volume is estimated with relatively high confidence;

- Blocks within UC, LC and MK domains which lie below this threshold but above 200 masl could be classed as Indicated:
  - Samples in this zone show slightly higher potential for differing from estimated values and are, on average, further from sample data;
  - Kimberlite volume estimates have relatively moderate confidence;

- All other blocks within the UC, LC and MK domains and above the 150 m level, could be considered as Inferred:
  - These blocks are generally estimated in the second and third pass and are relatively far from sample data and larger volumes of this material are estimated from relatively few samples;
  - Estimate of kimberlite volume has relatively lower confidence.

14.7.6 Sable

14.7.6.1. Geological Models

The Sable drill hole database contains 34 drill hole pipe boundary contacts acquired from 31 drill holes. The Sable bulk density and moisture database comprises over 600 kimberlite samples analysed for dry bulk density and moisture. A total of 37 RC sample holes provided 261 grade samples for the Sable grade estimate.

A three-dimensional topographical surface model was created in Vulcan software from 34 drill hole collar location data, the digital elevation model (DEM) and Sable Lake bathymetry data. The DEM was interpolated from the 1 m, 2 m and 5 m contour data from the 2002 Eagle Mapping airborne survey.

A three-dimensional solid model of overburden was created using Vulcan. The average overburden thickness of 1.7 m on land was reproduced by translating the DEM down by 1.7 m in elevation. The modelled overburden thickness under Sable Lake varies from approximately 5 m to 15 m.

A solid model of the diabase dyke east of the Sable pipe on the edge of the open pit area was modelled from core hole contact data. Surface meshes of the dyke hanging wall and footwall contacts were created.

A three-dimensional wireframe model was constructed for the Sable pipe volume estimate using Leapfrog automated three-dimensional radial gridding software and Vulcan. The solid-mesh pipe model was created through several iterations of 3D gridding of the geophysical outline, the drill hole kimberlite pipe boundary intersections (hard data) with additional control points (soft data) digitized manually in Vulcan.

14.7.6.2. Geotechnical Assessment

There appear to be two features that form structural domain boundaries within the proposed Sable pit area based on the analysis and interpretation of structural data in stereonets. One potential domain boundary is a fault along the long axis of Sable Lake. A second potential domain boundary is a linear structure cutting in from the east side of the southern end of Sable Lake.

The mean compressive strength of the Sable granite is approximately 123 MPa with a standard deviation of around 24 MPa. This material may be classed as strong rock. Joints within the felsic host rocks at Sable are likely quite planar and continuous. The discontinuities do not undulate substantially and have only minor interlocking of asperities. They are very tight, having a minimal joint aperture.

Most of the rock can be classed from fair to good (rock mass rating or RMR = 40 to 80). Only a small percentage of the rock mass is below RMR = 40. Areas below RMR = 40 are likely fractured due to local faulting. As this boundary (RMR = 40) is generally considered the minimum at which the rock mass will control pit slopes, it can be assumed the stability of the pit wall will be governed by structurally-controlled failures.

14.7.6.3. Variable Estimation

SGS was used in previous Mineral Resource estimate updates to quantify the uncertainty for the each of the variables: dry bulk density, moisture, grade, and volume. The E-type model, or average of the 100 SGS realizations, continues to be used for the block estimate for dry bulk density as the E-type model closely approximates an OK estimate.

14.7.6.3.1. Block Models

The current block model uses a regular 15 m x 15 m x 10 m block size without percentage models or sub-blocking.

14.7.6.3.2. Bulk Density

The Sable pipe host rock is predominantly two mica granite which has a mean dry bulk density of 2.66 g/cm^3 from 212 samples.

The kimberlite bulk density database comprises 622 samples. Bulk density samples were collected on average every 2.0 m in kimberlite. Exploratory data analysis (EDA) was conducted on the kimberlite bulk density sample data to identify and describe the distributions. The mean density across the pipe generally increases with depth.

Variograms were calculated and modelled in three directions. SGS was used for uncertainty analysis and block estimation. The SGS block estimates for bulk density was re-blocked from 5 m x 5 m x 5 m to the current block dimensions in 2014. The mean block bulk density for Sable is 2.22 g/cm^3.

14.7.6.3.3. Moisture

The Sable pipe granitic host rock moisture analyses results are very low. The minimum host rock moisture is 0.0%, the maximum is 0.74% and the mean is 0.13%. For mine planning purposes the assumed moisture content for granitic host rock is 0.0%.

Kimberlite moisture content was found to generally decrease with depth. This trend may be associated with a reduction in pore space due to compaction from the increasing load of the overlying kimberlite and/or increasing separation distance from a water source (e.g. Sable Lake).

The current block estimate for moisture was produced by taking the bench mean from the SGS E-type model.

14.7.6.3.4. Grade

The 1996 RC drill samples were processed using 0.5 mm slot de-grit screens and the 2015 RC samples were processed using 1.0 mm slot de-grit screens, respectively.

The modeled size fraction as described below was chosen to effectively normalize the two data sets to 0.5 mm slot screen.

Stones per unit volume of Pierre sieve size fractions with reliable recovery (spm^3 +7-15 sieve size) was used as the grade modeling variable.

Hard geological or grade domain boundaries were not used in the grade estimation process because EDA and geostatistical analysis showed a single size distribution for the entire pipe.

The bulk samples show a high degree of variability in the number of stones per sample. Samples in the upper quartile occur preferentially in the western half of the pipe, but this is the only apparent trend. The samples have similar stone size distribution throughout the pipe suggesting the absence of significant geological controls. The RC grade sample population used to produce the FY16 grade estimate contains 261 valid sample grades. The 183 samples collected in 1996 represented approximately 500 m^3 of kimberlite, and the 78 samples recovered in FY16 represented approximately 667 m^3 of kimberlite. The volume per sample interval was significantly higher for the 2015 program due to the much larger diameter drill holes. The RC sample grades are noticeably lower in the top 30 m of the Upper Crater and peak at about 330 masl. The average RC sample grade decreases from about 330 masl to about 285 masl.

The conclusions reached from the EDA are as follows:

- The contact between the Upper and Lower Crater lithological domains is gradational;
- The 1996 samples were run at 0.5 mm slot screen through the Koala Sample Plant in 1996, not 1.0 mm as originally assumed.

Grade estimation was performed using SK of the spm^3 in the combined +7-15 Pierre size fraction, and converting to cpm^3 grades at a 0.5 mm lower cut-off via an adjustment factor onto the overall size frequency distribution. Final grades in carats per tonne per block were then computed using the estimated block dry bulk density value. The 2016 model has a lower overall grade than the previous model. However, this will likely be largely offset by a higher diamond price estimate due to the coarser overall size frequency distribution.

14.7.6.4. Uncertainty Assessment

The radial method of quantifying kimberlite pipe volume uncertainty was used, which employs SGS to generate a set of equi-probable realizations of the boundary contact data unrolled to a two dimensional space. The minimum to maximum volume range was determined to be 20% asymmetrically distributed from -6.6 to +13.4%, and it was concluded that there was a high confidence of the pipe volume model. Two additional uncertainty analyses, with increasing soft data support, were run to determine the drill hole spacing potentially required to reduce the volume uncertainty. Results indicated that the volume uncertainty is low and no additional boundary delineation was warranted on this basis alone.

The SGS used to estimate the Sable kimberlite dry bulk density was also used to quantify the uncertainty of the estimate. The average values were calculated for each of the 100 simulations to determine the uncertainty of the average dry bulk density estimate. The expected mean is 2.22 g/cm³, with a range of 4%, distributed across the mean at -1.9% and +2.1%. The range at an 80% confidence interval is ±1%. The results of the analysis indicate very little uncertainty or risk in the kimberlite dry bulk density estimate. The uncertainty in the dry bulk density estimate increases when smaller units of production are considered. For instance, the uncertainty analysis for 15 m benches indicates considerably higher uncertainty on certain benches. The variability on the bench mean at the top of the pipe is approximately ±2% increasing to ±13% on the 345 bench. The high variability is likely related to the variability of kimberlite lithology. The associated risk to the scheduling of dry tonnage in the Upper Crater can be mitigated by collecting additional bulk density samples.

The risk assessment conducted on previous models is still applicable. The average values were calculated for each of the simulations to determine the uncertainty of the average grade. The results indicating that the risk to the grade estimate is low. In order to understand the grade variability for Sable kimberlite over production volumes the variability on a bench scale was determined. The bench-scale ranges are significantly higher than the global ranges.

Uncertainty associated with the price estimate is closely related to parcel size. The overall diamond parcel size for valuation was enlarged in 2015 from 1,024 carats to 2,234 carats.

14.7.6.5. Initial Classification

The current model has classified only Indicated Mineral Resources to 135 masl. One block model level below the lowest RC grade sample level was classified as Inferred (to 120 masl). The variance of the pipe contact and geological boundaries was not incorporated into the resource classification.

14.7.7 Jay

14.7.7.1. Geological Models

A three-dimensional wireframe model of the Jay pipe was originally constructed using Vulcan, then revised using Leapfrog 3.1 software.

The pipe boundary model construction was based on the surface geophysical outline and all kimberlite wall-rock contacts from drilling. The RC drilling accounts for three pierce points in the pipe wall, and the diamond drill holes account for the remaining 11 pierce points. The pipe boundary model was developed in plan on 15 m bench levels by digitizing polygon outlines of the pipe perimeter that best fit drill hole data and that were consistent with current understanding of kimberlite geology. A triangulated mesh was constructed in Vulcan utilizing the digitized pipe outlines. The modelled pipe wall below the current level of drilling was projected to depth at a constant slope of approximately 80°, based on the drilled portion of the pipe. The lowest contact drilled is at +35 masl and the pipe was projected to -275 masl.

The internal RVK, MIX, and VK domain boundaries were modelled from geological observations in the diamond and RC drilling. The internal domain model is supported by the RC holes, as well as by JDC-03 and JDC-16, all of which progress through the internal domains. Other diamond drill holes only intersect a single domain and are used to verify the domain model.

14.7.7.2. Geotechnical Assessment

Geotechnical and hydrogeological investigations were carried out from 2014–2016 to further assess the site geology and complete the pit slope geotechnical design. The assumption is that mining can be performed using a water containment dike with an open pit mining method.

The structural model for the proposed Jay pit indicates the occurrence of northwest–southeast and east–west trending faults. The majority of the faults identified during investigations are favourably oriented with respect to pit walls, and routine geological structural mapping may be used during mining to confirm the presence, orientation and character of faults and other large-scale structures. There is a diabase dyke that intersects the north wall of the proposed Jay pit that could potentially act as a groundwater barrier. Additional boreholes will be drilled prior to mining to improve the resolution of large-scale structures.

A local-scale numerical hydrogeological model was developed to characterize the hydrogeological conditions in the Jay area. Hydrogeological investigations indicated the presence of a zone with increased hydraulic conductivity which may result in higher inflows into the pit.

14.7.7.3. Variable Estimation

14.7.7.3.1. Block Models

The block model is an un-rotated model orthogonal to the NAD83 geographic reference system. The dimensions of the block model fully accommodate the proposed open pit mine design and enclosing dyke.

Block cell dimensions (15 m x 15 m x 15 m) were chosen on the basis of estimation accuracy, vertical sample spacing, and compatibility with mine design. RC sampling was done on 15 m breaks, but because horizontal spacing is over 50 m, it is not practical to set the block size to the horizontal sample spacing.

14.7.7.3.2. Bulk Density

Dry bulk density was estimated in the 2008 model and was not updated in the 2016 model update.

The RVK and MIX domains were combined for estimation on the basis of the EDA. The VK facies was modelled as a separate domain. A strong linear trend of increasing dry bulk density with depth was noted through the RVK-MIX domain.

Density was estimated using bench averages though the RVK-MIX domain to replicate the analysed trend, whereas a global average was applied for the VK domain.

14.7.7.3.3. Moisture

Moisture content was estimated in the 2008 model and was not revised in the 2016 model update. The moisture model honours the three geological domains, RVK, MIX and VK as per the 2008 model. A trend of decreasing moisture with depth was interpreted for the RVK domain. Moisture was estimated using bench averages through the RVK domain and global averages for the MIX and VK domains.

14.7.7.3.4. Grade

The previously-used modeling approach was to determine cpm^3 for each sample, adjust for any outlier samples, usually by capping the grade, and then interpolation using OK or SGS. This method has some limitations:

- Anomalously high values from a small amount of large stones, or if the larger size fractions are not well represented this greatly affects the cpm^3 for a sample;
- Can be significantly impacted by sample plant recovery, if the sample plant is not calibrated and cleaned properly the loss of the smaller size fractions requires manual capping of extreme values;
- Requires a factor to represent process plant performance;
- cpm^3 is a function of stone size and stone density. The first is influenced by the physical sorting process and the second is completely dependent on the diamonds sampled from the mantle as the kimberlite ascended, which are two distinct geological processes.

The method applied in the 2016 resource estimate update uses the spm^3 as the underlying grade variable, and then adjusts this to a cpm^3 grade with reference to an underlying size frequency distribution curve. The size frequency distribution curves take into account the different de-grit screen sizes used in the bulk sample plant for the three RC drilling campaigns. The variable used is not spm^3, but a subset of the entire stone size distribution of representative size classes least affected by process plant differences (the combined -17 to +9 Pierre size classes).

Estimation of spm^3 in the block model is done using SK. In the Jay pipe, there is a marked vertical trend in grades, particularly in the RVK rock type, and this is modelled by using a five-bench moving average grade as the underlying mean value.

The spm^3 grades were converted to cpm^3 grades using an assumption of the underlying stone size frequency distribution. In the Jay pipe, there are also observed trends in size distribution with depth. These trends were introduced into the model by using a different conversion factor per bench, cut-off, and domain to map estimated spm^3 grades onto final cpm^3 grades.

The revised estimated grade model was compared to the previous model. The bench average grades show reasonably close alignment. The revised model is considered a more representative and accurate estimate and draws upon a larger grade database.

14.7.7.4. Uncertainty Assessment

The current modeling approach is to use SK to model a variable based on the stone count for Pierre sieve sizes that have a reliable and robust recovery when compared to the parcel diamond size distribution curve. This method can mitigate issues such as:

- Anomalously high results from a small number of large stones;
- Sample plant recovery issues resulting in a loss of smaller size fractions.

This method has some limitations:

- Requires a large parcel on which to base the diamond distribution curve;
- Domains must be modeled appropriately and adhered to when modeling;
- Sample are not weighted by volume when modeling, samples taken with a large diameter RC drill have the same weight during modeling as samples taken with small diameter RC drilling, despite being three times the size.

14.7.7.5. Initial Classification

Initial confidence classification of the Mineral Resources was made using the SK kriging weight applied to the stationary mean with consideration given to geological and grade continuity. The weight applied to the stationary mean in the SK process is a direct representation of the amount of sampling data in proximity to an estimated block. This approach resulted in all blocks down to 45 masl being classified as Indicated Mineral Resources, with Inferred Mineral Resources between zero and 45 masl.

14.7.8 Lynx

14.7.8.1. Geological Models

The Lynx pipe boundary and internal domains were modelled from 23 diamond drill hole and 12 RC drill hole contacts. The geological model was constructed for Lynx using Leapfrog and Vulcan software.

The construction of the pipe boundary model was based on geological interpretations of the pipe shape using geophysical data and delineation and RC drilling. The model was developed in plan for each bench by digitising polygons of the pipe perimeter that is a best fit of available data. Where the data permitted significant interpretation of the position of the pipe perimeter, a conservative approach was taken and kimberlite / wall-rock contacts were generally assumed to be straight. The perimeter of the pipe near surface is reasonably well constrained by RC drilling and the detailed shallow core drilling program undertaken in 2001 (LXDC-01 to 09). However, only four drill holes intersect the pipe margins at depth resulting in considerable uncertainty in the pipe model below 350 masl.

The pipe is divided into two domains: RVK and PVK. The internal RVK/PVK boundary was modelled as a contact surface in Vulcan from geological observations in the diamond and RC drilling.

14.7.8.2. Geotechnical Assessment

Geotechnical data for Lynx pit design was collected from oriented NQ drill holes, drill core photographs, and surface lineaments from air photographs. Neither of these sources provided a complete set of data, however, were used in combination to define major and minor structural zones. These structural zones formed the basis of the pit design, and are considered to be conservative. All data sources were collected by Dominion, and interpreted by Zostrich Geotechnical.

14.7.8.3. Variable Estimation

14.7.8.3.1. Block Models

The Lynx model used a block size of 10 m x 10 m x 10 m, with no percentage or sub-blocking applied.

14.7.8.3.2. Bulk Density

The available dry bulk density data for Lynx (n = 216) were evaluated with respect to lithology (i.e. kimberlitic mudstone, mud-rich RVK, olivine-rich RVK, volcaniclastic kimberlite breccia) and elevation in the pipe.

The samples indicate broad variations in kimberlite density with elevation and lithology. In particular, while there is a large amount of overlap, olivine-rich RVK is generally denser than mud-rich RVK which, in turn, is denser than kimberlitic mudstone (KBMS). Density values for volcaniclastic kimberlite (VK) suggest an overall higher density than any of these crater-phase lithologies. This apparent difference is believed to primarily reflect the greater depth at which the VK occurs in the pipe and it is likely that the depth-corrected range in bulk density for this material is very similar to that of RVK. This is supported by the fact that RVK samples occurring at depth within the volcaniclastic phase show a significantly elevated density relative to those occurring at shallower levels. Similarly, the shallowest VK samples have density values at the lower end of the full range displayed by this material and are consistent with the density range displayed by the olivine-rich RVK at the same level in the pipe.

The Lynx pipe bulk density estimate was updated most recently in 2013. OK was used as the main estimator and ID2 was used for validation.

14.7.8.3.3. Moisture

Samples were taken from the 1999 and 2000 drill core holes for determination of bulk density and moisture content of host geology (granite) and the kimberlite density within the pipe. Two samples of approximately 6 cm (for bulk density) and 2 cm (for moisture content) in length, respectively, were taken every 2 m in kimberlite and every 10 m in granite. Density determinations used conventional water displacement methods. Moisture contents were determined based on the weight differences between samples weighed in air, then reweighed after oven-drying.

14.7.8.4. Uncertainty Assessment

No uncertainty assessment was carried out on grade. The diamond parcel size for Lynx is small (277 carats) and this represents the greatest area of uncertainty for the Mineral Resource estimate.

14.7.8.5. Initial Classification

Blocks are classified as either Indicated or Inferred Mineral Resources, based on the distance to the nearest sample grade point.

14.8 Final Classification of Mineral Resources

The responsible QPs use pipe-by-pipe risk assessments to qualify mineral resources. Each pipe is evaluated based on grade continuity, internal geological continuity and understanding, sample density, dry bulk density by geologic domain, moisture, and diamond evaluation parcel size. Consideration is given to geotechnical conditions, either known or postulated in the surrounding country rock, and if possible, the processing characteristics of the kimberlite.

14.8.1 Koala

The resource is constrained vertically at the 1770L by decreasing tonnes available per developed underground level due to deposit size and geometry.

All resources within the planned mine area are classified as Indicated in the current model. The size of the evaluation parcel, and grade uncertainty due to decreasing sample points with depth are the main considerations for this classification.

A diamond drilling program was carried out on the 1830L during 2015 (see Section 10.9.1). The geological solids were updated and the kimberlite pipe shell was modeled from 1810L down to 1770L. There was no new grade or density data. However, microdiamond testing validated inference of Phase 6 and 7 grades to the deeper levels. On the basis of additional geological domain contacts, pipe wall contacts and grade inference, approximately 0.3 million dmt of kimberlite (at 1.7 cpt) is reported as Inferred for the 1790L and 1770L.

14.8.2 Fox

The Mineral Resources at Fox are classified as Indicated and Inferred, assuming a conceptual underground mining operation.

14.8.3 Misery

Although the pipe is extensively drilled with tight RC drill hole density, there is uncertainty associated with sample grade variability, excessive kimberlite sloughing in some RC holes, and use of different de-grit slot sizes in the sample plant for the various RC campaigns (0.5 mm slot for 1995, 1.2 mm slot for 2008). The resource estimate is limited to 90 m RL based on a maximum Whittle assessment and the option to apply a small underground operation or an alternative mining method.

The confidence in the Misery Mineral Resource estimate is classified as Indicated to 130 masl, with Inferred from 130 masl to 90 masl, given the results of probabilistic grade analysis combined with other risk assessment criteria.

14.8.4 Misery Southwest Extension and Misery South

The Misery Southwest Extension and Misery South pipes are located in close proximity to the Misery Main pipe (see Figure 7-7). The extents of the modeled pipes within the planned Misery pushback pit are entirely classified as Inferred Mineral Resources on the basis of limited diamond drilling and grade sampling.

14.8.5 Pigeon

Pigeon Mineral Resources are classified primarily as Indicated with a small amount of Inferred. This classification is based primarily on the confidence in the locations of the contacts in the northwestern portion of the pipe along with other risk assessment criteria.

The Indicated Mineral Resource estimate is limited to 200 masl, while Inferred Mineral Resources are defined between 200 and 150 masl.

14.8.6 Sable

All Sable Mineral Resources are classified as Indicated with the exception of a small amount of Inferred Mineral Resources at depth. This is due to the relatively small diamond evaluation parcel size, uncertainty in internal geology, and few bulk density samples below 250 masl. The Indicated Mineral Resource is limited to 135 masl as this is the lowest confirmed kimberlite intersection, while Inferred Mineral Resources are defined between 120 m and 135 masl.

14.8.7 Jay

The Mineral Resources for Jay are considered to be Indicated from the top of the pipe to 45 masl (the depth of the deepest RC sample) with Inferred defined from 45 to 0 masl. This is due to the relatively small overall diamond parcel (~4,123 carats) and limited information on internal geology and low number of bulk density samples.

14.8.8 Lynx

The Mineral Resources for the Lynx pipe are classified as Indicated to 260 masl and Inferred from 260 and 180 masl. The main criterion for the Mineral Resource confidence classification is the relatively small diamond evaluation parcel (~270 carats).

14.9 Reasonable Prospects of Eventual Economic Extraction

14.9.1 Diamond Recovery at 0.5 mm

A slot screen size cut-off of 0.5 mm is used and a 100% recovery factor for Ekati Mineral Resources. From 2016 onward, Mineral Resources at Ekati are reported assuming a slot screen size cut-off of 0.5 mm. This allows for determination of Mineral Reserves that include additional diamond recovery from the planned Fines DMS plant, as discussed in Section 11.11.

Conversion of Mineral Resource block model grades to reflect recovery at a 0.5 mm slot screen size is done by comparative analysis of size frequency distribution data, and adjustment factors determined for each pipe as in Table 14-8.

Table 14-8: Diamond Recovery Factors to 0.5 mm as at 31 July, 2016

Joint Venture Agreement Area	Kimberlite Pipe and Domain	Conversion Factor from Mineral Resource Block Model
Core Zone	Koala Ph5 (RVK)	1.19
	Koala Ph6 (VK)	1.18
	Koala Ph7 (VK/MK)	1.21
	Fox TK	1.13
	Misery Main	1.35
	Misery SW Ext	1.29
	Misery South	1.13
	Pigeon RVK	1.01
	Pigeon MK	1.00
	Sable	1.00
Buffer Zone	Jay RVK, VK	1.00
	Lynx	1.00

Notes to Accompany Diamond Recovery Factor Table:

1. For many pipes, block model grade estimates assumed a 1.0 mm slot screen recovery, and need to be adjusted upwards to reflect a 0.5 mm assumption;
2. For block models estimated more recently (Sable and Jay) an assumption of 0.5 mm slot screen recovery was embedded into the model, meaning that no adjustment is required.

14.9.2 Diamond Reference Price

Kimberlite value (US$/tonne) is equal to average grade (carats per tonne) multiplied by average diamond price (US$/carat) multiplied by a recovery factor.

The diamond price estimate is relatively complicated compared to most commodities. Diamonds occur in a vast array of sizes, colours and qualities with a price variation up to three orders of magnitude for a single diamond size. Diamonds within a kimberlite can range in quality from very low-value boart (fibrous diamond) to very high gem-quality stones. More than 12,000 categories comprise the current Dominion Price Book. The average diamond price is a function of diamond size distribution and diamond quality/colour. The highest-value populations (e.g. Koala) have both a coarse size distribution and high proportion of high-quality white stones.

Uncertainty associated with diamond price estimation is related directly to parcel size assuming a detailed, well constrained value sort. The uncertainty due to parcel size can be estimated using Monte Carlo random testing of very large production parcels. The ideal parcel size for commercial kimberlite evaluation is approximately

5,000 carats. However, there are cost and time constraints in obtaining very large diamond parcels at Ekati due to the difficult setting of the pipes (typically situated in lakes with >10 m of glacial overburden) and the remote location of the mine. The evaluation is sequential due to multiple pipe development and time constraints (e.g. winter bulk sampling programs).

The valuation of the diamond parcels is periodically updated to a more recent Price Book to ensure that the diamond prices are representative of current sorting categories and market conditions. Prices in the Price Book are updated with each sale. To facilitate economic analysis, all the pipe valuations are carried out on a common fixed Price Book, and the Diamond Price Index is then applied to reflect market movement relative to the date when the Price Book was set. For planning purposes these reference prices are estimated on an annual basis and as reference prices for application of the escalated price forecast.

The diamond price is estimated for each size cut-off using exploration or production sample parcels, as described in Section 11.11, and stone frequency distributions. The average diamond price (diamond reference price) is estimated for each pipe (and in some cases multiple geological domains within a pipe) using exploration and/or production parcels ranging in size from several hundred carats to tens of thousands of carats. These diamond parcels have been valued on Dominion's Price Book and are adjusted for current market conditions.

Dominion has modelled the approximate rough diamond price per carat for Mineral Resources for each of the Ekati kimberlite types, shown in Table 14-9 using the diamond reference prices from Dominion's June 2016 Price Book for the exploration and production parcels and adjusted to a 0.5 mm slot lower cut-off size.

Table 14-9: Diamond Reference Price Assumptions for Mineral Resources as at 31 July, 2016

Joint Venture Agreement Area	Kimberlite Pipe and Domain	US$/carat at 0.5 mm
Core Zone	Koala Ph5 (RVK)	$243
	Koala Ph6 (VK)	$296
	Koala Ph7 (VK/MK)	$311
	Fox TK	$241
	Misery Main	$64
	Misery SW Ext	$37
	Misery South	$49
	Pigeon RVK	$154
	Pigeon MK	$149
	Sable	$128
Buffer Zone	Jay RVK	$56
	Jay VK	$49
	Lynx RVK/VK	$230

Notes to Accompany Diamond Reference Price Table:

1. Diamond reference price is based upon diamonds that would be recovered by the Ekati Bulk Sample Plant using 0.5 mm width slot de-grit screens and retained on a 1.0 mm circular aperture screen.

14.9.3 Conceptual Mine Designs for Resource Reporting

Conceptual pit designs for Mineral Resources amenable to open pit mining methods (Misery, Pigeon, Sable, Jay and Lynx) were completed using Whittle shell analysis. Parameters used in pit shell analysis varied by kimberlite, and ranges included:

- Overall pit slope angles vary considerably and were selected to meet the particular design requirements for each pipe, ranging from 35–62º;
- Mining cost assumptions of $5–8/wmt;
- Processing costs of $16–26/dmt;
- G&A of costs $17–29/dmt.

Conceptual underground designs for Koala were based on a sub-level cave mining method utilising 20 m sub-levels and a $38–63/dmt operating cost range, which was also dependent on elevation.

Conceptual underground designs for Fox were based on a 130 m deep block cave mining method and a $50–84/dmt operating cost range.

14.9.4 Stockpiles

The classification of stockpiles is based on the resource classification for each source. Active stockpiles were surveyed at the end of July 2016. A number of active run of mine stockpiles are included in the end July 2016 stockpile estimates. Stockpiles are from Misery Main, Misery South, Misery Southwest Extension, Koala, Fox, and Pigeon.

14.10 Mineral Resource Statement

This Mineral Resource statement is reported in accordance with the 2014 CIM Definition Standards. Mineral Resources take into account geologic, mining, processing and economic constraints, and have been defined within a conceptual stope design or a conceptual open pit shell. Depletion has been included in the estimates. No Measured Mineral Resources are reported.

The qualified person for the Mineral Resource estimate is Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd, an independent mining consultancy.

Mineral Resources are reported inclusive of Mineral Reserves. Dominion cautions that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Mineral Resource estimates are presented in Table 14-10 by kimberlite pipe. Mineral Resource estimates for the stockpiles are provided in Table 14-11 by stockpile. This stockpile table is not additive to the Mineral Resource estimates in Table 14-10.

Mineral Resources are reported effective 31 July, 2016 on a 100% basis. As at 31 July, 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.

Table 14-10: Mineral Resource Statement

Classification	Joint Venture Agreement Area	Kimberlite Pipe	Tonnes (millions)	Grade (cpt)	Carats (millions)
Indicated	Core Zone	Koala Underground	4.8	0.9	4.3
		Fox Underground	35.2	0.3	11.6
		Misery Main	3.4	5.4	18.3
		Pigeon	11.0	0.5	5.5
		Sable	15.4	0.9	14.3
		Stockpiles	1.0	1.1	1.1
Subtotal Indicated (Core Zone only)			*70.7*	*0.8*	*55.1*
Indicated	Buffer Zone	Jay	48.1	1.9	89.8
		Lynx	1.3	0.8	1.1
Subtotal Indicated (Buffer Zone only)			*49.5*	*1.8*	*90.9*
Total Indicated			***120.2***	***1.2***	***145.9***
Inferred	Core Zone	Koala Underground	0.3	1.7	0.6
		Fox Underground	2.0	0.4	0.8
		Misery Main	0.8	3.5	2.8
		Misery South	0.1	1.1	0.1
		Misery Southwest Extension	0.9	2.9	2.5
		Pigeon	1.7	0.4	0.8
		Sable	0.3	1.0	0.3
		Stockpiles	6.9	0.3	1.9
Subtotal Inferred (Core Zone)			*12.9*	*0.8*	*9.7*
Inferred	Buffer Zone	Jay	4.2	2.1	8.7
		Lynx	0.2	0.7	0.2
Subtotal Inferred (Buffer Zone)			*4.4*	*2.0*	*8.9*
Total Inferred			***17.3***	***1.1***	***18.6***

Notes to Accompany Mineral Resource Table.

1. Mineral Resources have an effective date of 31 July 2016. The Mineral Resources estimate was prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy. Mr. Ravenscroft is a Qualified Person within the meaning of National Instrument 43-101.
2. Mineral Resources are reported on a 100% basis. As at 31 July 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.
3. Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4. Mineral Resources are reported at +0.5 mm (based upon diamonds that would be recovered by the Ekati Bulk Sample Plant if it was operated with an effective 0.5 mm lower cut-off size) and retained on a 1.0 mm circular aperture screen.

5. Mineral Resources have been classified using a rating system that considers drill hole spacing, volume and moisture models, grade, internal geology and diamond valuation, mineral tenure, processing characteristics and geotechnical and hydrogeological factors, and, depending on the pipe, may also include kriging variance.
6. Mineral Resources amenable to open pit mining methods include Misery, Pigeon, Sable, Jay and Lynx. Conceptual pit designs for open cut Mineral Resources (Misery, Pigeon, Sable, Jay and Lynx) were completed using Whittle shell analysis. Parameters used in pit shell analysis varied by kimberlite and ranges included: overall pit slope angles were selected to meet the particular design requirements for each pipe and range from 35–62º, mining costs of C$5–8/wmt, processing costs of C$16–26/dmt, general and administrative costs of C$17-29/dmt and diamond valuations that ranged from US$37–$230 per carat.
7. Mineral Resources amenable to underground mining methods include Koala and Fox Underground. Conceptual underground designs for Koala were based on a sub-level cave mining method utilising 20 m sub-levels and C$38–63/dmt operating cost. Conceptual underground designs for Fox were based on a 130 m deep block cave mining method and C$50-84/dmt operating cost. Operating costs vary by elevation within the deposits. Diamond valuations ranged from US$231–$311 per carat.
8. Stockpiles are located near the Fox open pit and were mined from the uppermost portion of the Fox open pit operation (crater domain kimberlite). Run-of-mine stockpiles (underground and open pit) are maintained at or near the process plant and are available to maintain blending of kimberlite sources to the plant.
9. Tonnes are reported as millions of metric tonnes, diamond grades as carats per tonne (cpt), and contained diamond carats as millions of contained carats.
10. Tables may not sum as totals have been rounded in accordance with reporting guidelines.

Table 14-11: Mineral Resources in Stockpiles by Area

Classification	Joint Venture Agreement Area	Kimberlite Pipe	Tonnes (millions)	Grade (cpt)	Carats (millions)
Indicated	Core Zone	Koala Underground	0.2	0.7	0.1
		Misery Main	0.1	5.3	0.7
		Pigeon	0.7	0.4	0.3
Total Indicated			***1.0***	***1.1***	***1.1***
Inferred	Core Zone	Misery South	0.1	1.5	0.1
		Misery Southwest Extension	0.2	2.8	0.6
		Fox LG	0.2	0.2	0.04
		Fox VLG	6.4	0.2	1.1
Total Inferred			***6.8***	***0.3***	***1.9***

Notes to Accompany Mineral Resource Table for Stockpiles.

1. Mineral Resources in the stockpiles in this table are not additive to the Mineral Resources in Table 14-10.
2. Mineral Resources have an effective date of 31 July 2016. The Mineral Resources estimate was prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy. Mr. Ravenscroft is a Qualified Person within the meaning of National Instrument 43-101.
3. Mineral Resources are reported on a 100% basis. As at 31 July, 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.
4. Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Mineral Resources are reported at +0.5 mm (based upon diamonds that would be recovered by the Ekati Bulk Sample Plant if it was operated with an effective 0.5 mm lower cut-off size and retained on a 1.0 mm circular aperture screen).

6. Stockpiles are located near the Fox open pit and were mined from the uppermost portion of the Fox open pit operation (crater domain kimberlite). Run-of-mine stockpiles (underground and open pit) are maintained at or near the process plant and are available to maintain blending of kimberlite sources to the plant.
7. Tonnes are reported as millions of metric tonnes, diamond grades as carats per tonne (cpt), and contained diamond carats as millions of contained carats. LG = low grade, VLG = very low grade.
8. Tables may not sum as totals have been rounded in accordance with reporting guidelines.

14.11 Factors That May Affect the Mineral Resource Estimates

Factors which may affect the Mineral Resource estimates include:

- Diamond price and valuation assumptions;
- Changes to the assumptions used to estimate diamond carat content (e.g. bulk density estimation, grade model methodology);
- Geological interpretation (internal kimberlite domains and/or pipe contacts);
- Changes to design parameter assumptions that pertain to block cave designs;
- Changes to design parameter assumptions that pertain to open pit design;
- Changes to geotechnical, mining assumptions;
- Changes to process plant recovery estimates if the diamond size in certain domains is finer or coarser than currently assumed;
- The effect of different sample-support sizes between RC drilling and underground sampling or other larger-scale sampling programs;
- Diamond parcel sizes for the pipes with estimates that are not in production or planned for production.

14.12 Targets for Further Exploration

Two targets for further exploration have been estimated, based on the allowance in National instrument 43-101 Section 2.3 (2) to report the potential quantity and grade, expressed as ranges, of a target for further exploration.

Dominion cautions that the potential quantity and grade of the target for additional exploration is conceptual in nature. There has been insufficient exploration and/or study to define the target for additional exploration as Mineral Resources, and it is uncertain if additional exploration will result in the target for additional exploration being delineated as Mineral Resources.

14.12.1 Coarse Reject Material

Since the start of production in September 1998, a number of changes and upgrades have been made to the Ekati process plant. One of the key operating parameters for the process plant is the configuration of the de-grit screens and DMS sink screens. Selection of the optimum de-grit screen size (slot screen aperture) is based on diamond recovery considerations and overall process plant throughput feed constraints (smaller slot screen apertures may limit the front end capacity of the process plant). The current de-grit screens at the process plant have a slot aperture width of 1.2 mm and have been operating at this configuration since July 2007, when the slot screen aperture width was reduced from 1.6 mm to 1.2 mm. The configuration of the DMS sink screens impacts recovery of incidental diamonds. The DMS sink slot screen apertures were reduced from mainly 1.2 mm width to 0.85 mm width in October 2013 (refer to Section 13.2).

A second key operating parameter impacting diamond recovery is the re-crush circuit. The process plant can relatively easily be configured to enhance diamond recovery by re-crushing -25 mm DMS float material. The -25 mm fragments can be re-directed to the HPGR by changing several screens on the top decks of the DMS. Re-crush of the DMS floats improves diamond recovery by liberating small diamonds in the float chips. However, the use of the re-crush circuit can negatively impact overall plant throughput rates by creating a bottleneck at the HPGR. Consequently, the re-crush circuit was only historically sporadically used at Ekati.

The final contributing factor to the potential loss of diamonds to the coarse reject tails is the feed grade (and stone size distribution) to the process plant. Historically, the process plant has been fed kimberlite from a wide variety of source kimberlite pipes and geological domains. The periods of greatest interest are the production months from the high-grade areas of the Koala open pit and the original Misery open pit.

Thus, in taking all of these factors into consideration it can be concluded that the timeframe for when there would be the greatest potential of diamond grade in the coarse rejects would be from February 2003 through until September 2006.

The tonnage estimate of the tail rejects is based on truck counts (Wenco system). The preliminary grade estimate was based on reconciling loss from the head feed using the recovery partition curves (i.e. diamonds passing through a 1.6 mm slot) plus an estimate of diamonds locked in the -25 mm DMS float chips (approximated at 10% of head feed grade based on re-crush tests). The Wenco data on the trucks included coordinates of where the material was dumped along with the date of the material which enables Dominion to determine approximately where the highest potential material is located.

A production test for grade and diamond recovery was completed in November 2013. A sample of 20,734 dmt was excavated from the coarse rejects dump and was treated through the main processing plant using the existing operating parameters (1.2 mm slot de-grit screens, 0.85 mm slot aperture DMS sink screens). The re-crush circuit was not deployed. A total of 12,931 carats were recovered for an overall grade of 0.62 cpt. The diamond parcel was valued on the July 2013 Dominion Price Book and an average price of US$93 per carat was obtained. The parcel was re-priced on the June 2016 Dominion Price Book at an average price of US$84 per carat.

Coarse reject material was introduced to the plant feed in July 2014. During FY15, approximately 459,000 carats were recovered from 704,000 dmt of coarse rejects as incremental feed to the Ekati processing plant. During FY16, approximately 807,000 carats were recovered from 1,216,000 dmt of coarse rejects as incremental feed to the Ekati processing plant. There were no coarse rejects processed in 1H FY17.

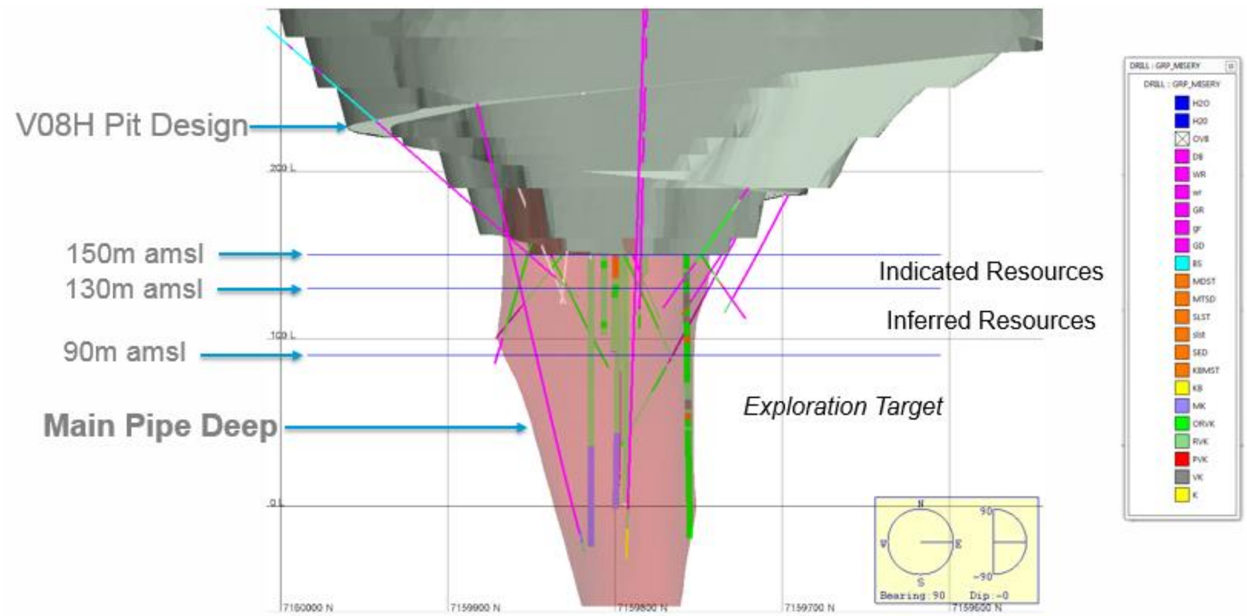
Based on the production trial, modeling and depletion, the tonnage, grade and diamond price of the remaining coarse rejects is estimated at 1.0 to 2.0 million dmt at 0.4 to 0.8 cpt and US$60 to $115 per carat, respectively.

14.12.2 Misery Deep

As detailed in Section 14.6.3, Indicated Mineral Resources are estimated below the planned Misery pit bottom (150 masl) to 130 masl and Inferred Mineral Resources are estimated from 130 masl to 90 masl. The portion of the pipe below 90 masl (to -60 masl) is considered a target for further exploration.

The Misery Deep exploration target is defined by four RC drill holes and four diamond drill holes. There are four pierce points constraining pipe volume below 90 masl. The lowest elevation pierce point is at -22 masl (Figure 14-1).

Figure 14-1: Long Section showing Misery Deep Area Relative to Existing Drill Holes



Note: Figure prepared by Dominion, 2016.

Based on the current drilling information and production sampling of Misery Main kimberlite, the tonnage, grade and diamond price of the Misery Deep exploration target (i.e. excluding the Indicated and Inferred Mineral Resources estimated above 90 masl) is estimated at 1.2 to 2.5 million dmt at 2.0 to 5.0 cpt and US$50 to $80 per carat, respectively.

14.13 Comments on Mineral Resource Estimates

The responsible QPs are of the opinion that the Mineral Resources for the Ekati Mine have been estimated to industry best practices, and conform to the definitions in CIM (2014).

15.0 MINERAL RESERVE ESTIMATES

15.1 Estimate Basis

Mineral Reserve estimation is based on Indicated Mineral Resources and is generally supported by either a pre-feasibility-level or a feasibility-level study. Mineral Reserves were estimated for the Koala, Misery Main, Pigeon, Sable, Jay and Lynx pipes, and active stockpile materials. Koala is mined as a sub-level/incline cave (SLC), similar to a block cave. The Misery open pit is undergoing a pushback, and the phase one pit completed at Pigeon open pit in early 2016. Pre-stripping is underway at Lynx whereas mining has not yet commenced at the Sable and Jay pits. The Panda, Koala, Beartooth and Fox open pits are mined out. The Panda and Koala North underground mines are also fully depleted.

Geotechnical parameters used during open pit mine design include inter-ramp and inter-bench angles, structural domains determined from wall mapping, and geotechnical drilling. Underground geotechnical considerations are more focused on ground support, and monitoring of ground movement.

There are two types of waste dilution for the Ekati kimberlites; one is accounted for in the Mineral Resource block model and Mineral Resource estimate and the second is applied as part of Mineral Reserve estimation. These are:

- Internal (geological) dilution: This is a result of blocks of barren granitic rock (xenoliths) or low grade mud/siltstone-rich zones scattered randomly within the kimberlite that cannot be separated during mining. The method of sampling to date takes into account dilution in the overall resource grade estimate;
- External (mining or contact) dilution: This is a result of blast over break, and/or sloughing of country rock at the kimberlite pipe contact, and is applied during the Mineral Reserve estimation process.

In general, excessive external waste dilution by wall rock is minimized by controlled blasting practices and pre-sorting in the open pit or stockpile area. A production geologist controls accidental (mucking/dumping) and xenolithic waste rock dilution through small equipment sorting at the kimberlite feed stockpiles. During this process, mining recovery losses can occur.

15.2 Diamond Recovery and Price Estimates

Diamond recovery factors are applied based on parameters established during evaluation of recovered diamonds collected from bulk samples, and are specific to each kimberlite deposit and contained geologic domain. The process plant currently uses 1.2 mm slotted de-grit screen sizes and 0.85 mm slot DMS sink screens. The overall diamond recovery for the processing plant is effectively 100% relative to the Ekati sample plant which uses 1.0 mm slot de-grit screen sizes (refer to Section 13.2). Ekati Mineral Resources are reported at 0.5 mm slot screen cut-off (refer to Section 14.7). For the Ekati Mineral Reserves, a diamond recovery factor is applied to normalize the grade from 0.5 mm slot screen basis to an effective 1.0 mm slot screen basis. In addition, from the start of FY18, Ekati will be operating a new Fines DMS circuit (see Section 17.3) which will provide additional recovery of diamonds in the -3+1 and -5+3 DTC size classes.

Estimated grade recovery factors, relative to the Mineral Resource grades, are determined from comparative analysis of diamond size frequency distributions (Table 15-1). The operating case plan only calls for the processing of Koala underground and Misery Main ore sources during 2H FY17 as shown in Table 15.1. For Misery South and Misery Southwest Extension (mineralization that is included in the Operating Case Mine Plan, but not reported as Mineral Reserves), the conversion factors and prices inclusive of Fines DMS are 96% at US$50 per carat and 96% at US$38 per carat, respectively.

Table 15-1: Diamond Recovery Factors for Conversion to Mineral Reserves

Joint Venture Agreement Area	Kimberlite Pipe and Domain	Conversion Factor for 2H FY17	Conversion Factor from FY18 with Fines DMS
Core Zone	Koala Ph5 (RVK)	84%	96%
	Koala Ph6 (VK)	85%	96%
	Koala Ph7 (VK/MK)	86%	96%
	Misery Main	84%	96%
	Pigeon RVK	---	99%
	Pigeon MK	---	98%
	Sable	—	96%
Buffer Zone	Jay RVK	—	99%
	Jay VK	—	97%
	Lynx	—	98%

Notes to Accompany Diamond Recovery Factor Table:

1. For pipes that will not be processed in 2H FY17, only a conversion factor including Fines DMS is given.

With the changes to recovery of smaller stones provided by changes to lower cut-off size, adjustments must also be made to average price estimates. Using the adjusted size frequency distributions and the reference diamond price curves for each pipe, estimated reference prices for Mineral Reserves are as shown in Table 15-2.

Table 15-2: Diamond Reference Price Assumptions for Mineral Reserves as at 31 July 2016

Joint Venture Agreement Area	Kimberlite Pipe and Domain	Reference Price for 2H FY17 (US$/carat)	Reference Price from FY18 with Fines DMS (US$/carat)
Core Zone	Koala Ph5 (RVK)	$284	$252
	Koala Ph6 (VK)	$344	$307
	Koala Ph7 (VK/MK)	$359	$322
	Misery Main	$71	$65
	Pigeon RVK	---	$155
	Pigeon MK	---	$151
	Sable	—	$132
Buffer Zone	Jay RVK	—	$57
	Jay VK		$50
	Lynx	—	$234

Notes to Accompany Diamond Reference Price Table:

1. For pipes that will not be processed in 2H FY17, only a price including Fines DMS is given.

15.3 Mineral Reserve Estimation – Open Pits

15.3.1 Mineral Reserve Estimation Procedure

Dominion uses a Whittle optimizer based on the Lerchs–Grossmann (LG) algorithm to determine the optimum pit shell for surface mining. The maximum profit pit size for an orebody is determined based on the grades in the geological model, pit slopes, and the economic price/cost assumptions employed for the analysis.

The optimum pit shell analysis is used as the basis of a pit design constructed with parameters such as ramp width, grade and bench angles as outlined in Section 16. Using the current mine pit design and geological block model a set of mine quantities are calculated. Mine quantities are imported into the mine scheduling software after the various diamond recovery, mining recovery and dilution factors have been applied to estimate the Mineral Reserve.

Production scheduling of the Mineral Reserve is achieved by considering mining rules (e.g. equipment allocation, development sequence, bench progression rate, process dependencies such as bench preparation, drilling, loading, and blasting) and capacity constraints while seeking to achieve production targets, which may be plant feed, total material movement, or truck hours.

There is a clear, visible, hardness distinction between the kimberlite material and the granite/metasediment host rock which allows for effective ore:waste determination. Open pit production sequencing practises have reduced the waste dilution in the Ekati open pits by taking kimberlite first, applying stand-off blasting practices from the contact, and using the excavators to 'scrape' the contact clean. If mechanical sorting of the blasted material is required as in cases of excessive wall rock dilution, it is done under supervision of the production geologist.

Dilution and mining recovery factors for the Misery, Pigeon, Sable, Lynx, and Jay open pits are summarised in Table 15-3.

Table 15-3: Summary of Dilution and Mining Recovery Factors For Open Pit Operations

Open Pit	Dilution	Mining Recovery (of diluted waste)
Misery	4%	98%
Pigeon	6%	98%
Sable	2%	98%
Lynx	<2%	98%
Jay	2%	98%

The dilution and mining recovery factors for open pit operations have been applied based on operating experience gained since mining commenced in 1998.

15.3.2 Misery

The Misery main pipe is being mined by open pit methods. Phase 1 of the Misery open pit was operated from 2002 to 2008 with 3.7 Mt of kimberlite being mined and processed, following which mining was suspended and the operation mothballed. Phase 2 production commenced in 2016 from the Main Misery pipe and will continue through to the end of 2018. The Misery open pit mining operation is described in detail in Section 16.4.5.

The Mineral Reserve was estimated based on the Misery Main resource block model that was last updated in July 2016.

All of the Misery Main kimberlite pipe is assumed to be removed for processing as there is no identified internal waste or low-grade kimberlite. As kimberlite mining takes place, the kimberlite is being transported to a surface run-of-mine (ROM) stockpile area adjacent to the existing waste dump, where waste rock is separated, if required, by mechanical means before transport to the processing plant.

Misery open cut design assumed dilution of 4% waste. The dilution percentage was calculated by applying a one meter skin of barren waste along the pipe contact. It was assumed that this waste material would not be separated during initial mining but on surface by mechanical means. The amount of dilution as a percentage of each mining bench is dependent on the kimberlite to waste ratio. After accounting for dilution, a mining recovery of 98% was based on previous operating experience where there is no internal dilution, and a clear distinction between kimberlite and the host rock.

15.3.3 Pigeon

The Pigeon open pit is located 6 km north from the Ekati process plant and main operational hub. Pigeon is being mined as a phased pit with ore production having started from this pipe in early 2016 and extending through to 2019. Kimberlite is being hauled directly from the pit benches 6 km to the ROM stockpile area adjacent to the processing plant. The Pigeon open pit mining operation is described in Section 16.4.6.

The Mineral Reserve was estimated based on the Pigeon July 2016 reserve block model and an updated open pit design.

It is assumed that all of the Pigeon kimberlite will be removed for processing as there is no identified internal waste or low-grade kimberlite. Waste rock is being separated from kimberlite, to the extent possible, by mechanical means at the pit bench and hauled to the final waste rock storage area.

Pigeon open cut design assumed an average dilution of 6% waste, which was considered a reasonable estimate, based on previous experience at Fox and Misery open pits. The uppermost benches of kimberlite had higher than expected dilution from the overlying till.

After accounting for dilution, a mining recovery of 98% diluted material was based on previous operating experience where there is little internal dilution, and a clear distinction between kimberlite and the host rock.

15.3.4 Sable

The Mineral Reserve was estimated based on the Sable resource block model that was updated in 2015 and the open pit design developed for the Sable pre-feasibility study completed in early 2016. Pre-stripping is assumed to commence in February

2018, kimberlite mining will occur from late 2018, and be completed in 2022. A single-phase pit is envisaged.

The Sable open pit design assumed dilution of 2% waste. After accounting for dilution, a mining recovery assumption of 98% diluted material was based on previous operating experience at Ekati, where there is no internal dilution, and a clear distinction between kimberlite and the host rock.

15.3.5 Lynx

The Mineral Reserve was estimated based on the Lynx July 2016 reserve block model and the two stage pit design of May 2016.

Costs, mining recovery, and dilution estimates were based on the nearby operating Misery pit and on the processing facility at the Ekati main camp, which would handle the ore from the Lynx pit. Additional ore transport costs were estimated to allow for the stockpiling and transportation to Ekati by long-haul truck.

15.3.6 Jay

The Jay pipe is located approximately 1.2 km from the shoreline of Lac du Sauvage. The area and shoreline close to the Jay pipe is undeveloped except for the Misery Pit and related infrastructure, which is approximately 7 km to the southwest, and the main Ekati mine infrastructure, which is 29 km to the northwest.

The Mineral Reserve was estimated based on the Jay resource block model that was updated in 2015 and the open pit design developed for the Jay feasibility study completed in 2016.

The feasibility study mining schedule assumptions were as follows, using calendar years, where the end of production in 2032 would equate to FY33. Production is planned to begin in 2022 and conclude in 2032. Based on the size of the ultimate pit, the depth of the overburden and previous studies, a phased mining approach is proposed. To manage the peaks in ore availability associated with the completion of each phase, a stockpiling strategy is planned, in which processing of the bottom of each phase occurs and processing continues after the completion of mining.

The Jay open cut design assumed dilution of 2% waste. After accounting for dilution, a mining recovery assumption of 98% diluted material was based on previous operating experience.

15.4 Mineral Reserve Estimation – Underground

15.4.1 Control of Waste Dilution

During mining, some waste rock will be removed through sorting at the draw-point, as well as at the grizzly and sizer reject chute.

The distinction between ore and waste is apparent in the draw points; however, primary sorting is limited to an assessment of the amount of waste rock visible. This assessment allows determination of the transport method to the process plant. Ore-dominant draw points (≥75% kimberlite) are loaded to the crusher and conveyor system for delivery to the process plant. Waste rock dominant draw points (≤75% to ≥25% kimberlite) are designated as rocky ore and are stored separately in remucks then later hauled to the surface using the truck system where it is stockpiled for sorting by the surface ore sorters (excavators) in good visibility conditions. Material with >75% granite is designated as waste and is hauled to the surface waste dumps.

These waste removal practices have been applied to the estimation of waste dilution and mining recovery.

15.4.2 Koala

The Koala Underground has been in operation for the last eight years. Since production started at Koala underground at the end of 2007 to the end of July 2016, over 7.7 Mt of kimberlite have been mined and processed from this part of the pipe. The Koala underground mine is fully operational and is scheduled to be in production through to 2019. The Koala underground mining operation is described in Section 16.5.3.

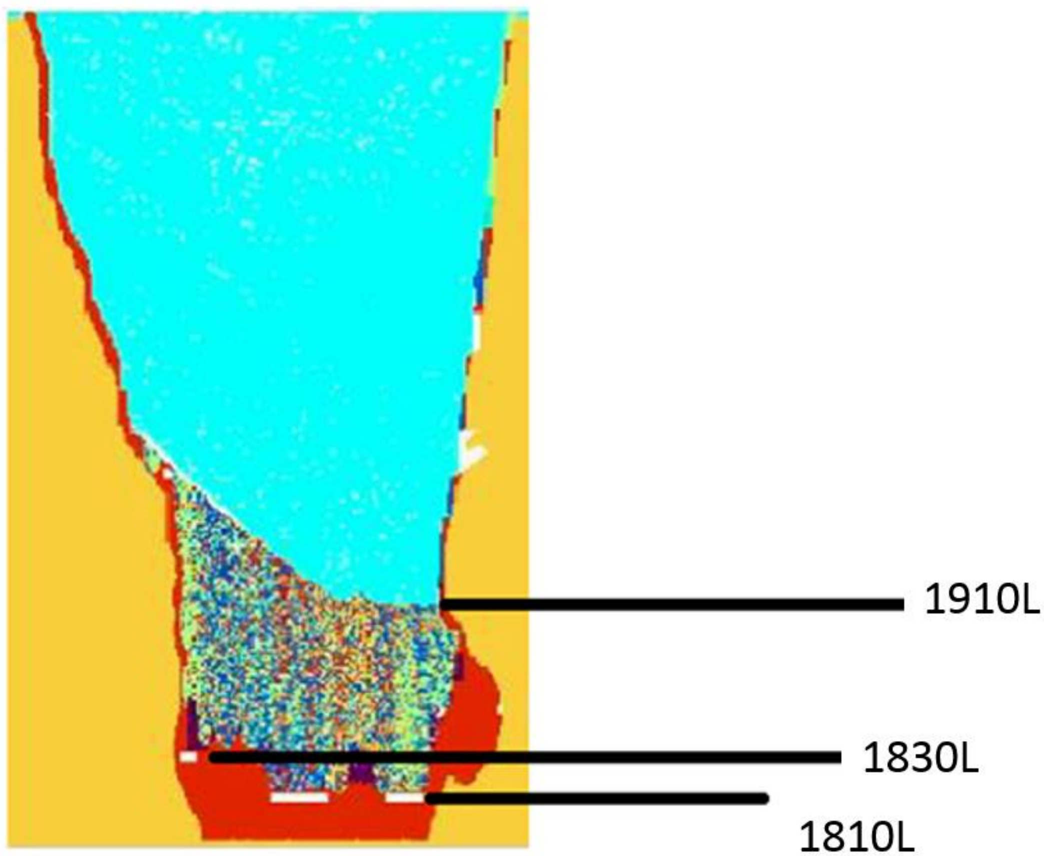
The Mineral Reserve was estimated in two steps:

- Firstly, the Mineral Resources contained within the planned mining shapes in the mine design were estimated. The estimate was supplemented with external dilution from granite wall rock. This diluted material was the estimated Mineral Reserve prior to mining;
- Secondly, remaining Mineral Reserves, after mining started and production was ongoing, were estimated on a regular basis. Power Geotechnical Cellular Automata (PGCA) software was used to estimate the Koala Mineral Reserve by depleting processed tonnes from the geological block model then modelling productive draw down of the cave until the end of mine life in 2019.

PGCA models cave flow using cellular automata, a regular grid of cells where each cell is assigned a probability to move. The model simulates extraction by allowing the cells to move on the basis of their relative location and rules governing cave flow dynamics as established through marker trials at a number of SLC mines throughout the world.

Figure 15-1 shows the PGCA model depleted to approximately 1910L. PGCA software is accessible for use by site-based engineers and is used to estimate both short-term scheduling outcomes and longer-term Mineral Reserve outcomes.

Figure 15-1: Section through the PGCA Koala Model Showing Mixing and Wall Dilution



Note: Figure prepared by Dominion, 2016. Levels are spaced at 20 m intervals. Cyan = air; yellow = host rock/granite; red = kimberlite and multi-coloured is caved material (kimberlite + dilution)

Future production from the Koala cave is modelled by simulating the production schedule based on the estimated Mineral Reserves. In turn, the extraction schedule is developed from first principles using actual productivity observed in the current Koala operation.

The Koala mine experiences external waste dilution from the kimberlite/granite contact and internal waste dilution from entrained xenoliths. Estimates from diamond drill core intersection fracture frequency analysis resulted in an allowance of a 2 m thick zone around the full circumference and full height of the deposit in the pipe for external waste dilution. Internal waste dilution includes large xenoliths on the contact of the lower-grade kimberlite located between the open pit and the top of the SLC. Because of the bulk nature of the mining method all kimberlite in the pipe has the potential to be produced from a draw point. For Koala the kimberlite dilution is estimated to average 4%. Both external and internal waste dilution are incorporated in the PGCA cave simulation.

As the cave is drawn down, higher-grade material in the lower area of the mine will be diluted by lower-grade material lying between the open pit and the SLC operation. Draw control strategies are used to minimise mixing between the higher grade material close to draw points and the lower grade material from above. Mixing of different material types is simulated in the PGCA model.

It is not practical to employ a shut-off grade strategy for the Koala cave. Grade cannot be determined by visual inspection alone and sampling is not viable due to the sample support needed in contrast with the mining capacity. Draw control of cave operations is based on level by level draw management plans which are embedded in the production schedule. In the Mineral Reserve mine plan the Koala underground has been scheduled to produce at a maximum rate of 1.0 Mtpa in FY18 with reducing production rates over the remaining mine life to FY20 (refer to Table 16-9 in Section 16).

Previous work assumed that a minimum 60 m residual blanket of highly-diluted material would be required above the last production level. This blanket would protect the production levels from risk events associated with pit wall failures and subsequent mud inrush or air blast events. The current Mineral Reserve maintains this 60 m residual blanket. However, the thickness of the residual blanket will require further review throughout the remaining mine life, based on precedent industry practice and experience.

Overall dilution of 4% has been assumed. After accounting for dilution, the mining recovery of kimberlite was estimated during the Koala underground feasibility study at 87%. This estimate was calculated by estimating the amount of kimberlite material projected to be lost during:

- Waste rock removal at production draw points;
- Removal of waste rock at sizer reject chute;

- Separation of kimberlite from waste rock during surface sorting;
- Kimberlite that is not extracted from the cave is left in the residual 60 m blanket.

For the Koala underground Mineral Reserves for end July 2016, the previously reported Mineral Reserves (end January 2016) were depleted by Koala production during the first half of FY17 (processed ore and stockpile).

15.5 Mineral Reserve Statement

Mineral Reserve estimates are based on material classed as Indicated Mineral Resources with dilution applied. Consideration of the environmental, permitting, legal, title, taxation, socio-economic, marketing and political factors support the estimation of Mineral Reserves.

The Mineral Reserves estimate was prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy.

Mineral Reserves are summarized in Table 15-4 by kimberlite pipe and have an effective date of 31 July, 2016. Mineral Reserves are reported on a 100% basis. No Proven Mineral Reserves have been estimated.

Table 15-4: Mineral Reserves Statement

Classification	Joint Venture Agreement Area	Kimberlite Pipe	Tonnes (millions)	Grade (cpt)	Carats (millions)
Probable	Core Zone	Koala (underground)	2.3	0.6	1.3
		Misery (open pit)	2.8	5.2	14.7
		Pigeon (open pit)	6.6	0.5	3.2
		Sable (open pit)	12.0	0.8	10.1
		Stockpiles (surface)	1.0	0.8	0.8
Subtotal Probable (Core Zone only)			*24.7*	*1.2*	*30.2*
Probable	Buffer Zone	Jay (open pit)	44.7	1.8	78.6
		Lynx (open pit)	1.0	0.8	0.8
Subtotal Probable (Buffer Zone only)			*45.7*	*1.7*	*79.4*
Total Probable			***70.4***	***1.6***	***109.6***

Notes to Accompany Mineral Reserves Table.

1. Mineral Reserves have an effective date of 31 July 2016. The Mineral Reserves were prepared under the supervision of Mr. Peter Ravenscroft, FAusIMM, of Burgundy Mining Advisors Ltd., an independent mining consultancy. Mr. Ravenscroft is a Qualified Person within the meaning of National Instrument 43-101.
2. Mineral Reserves are reported on a 100% basis.
3. Dominion is operator and as at 31 July, 2016, has an 88.9% participating interest in the Core Zone Joint Venture area where Mineral Reserves are estimated for the Koala, Misery, Sable, and Pigeon kimberlites and stockpiled materials. Dominion is operator and as at 31 July, 2016, has a 65.3% participating interest in the Buffer Zone Joint Venture area where Mineral Reserves are estimated for the Jay and Lynx kimberlites.
4. The reference point for the definition of Mineral Reserves is at the point of delivery to the process plant.
5. Mineral Reserves are reported at +1.0 mm (based upon diamonds that would be recovered by the Ekati bulk sample plant using 1.0 mm slot de-grit screens and equivalent to the current Ekati process plant recovery) and inclusive of incremental small diamonds recovered by the fines dense media separation (Fines DMS) circuit which is scheduled for commissioning in late FY17.
6. Mineral Reserves that will be, or are mined using open pit methods include Misery, Pigeon, Sable, Lynx and Jay. Mineral Reserves are estimated using the following assumptions: Misery open pit design assumed dilution of 4% waste and mining recovery of 98% diluted material; Pigeon open pit design assumed dilution of 6% waste and mining recovery of 98% diluted material, Sable open design assumed dilution of 2% waste and mining recovery of 98% diluted material; Lynx open pit design assumed dilution of <2% waste and mining recovery of 98% diluted material; Jay open pit design assumed dilution of 2% waste and mining recovery of 98% diluted material.
7. Koala Mineral Reserves are mined using underground mining methods. The Koala Mineral Reserves estimate assumed an overall dilution of 4% and mining recovery of 87% of the diluted material.
8. Stockpiles are minor run-of-mine stockpiles (sourced from underground and open pit) that are maintained at or near the process plant and are available to maintain blending of kimberlite sources to the plant.
9. Tonnes are reported as metric tonnes, diamond grades as carats per tonne, and contained diamond carats as millions of contained carats.
10. Tables may not sum as totals have been rounded in accordance with reporting guidelines.

15.6 Factors That May Affect the Mineral Reserve Estimates

Factors that may affect the Mineral Reserve estimates include:

- Diamond Price Book and valuation assumptions;
- Changes to the assumptions used to estimate diamond carat content;
- Changes to design parameter assumptions that pertain to the block cave designs, and cave flow modelling including the impact of potential mud rush events;
- Appropriate dilution control being able to be maintained;
- Changes to design parameter assumptions that pertain to open pit design, including the estimation of granite xenolith distribution and geotechnical constraints;
- Mining and metallurgical recovery assumptions;
- Changes to capital and operating cost estimates, in particular to fuel cost assumptions;
- Changes to royalty payment assumptions;
- Variations to the permitting, operating or social license regime assumptions, in particular if permitting parameters are modified by regulatory authorities during permit renewals

15.7 Comments on Mineral Reserve Estimates

The responsible QPs are of the opinion that the Mineral Reserves for the Ekati Diamond Mine appropriately consider modifying factors, have been estimated using industry best practices, and conform to the CIM (2014) definitions.

16.0 MINING METHODS

16.1 Introduction

Operators at Ekati now have 18 years of continuous open pit mining experience in seven separate pipes since mining commenced in 1998. This experience provides reliable technical and cost information on which to determine the feasibility and design of future open pits. Since underground mining beneath the Panda open pit started in 2004, the Ekati operators now have 13 years of continuous underground mining experience.

The Koala underground mine is in production. Both Pigeon and Misery open pits have commenced production. The Lynx open pit started pre-stripping in 2015 and production is scheduled for early 2017. The Sable open pit is scheduled to start pre-stripping in 2018 and production in 2019. The Jay open pit is scheduled to start pre-stripping in 2021 and production in 2022.

16.2 Geotechnical

The rock mass rating system used for logging and mapping at Ekati is based on Laubscher RMR system where the following ratings equate to different rock strengths:

- 0–20: Very poor;
- 21–40: Poor;
- 41–60: Fair;
- 61–80: Good;
- 81–100: Excellent.

The major kimberlite lithologies in the production pipes have a wide range of measured strengths that range between very poor to upper fair (Table 16-1). The granitic rocks and schist rocks at Ekati range between fair to excellent quality and the majority of the granite is good quality.

Table 16-1: Ekati RMR Ratings by Kimberlite Pipe

Pipe	Lithology	RMR Range	RMR Average
Misery	Schist	40–80	53
	Granite	40–80	60
	Kimberlite	—	49
	Diabase	—	57
Koala	Granite	—	92*
	Phase 6/7 Kimberlite	—	88*
	RVK Kimberlite	—	73*

Note: RMR_{76} rock classification system

Separate geotechnical assessments have been conducted for each pipe that is being mined, and will be conducted on future deposits. These investigations are designed to quantify geotechnical domains in detail.

16.2.1 Gas

During the surface and underground mining and diamond drilling carried out to date, limited noxious gas concentrations have been encountered, although some organic material is present in the kimberlite.

16.3 Hydrogeology

The presence of abundant bedrock at surface, a thin, largely low permeability soil cover, and permafrost encourages surface runoff. Mean annual runoff coefficients of 1.0 (pit), 0.5 (tundra and plant site) and 0.05 to 0.25 (waste rock stock piles) have been estimated from a 2009 review of all pit pumping and stream hydrology data that was conducted for Ekati by Rescan Environmental Services.

As host rocks have been faulted and overprinted there is potential for hydraulic conductivity or storage. Kimberlite has very low hydraulic conductivity (measured at Koala, Panda, Misery and Fox pits) and the intensity of kimberlite fracturing has little effect; however, kimberlite has a high storage capacity due to its porosity.

Using the knowledge gained from packer testing of the drill holes, Westbay data, and in-pit observations, a general hydrogeological model for Ekati assumes four hydrogeological units that control the groundwater flow:

- Permafrost is considered impermeable with a specific yield of zero;
- Kimberlite with a very low bulk permeability (K), but a reasonable specific yield;

- Weakly fractured granite away from the influence of a pipe with a low K and low specific yield;
- Fractured granite surrounding the kimberlite pipe with a moderate K and low yield.

The chemical properties of groundwater collected and pumped from the underground are monitored. Prior to December 2009 all mine discharge water was pumped into the Long Lake Containment Facility. Post April 2010, underground mine discharge water was pumped into the Beartooth pit, whereas post June 2010, the majority of underground discharge is pumped into the Panda glory hole. Distinct seasonal variations in both the quality and quantity of the water being discharged from the underground operations are evident.

Surface water chemistry has a different signature than that of groundwater samples. Studies conducted suggest that there is no indication that groundwater is currently recharged from surface water bodies at an observable rate. This is as expected because the permafrost layer is several hundred metres thick and the only hydraulic connectivity to surface is through low permeability talik zones underlying larger lakes.

Underground mine water chemistry is fully dependent on the proportions of deep high total dissolved solids (TDS) groundwater mixed with surface-derived water that enters the underground mine through the open bottoms of the Panda and Koala pits. Groundwater sampled from initial hydraulic packer testing is consistent with typical deep Canadian Shield groundwater. This brackish water, dominantly Ca-Na-Cl type, has increasing TDS with depth.

The proposed Jay operation will be the first Ekati open pit to be developed within a water retention dike in a large lake. Further detail on the hydrogeological characteristics of the Jay area is given in Section 16.4.8.

16.4 Open Pit Operations

16.4.1 Design Considerations

The kimberlite pipes at Ekati are approximately circular in plan view and are generally located within granite, a competent host rock. The ore–waste boundary is abrupt and is readily distinguished by rock type. Ultimate vertical mining depths are 300 m at Misery, 190 m at Pigeon, 300 m at Sable, 140 m at Lynx, and 360 m at Jay.

The open pits are currently mined using conventional truck-shovel operations and are developed in benches that are typically 10 m high. The Jay pit, due to the presence of overburden and significant resedimented kimberlite, will have double bench (30 m) configuration in granite and metasediment, single bench (15 m) configuration in kimberlite, and single bench (10 m) configuration in the overburden. Sable is planned on triple benches (3 x 10 m).

Design pit slopes vary significantly between waste and kimberlite and are established based on detailed geotechnical and hydrogeological studies and operational requirements for each pipe.

Phased mining has been used at the Misery and Pigeon pipes, and is planned for the Lynx and Jay pipes. Sable will be mined in a single pit phase.

A single circular access ramp around the perimeter of the pit is developed progressively as the benches are mined. Waste rock is hauled to a designated waste rock storage area and dumped to an engineered design. Kimberlite is hauled directly from the Pigeon pit benches to the process plant. For all other open pit operations, additional kimberlite storage and handling is required.

Kimberlite ore is selectively mined on the basis of visual delimitation. Ongoing high wall stability monitoring is routine and slope re-design and/or risk mitigation works are performed as required.

Where possible, open pit mining equipment is standardised with what is already in use on site. The selection of the similar parameter equipment for new pits minimises equipment operator and maintenance training needs and reduces warehouse spares inventory. Furthermore, the mobile mining and servicing fleet will be widely shared with the entire Ekati site.

The main truck loading and haulage equipment currently in use are diesel hydraulic shovel/excavators with a bucket capacity of 12 m^3 and 90 t capacity off-road haul trucks. The Jay mine plan assumes 225 t capacity off-road haul trucks for ore and waste haulage. The main loading units selected for Jay were 17 m^3 loaders and 34 m^3 shovels.

Production blast holes are 270 mm or 251 mm diameter drilled on a 5.25 m by 6.0 m equilateral pattern with 10 m bench heights. The planned Jay operation will have a production blasting pattern that will accommodate the 15 m bench heights. Wall control blasting practices including pre-shear firings on the perimeter of the pit excavation enhance final high wall stability. Wall control procedures on the final pit walls consists of drilling 165 mm presplit blast holes on a 2.0 m spacing on the pit perimeter, followed by a row of 270 mm wall control blast holes on a 3.0 m burden and 4.0 m spacing, then a second row at a 5.0 m by 5.0 m spacing before switching to the standard production pattern.

Double or triple benching is used for the final pit walls when in granite.

16.4.2 Explosives

Blast hole loading is provided by a ‘down-the-hole’ service from an on-site explosives supply contractor and supervised by the Ekati blasting team. Since the blast holes are frequently wet, a chemically-gassed emulsion explosive doped with 30% AN prill is used both in waste and kimberlite blasting.

16.4.3 Grade Control

There are no empirical grade control programs. However, grade verification of block models is carried out periodically by collecting and processing run-of-mine open pit development samples (typically 50 t each). Generally all kimberlitic material within the resource models is considered to be plant feed, and is either processed directly or stockpiled for possible future processing.

16.4.4 Open Pit Geotechnical

The following geotechnical monitoring programs are performed in the active open pits: observational logs; instrumentation (prism, time domain reflectometry (TDR), thermistors and multi-point borehole extensometer (MPBX)); photogrammetry; mapping; and regular inspections by geotechnical engineers. Bench reliability plots are developed for each active pit and allow for the identification of catch bench non-compliance.

Photogrammetry is the main operational tool used for in-pit mapping. This tool allows for the rapid and safe assessment of structures on the pit high walls.

Two GroundProbe slope stability monitoring radars are installed at the top of Misery Pit and measure wall movement through a series of continuous scans over the pit walls. Monitoring alarms have been established to alert mine operations of increased movement in order to ensure operations personnel are removed from any impending ground fall areas.

16.4.5 Misery Open Pit

16.4.5.1. Status and Design

Phase 1 of the Misery open pit was operated from 2002 to 2008 with 3.7 Mt of kimberlite being mined and processed, following which mining was suspended. An internal feasibility study was subsequently completed on mining Phase 2 of the Misery pit and the decision was made to proceed with recommencement of mining. Production of kimberlite commenced in May 2016 from Misery Main.

A plan view and an isometric view of the Misery pit are shown in Section 7 as Figure 7-7 and Figure 7-8 respectively.

At the Report effective date, the mining operation was fully underway with all required infrastructure complete and mobile equipment. Waste stripping was started in September 2011, and to the end of July 2016 a total of 60.2 Mt of the waste rock and kimberlite had been excavated.

The Misery pipe is located 29 km from the process plant and main operational hub. To improve efficiencies and logistics, a satellite infrastructure facility including equipment workshop and camp was constructed with completion at the end of August 2012. The locations of the Misery pipe, main camp, and access road connecting them to the Ekati plant was included in Figure 2-1 in Section 2 of the Report.

16.4.5.2. Geotechnical

Rock mass quality was assessed using the available data from relevant boreholes, RMR, and observations and data from the open pit. The granite is generally good to very good quality, decreasing slightly (becoming fair to good) near surface due to near-surface stress relief effects. Information on the diabase is limited to core photos from two boreholes and observations of the MacKenzie-trend diabase dykes elsewhere. This information indicates that the rock is of good quality with a fracture frequency of approximately two to three fractures per metre. The majority of the metasediment can be classed from fair to good (RMRL = 40 to 80). The slope analysis for the Misery pit was carried out by Zostrich Geotechnical. The model is predictive on a number of failure modes for various slope heights. These include:

- Bench scale wedge and plane shear (fabric controlled);
- Inter-ramp scale wedge and plane shear (fabric or fault controlled);
- Overall slope failure (fault controlled).

The maintained catch bench width was planned to be 11 m for the 30 m high bench. With the addition of the Southwest Extension domain, a bench face angle of 39° was applied. A 50° bench face angle for the remaining kimberlite was utilized in the mine design.

Design parameters for the Misery open pit are shown in Table 16-2.

Table 16-2: Misery Open Pit Design Parameters

Design Parameters	Design	Unit
Bench Height	10	metres
Ramp Width	26	metres
Ramp Grade	10	%
Geotechnical Parameters	**Design**	**Unit**
Overall slope angle in kimberlite main pipe and satellite pipes	50	degrees
Overall slope angle in kimberlite southwest extension	50	degrees
Overall slope angle in overburden	35	degrees
Minimum diameter pit bottom	50	metres
Minimum pushback width	50	metres

16.4.5.3. Hydrogeology and Dewatering

The depth of permafrost at Misery is estimated to extend to 0 masl (surface at 465 masl). Taliks, unfrozen portions of ground surrounded by permafrost, are thought to occur below the Lac de Gras, Mist Lake and the Misery pit (formerly the site of Misery Lake). These lakes with taliks below them may facilitate water movement along faults and fractures into the Misery pipe. A survey of structural zones in the area indicates that a lineament may exist that may connect Lac de Gras with the Misery pit and may provide seepage from the lake to the Misery pipe, although water ingress was not encountered during previous exploration drilling and mining activities.

Minimal groundwater inflows in the order of 2.5 L/s into the pit have been encountered due to the presence of permafrost. Because of the limited storage capacity of the bedrock and the absence of ice-free fractures, water recharge is unlikely to be significant.

A study of estimated inflows during a 1-in-10 and 1-in-100 “wet” year rainfall event indicated that the pumping capacity of the existing surface water management system is sufficient to handle high precipitation periods. As a result, the existing surface pumping and storage facilities are adequate for open pit operations.

The dewatering system of the open-pit mine consists of a skid-mounted diesel pumping system with a sump located at the pit bottom and moved as surface mining develops. High density plastic piping connects the pump/sump system to discharge mine water into the King Pond Settlement Facility.

16.4.5.4. Operations

Open pit mining has commenced with pre-stripping of the waste “donut” around the current Phase 1 Misery open pit from surface to 280 masl. The pit has now advanced to the 270 masl bench. Kimberlite production started at 280 masl and will progress through to 150 masl. The operation will have a life of six years from start of waste stripping to final kimberlite extraction.

There is clear distinction between the kimberlite material and the granite/metasediment host rock which will allow for effective ore waste determination. All of the Misery Main kimberlite pipe will be removed for processing as there is no identified internal waste.

Dilution is expected to be minimal on the lower benches, with mechanical sorting at the bench and clean up along the ore/waste contact during mining, supervised by production geologists.

For Misery, the fleet combination employed consists of hydraulic shovel/excavators with a bucket capacity of 12 m^3, 90 t capacity off-road haul trucks, rotary blast hole rig drilling at 270 mm diameter and a diesel ITH hammer drill rig capable of drilling a 152 mm or 203 mm diameter hole size up to 30 m in length. The standardized equipment fleet is provided in Section 16.6.

ROM waste rock is hauled to the Misery waste rock storage area.

As Main Pipe ore mining continues, the kimberlite is being transported to surface ROM stockpile areas located adjacent to the base of the existing waste dump. The kimberlite on the transfer pad is then be loaded into 210 t capacity long haulage road trains for transport to the process plant. Currently Ekati has a fleet of two of these trucks. It is planned to purchase additional haulage road trains to support the proposed Jay and Sable operations.

16.4.5.5. Satellite Pipes

Significant quantities of the Southwest Extension and South kimberlite pipes are known to be, in part, within the limits of the stripping operation for the Main pipe and some of this kimberlite has been mined in order to access the Main pipe. This kimberlite is not currently included in the mine plan that is based on the estimated Mineral Reserves, but is included in the Operating Case Mine Plan (refer to Section 16.8). A grade control strategy has been actioned to evaluate these pipes on an on-going basis as they are mined during stripping for the Main pipe. Satellite kimberlite pipe locations are located external to the Main pipe. This kimberlite material is being stockpiled and processed separately from the Main pipe kimberlite. Stockpile management and waste management procedures have been established to prevent cross contamination of the Main and satellite kimberlite phases. Satellite kimberlites evaluated to have no economic value are being treated as waste in accordance with the waste rock storage plan.

16.4.6 Pigeon Open Pit

16.4.6.1. Status and Design

The Pigeon open pit is located 6 km north of the Ekati process plant and main operational hub. A 200 m long connector haul road connects the Pigeon pit to the existing Sable all-weather haul road. The Pigeon open pit is being mined as a two-phase pit. Production from this pipe started in late 2015.

A plan and isometric view of the Pigeon pipe is shown in Section 7 as Figure 7-10 and Figure 7-11 respectively.

For design the optimum pit shell was determined using the Whittle Four X optimizer. It determines the maximum profit pit size for the ore body, based on the grades in the geological model, pit slopes, and the economic price/cost assumptions employed for the analysis.

Kimberlite is being hauled directly from the pit benches by 90 t capacity trucks to the ROM stockpile area adjacent to the processing plant. For waste stripping, a blanket of overburden till was removed followed by the waste rock and trucked using the same 90 t trucks to a permanent waste dump location.

Development of the Pigeon pit removed the Pigeon Pond and a portion of the Pigeon Stream. A 450 m long Pigeon Stream diversion channel has been constructed to realign the Pigeon Stream and provide a permanent fish habitat. In addition, a series of water diversion berms were constructed along the limits of the open pit perimeter in conjunction with a perimeter access road.

Mining operations were temporarily suspended at Pigeon after the process plant incident in late June (refer to Section 17.1). Mining is scheduled to resume at Pigeon in October 2016.

16.4.6.2. Geotechnical

The key geotechnical issue for Pigeon is the understanding of the wall-rock geology and structure. The host rock geology includes granite, granitic gneiss and metasediments and diabase dykes. A review of core logs and photographs undertaken by Mineral Services in 2006 resulted in the reclassification of the majority of the wall-rock domain from biotite granite to interbedded granitoids and metasediments.

The Stage I pit has been fully mined to the 400 Bench. During excavation, geotechnical wall mapping using photogrammetry methods was undertaken to provide detail data to enhance the pit design for Phase II (ultimate) pit. The data were collected by site geotechnical engineers, and provided to Zostrich Geotechnical. A final report for the Phase II design was received from Zostrich Geotechnical in April 2016. The report recommended 20 m benches taken in 10 m cuts, in addition to refinement of the overall slope angles, based on additional mapping, and performance of the Stage I walls.

Design parameters for the Stage II pit are presented in Table 16-3.

Table 16-3: Pigeon Stage II Design Angles
(inter-ramp based, expected case, 20 m bench height)

Face Dip Direction		Expected	Bench Parameters		
From (º)	To (º)	IRA (º)	Height (m)	Bench Width (m)	Design Face Angle (º)
0	90	37	20	9	49
90	100	42	20	9	57
100	120	49	20	9	67
120	210	58	20	9	80
210	220	55	20	9	76
220	260	51	20	9	70
260	270	46	20	9	63
270	360	37	20	9	49

Notes: From 120 to 210 inter-ramp is bench controlled; IRA = inter-ramp angle; BFA = Bench face angle (determined from IRA and 20 m bench height); Pit azimuth, can be converted to face dip direction by subtracting 180º

Additional mining parameters are:

- Maintain 30 m distance from the Pigeon Stream diversion channel;
- Maintain 50 m distance from the current haul road.

Hydrogeology and Dewatering

The Pigeon open pit development has encompassed Pigeon Pond and intersected the Pigeon stream. Most of the overland flow generated in the Pigeon stream catchment, an approximate 10 km^2 area, is being directed around mining activities by the Pigeon stream diversion channel. The remaining portion of the catchment reporting to the pit is approximately 55 ha in size. Surface diversion berms have been installed to manage overland flows in the pit catchment area. This option will divert 70 to 90% of the overland flows that would otherwise report to the pit. Surface hydrology was evaluated based on three design events: freshet, a 1:10 12-hour rainfall and a 1:100 24-hour rainfall.

The pit itself comprises a significant portion of the catchment area. Precipitation falling into the pit cannot be managed by surface diversion works; therefore, any direct precipitation into the pit is managed with in-pit sumps and pumping. A high-flow system is required to manage the large storm events. A low-flow system is also required to manage lower daily volumes. In-pit sumps have been sized to accommodate summer storm events. Freshet volumes are significantly large and sump containment is not practical; however, some of the freshet volume may be accommodated by the sumps depending on the duration and severity of a given freshet event.

Estimated peak flows into the pit during summer storm events are 0.4 m^3/s for both summer storm events. Approximately 1,900 m of piping with an elevation gain of 180 m would be required to pump water from the base of the pit to the crest. Assuming a pumping rate of 0.25 m^3/s, sumps of 3,700 m^3 and 1,800 m^3 would be required for the 1:10 and 1:100 year events respectively.

Pre-stripping dewatering was directed to the Long Lake Containment Facility and carried out during summer months. Mine water that accumulates in the pit during production (estimated at approximately 74 km^3 per annum) will be pumped, with utilization of perimeter sumps, to the Long Lake Containment Facility. The addition of Pigeon mine water to the Long Lake Containment Facility is not expected to influence the operations ability to meet existing effluent quality requirements.

16.4.6.3. Operations

The current Ekati system of open pit operation management has been extended to include Pigeon operations and all the equipment is maintained at the Ekati truckshop. The operations are supported with mobile support and supply trucks (crew buses, explosive, fuel, water, sewage, etc.) from the main Ekati operational hub. Power is supplied by a dedicated generator.

Minimal surface infrastructure is required to operate the Pigeon pit. A small lunch room, field office complex and washroom facilities are located near the pit. This is also used as an emergency storm shelter with first aid room and emergency supplies. Personnel are bussed in from the operations hub at shift start and end. This is similar to how the Fox pit was operated.

Kimberlite is hauled directly from the pit benches 6 km to the ROM stockpile area adjacent to the processing plant. Waste rock is hauled to the final waste rock storage area. Pigeon's equipment fleet consists of hydraulic shovel / excavators with a bucket capacity of 12 m^3, 90 t capacity off-road haul trucks, rotary blast hole rig drilling at 270 mm diameter and a diesel in-the-hole (ITH) hammer drill rig capable of drilling a 152 mm or 203 mm diameter hole size up to 30 m in length. The standardized equipment fleet is discussed in Section 16.6.

Mining operations were temporarily suspended at Pigeon after the process plant incident in late June 2016 (refer to Section 17.1). Mining will resume in late September 2016 pending recommissioning of the process plant.

16.4.7 Sable Open Pit

16.4.7.1. Status and Design

The planned Sable open pit is situated about 17 km north–northeast of the Ekati main camp.

An approximately 22 km long all-weather haul road is being constructed from the Sable site to the Ekati process plant, and requires six water crossings. A small road network will be built at the Sable site. These roads will be built in the same manner as other Ekati roads, pit-run waste capped with crushed rock. A lay-down area and fuel tank area will also be constructed with pit-run waste capped with crushed rock. Additional access roads will be required for reclamation purposes. The construction of these roads will be planned such that clean waste material will be available.

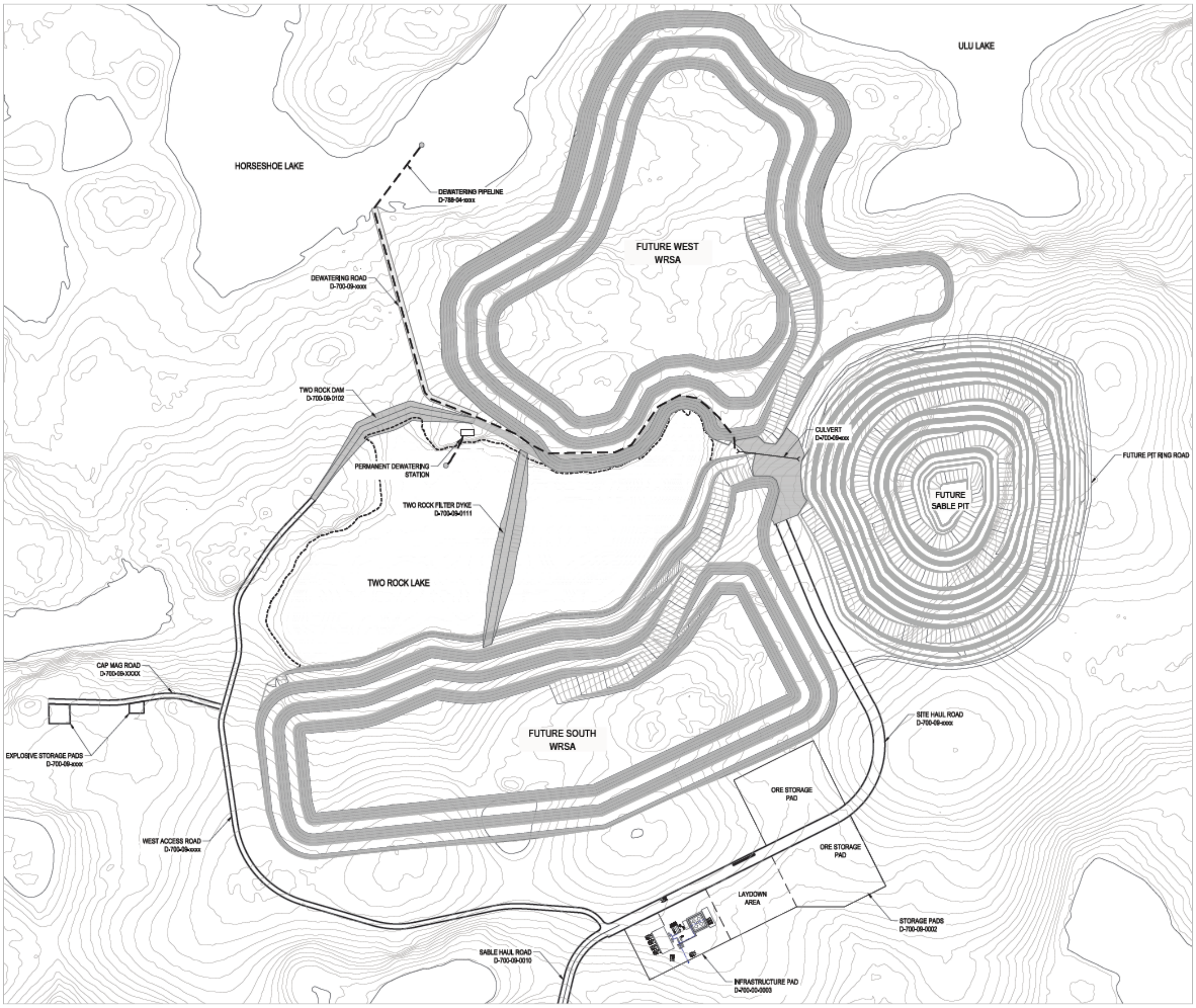
In order to dewater Sable Lake, Two Rock Lake will be used as a sedimentation pond to manage discharge water quality. Two water control structures will be required to achieve this: Two Rock Dam, a zero-discharge, frozen core dam located at the outlet of Two Rock Lake and Two Rock Filter Dike, a semi-pervious granular filter structure which will divide the lake into two cells.

Construction is expected to take approximately two years (2016 to 2017). The construction period will be followed by an approximate six-year operational period (2018 to 2023), during which kimberlite from the Sable pit will be mined, with full production achieved in 2019. The Sable pit will be mined using conventional open-pit truck-and-shovel operations.

Plan and isometric views of the Sable pipe are included in Section 7 as Figure 7-12 and Figure 7-13 respectively.

A conceptual layout plan for the operation is included in Figure 16-1. The Sable project has been designed to maximize the use of existing infrastructure to reduce the environmental footprint.

Figure 16-1: Conceptual Layout Plan, Sable



Note: Figure prepared by Dominion, 2016. Figure north is to the top of the figure. As an indicative scale, the east–west distance across the planned open pit is approximately 600 m.

16.4.7.2. Geotechnical

A preliminary pit slope evaluation was completed in October 2002 by Ursa Engineering (now Zostrich Geotechnical) and provided design parameters used in this study. This report also provided an assessment of geotechnical setting, potential failure modes, and recommendations for future work. In October 2014, the existing data was re-examined with the most current knowledge and standards.

Based upon more recent work conducted for the Pigeon pit slope, it appears the Sable area may be more closely related genetically to the Pigeon area than Panda. Sable appears to fall along a trend line with Pigeon similar to that along which Fox and Koala pipes are located, with the exception that the trend is offset to the northwest.

At the current stage, and without the recommended additional investigations proposed for feasibility-level investigations, there are no obvious structurally controlled stability issues in the proposed pit. There is, however, a concern with the diabase dyke which parallels and undercuts the ramp. There is potential for ramp loss in the northeast portion of the pit.

Design parameters for the Sable open pit operation are as indicated in Table 16-4.

Table 16-4: Sable Design Parameters

Design Parameters	Design	Unit
Bench Height	3 x 10	metres
Ramp Width	34	metres
Ramp Grade	10	%
Geotechnical Parameters	**Bench Face Angle (degrees)**	**Inter-ramp Angle (degrees)**
Sector 1	69.0	53.1
Sector 2	80.0	61.5
Sector 3	69.0	53.1
Sector 4	81.0	62.3
Sector 5	70.0	53.8
Kimberlite	60.0	36.0

16.4.7.3. Hydrogeology and Dewatering

The dewatering arrangements and management strategy for the Sable pit are discussed in Section 18.7.3.

16.4.7.4. Operations

For design purposes, the optimum pit shell was determined using Whittle. Overburden material is present from the top bench (495 masl) to the lake bottom at approximately 465 masl. Kimberlite begins to appear at the 480 bench and averages 700,000 dmt per bench to the pit bottom. It is expected that Sable will be a relatively straightforward pit to mine, with the planned mining strategies being similar to those employed at Panda and Koala. The estimated strip ratio is 1:8.6 (ore to waste). Mining at Sable would commence in 2018 and conclude in 2022. The mining schedule for Sable was constrained by both equipment (loading being the limiting factor) and ore release requirements.

Operation of the mine will include the following activities:

- The Sable open pit will be developed using the conventional drill and blast techniques. Overburden, waste rock, and kimberlite will be moved by truck-and-shovel operations;
- Mining trucks will haul waste rock and overburden from the pit to the Sable waste rock storage areas (WRSAs);
- Mining trucks will haul kimberlite from the pit to ore transfer pads, which will be located outside the Sable pit along the Sable haul road;
- A long-haulage road train (210 t) will haul kimberlite from the ore transfer pads to the processing plant or to a stockpile near the processing plant. The haul will be approximately 28 km along the Sable haul road. The use of kimberlite stockpiles will provide operational efficiencies and allows flexibility to maintain a consistent feed rate at the processing plant, while accommodating possible brief segmented road closures, if necessary, for poor weather or caribou presence.;
- The kimberlite will be processed in the existing processing plant to recover diamonds;
- Water for the processing plant is taken from the existing Long Lake Containment Facility;
- The fine processed kimberlite (FPK) will be deposited in the mined-out Panda and Koala open pits via pipelines from the processing plant to the pits. This method has been successfully demonstrated at the Beartooth pit;
- Coarse processed kimberlite will continue to be stored in the existing WRSAs;
- Ongoing operational water management will use the Two Rock Sedimentation Pond.

The Sable pit will require dedicated equipment, and will share some equipment resources with the planned Jay operation. Fleet selection was based on trade-off studies.

16.4.8 Lynx Open Pit

16.4.8.1. Status and Design

The Lynx open pit is located 3 km southwest from the existing Misery pit (refer to Figure 2-2). A 1 km long connector haul road was constructed to connect the Lynx pit to the existing winter road. Production from this pipe is scheduled in the Mineral Reserves Base Case Mine Plan to start in 2017.

Plan and isometric views of the Lynx pipe are included in Section 7 as Figure 7-16 and Figure 7-17 respectively.

Kimberlite will be hauled by 225 t capacity trucks directly from the pit benches to a new stockpile area adjacent to the Misery haul road. For waste stripping, a blanket of overburden till is being removed followed by the waste rock, and trucked using the same 225 t trucks to a permanent waste dump location.

Development of the Lynx pit has required dewatering of the Lynx Lake.

The equipment fleet was modelled in the XERAS maintenance model in use at Ekati, which is linked to the Deswik mining schedule and XERAS financial costing model. The haulage fleet was optimized in TALPAC and Deswik. Fleet requirements as developed within the XERAS maintenance model were optimized for the entire Ekati Diamond Mine production schedule, which provides significant equipment capital savings.

16.4.8.2. Geotechnical

Limited geotechnical logging of core from core holes drilled at Lynx was completed to determine the RMR. Data form drill core, aerial photographs, and drill core photographs was used in combination to determine overall pit wall stability. Zostrich Geotechnical provided a detailed report to Dominion in 2015. Outlining design parameters for lynx pit based on conservative angles due to the small data sets available. Due to the close proximity of the Lynx pit to the Misery pit, it is reasonable to assume the country rock to be similar between the two sites.

The Lynx pit walls will be in granite. The host rock lithology as it is currently understood consists of two-mica granite (the same host rock as at the Misery pit). If the rock masses at Lynx exhibit similar high strengths and good quality to Misery, failure through the rock masses would be unlikely to occur and the main consideration for rock slope failure mechanisms would be through structural controlled mechanisms at either a small scale or at a larger scale.

Two major geological structures have been interpreted that transect the Lynx pit, a diabase dyke, and a kimberlite dyke/fault. The diabase dyke is interpreted as 40 m thick, near-vertical, strikes north–south, and is located on the east side of the pit. The kimberlite dyke/fault is interpreted as 5–6 m thick, is also near-vertical, strikes north–south and is located on the west side of the pit.

Design parameters for the Lynx open pit operation are as indicated in Table 16-5. During operations ongoing programs of structural mapping, controlled perimeter blasting and ongoing high wall condition scaling will be required.

Table 16-5: Lynx Design Parameters
(estimated inter-ramp and associated bench face angles; conservative)

Pit Azimuth		Bench		Inter-ramp	
From (º)	To (º)	Face Angle (º)	Width (m)	Bench Height (m)	Angle (º)
0	45	57	11	30	44
45	135	75	11	30	57
135	195	68	11	30	52
195	275	57	11	30	44
275	315	68	11	30	52
315	360	63	11	30	48

Notes: IRA = inter-ramp angle; BFA = Bench face angle (determined from IRA and 30 m bench height); Pit azimuth, can be converted to face dip direction by subtracting 180º.

16.4.8.3. Hydrogeology and Dewatering

Shallow groundwater flow occurs in a seasonally active zone that is limited to the overburden and weathered bedrock. Groundwater flow rates and directions in this shallow system are controlled by topography and presence of coarser-grained overburden sediments. Potential shallow groundwater seepage through the overburden in the saddle zone located in the northern area of the current Lynx Lake may occur into the Lynx open pit. The amount of water present is anticipated to be small due to the small local catchment area. However, if this seepage is found to be of a magnitude that represents a risk to pit wall stability or mine operations, a runoff water deflection structure may be constructed to direct this water around the open pit during mine operations.

Based on experience at the other open pits at the Ekati Mine and on drill investigations carried out at the nearby Misery pit, it is reasonable to assume that the Lynx pit will be excavated wholly within permafrost with no connection to the deep, sub-permafrost groundwater regime.

16.4.8.4. Operations

The current Ekati system of open pit operation management has been extended to include the Lynx operation. The operation is supported with mobile support and supply trucks (crew buses, explosive, fuel, water, sewage, etc.) from the Misery site. Power is supplied by a dedicated generator.

Minimal surface infrastructure is required to operate the Lynx pit other than a small lunch room, field office complex and washroom facilities. This is also available for use as an emergency storm shelter with first aid room and emergency supplies. Personnel are bussed in from the Misery camp at shift start and end.

Kimberlite will be hauled directly from the pit benches to the Misery stockpile area. Waste rock will be hauled to the final waste rock storage area. For the Lynx pit, it is planned that the Ekati standardized equipment fleet combination would be employed consisting of hydraulic shovel / excavators with a bucket capacity of 16 m^3, wheeled loader with bucket capacity of 17 m^3, rotary blast hole rig drilling at 270 mm diameter and a diesel ITH hammer drill rig capable of drilling a 152 mm or 203 mm diameter hole size up to 30 m in length. The standardized equipment fleet is discussed in Section 16.6.

The equipment fleet for the Lynx open pit is a combination of new equipment as well as continued usage of the existing open pit fleet.

Mining operations have been temporarily suspended at Lynx after the process plant incident in late June (refer to Section 17.1). Mining is scheduled to resume in October 2016.

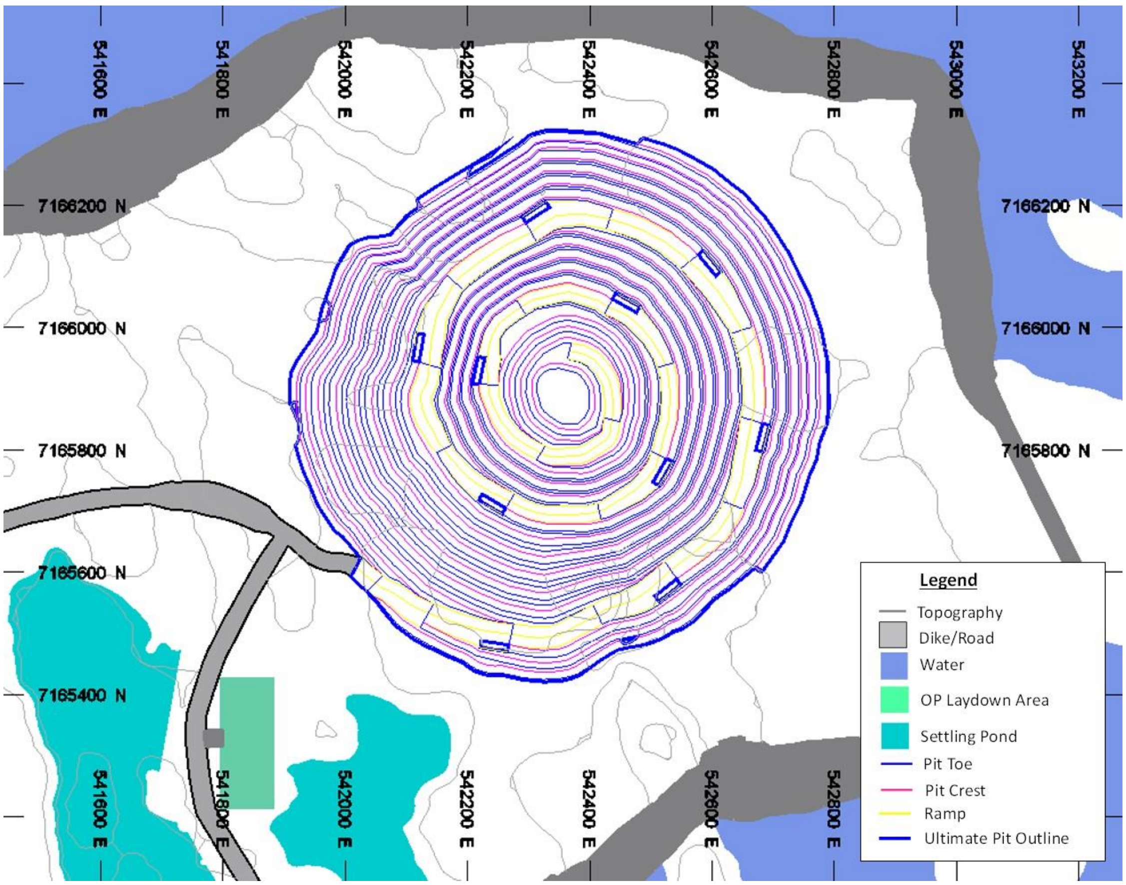
16.4.9 Jay Open Pit

16.4.9.1. Status and Design

The planned Jay open pit is located about 7 km from the existing Misery pit and about 30 km from the Ekati process plant. The Jay pipe is located within a large lake (Lac du Sauvage) and will require construction of a containment dike with subsequent de-watering prior to the start of mining activities. The ultimate pit design will mine 44.7 Mt of dry ore, containing 1.76 cpt, at a strip ratio of 3.0 (waste to ore). The overall material movement will be approximately 181 Mt.

Plan and isometric views of the Jay pipe are included in Section 7 as Figure 7-14 and Figure 7-15 respectively. The proposed mine design layout as envisaged in the feasibility study for the Jay operation is included as Figure 16-2.

Figure 16-2: Conceptual Layout Plan, Jay



Note: Figure prepared by Dominion, 2016.

Whittle was used to produce a series of nested pit shells. The pit was designed assuming 225 t haul trucks will be utilized to haul both ore and waste. A trade-off study was completed to determine that 225 t haul trucks would be the most effective hauler for the Jay pit.

A separate trade off study was also completed to determine an appropriate elevation to switch the haulage ramp from double to single lane to minimize the strip ratio of the pit. Ramp design considerations include runaway lanes or impact barriers.

The designed pit is approximately 900 m by 900 m and has a surface area of approximately 60 ha. The distance from the dike to the closest edge of the ultimate pit shell is approximately 145 m. The design pit has a 34 m wide ramp, double bench (30 m) configuration in granite and metasediment, single bench (15 m) configuration in kimberlite, and single bench (10 m) configuration in the overburden.

Ore production at Jay is set to begin at the beginning of 2022, with Phase 1 kimberlite being processed and stockpiled through 2022 and 2023. Phase 2 mining begins in 2024, and the plant feed will primarily come from stockpiled ore until Phase 2 kimberlite can be mined in 2025. Pit ore production ramps up in 2027 to just over the annual plant production (4.35 dry Mt).

16.4.9.2. Geotechnical

Pit slope information was obtained from design recommendations provided by Golder (2016). Golder conducted limit equilibrium stability analyses to assess the potential for overall slope failure. The stability analyses indicate that the overall pit slopes would meet the minimum design acceptance criteria of factor of safety greater than or equal to 1.3. Golder estimated overall slope angles (OSAs) based on inter-ramp slope angles (IRAs) and the assumption that the access ramp will intersect all rock types at least twice before exiting the pit. The geotechnical assessment allowed the granite slopes, which comprise of the majority of the final pit wall, to be steepened by approximately 7° in some sectors. This increase in slope angle will have a positive effect on the overall strip ratio of the pit.

Slope design parameters for the Jay open pit operation are as indicated in Table 16-6.

Table 16-6: Slope Design Parameters, Jay

Rock Type	Wall Dip Direction (°)	Bench Face Angle (°)	Bench Height (m)	Berm Width (m)	Inter-ramp Angle (°)	Overall Slope Angle * (°)
Granitoid	180 to 270	75	30	13	55	50
	270 to 360	75	30	11.5	57	52
	0 to 90	75	30	12	56	51
	90 to 180	80	30	11.5	61	56
Metasediments	330 to 360	70	30	11.5	53	46
	0 to 90	60	30	12	46	46
	90 to 120	65	30	11.5	50	46
Overburden	0 to 360	60	10	9.5	33	33
Kimberlite	0 to 360	60	15	9.5	40	37.5

Note: * The overall slope angle for the metasediments was assumed to be 46° because Whittle software has difficulties changing between slope angles when there are abrupt changes to the wall angle over a short distance.

16.4.9.3. Hydrogeology and Dewatering

Lac du Sauvage is generally a shallow lake, which is suitable for developing an in-lake dike and exposing the lakebed overlying the Jay pipe. The dike will be designed to meet local regulations and the Canadian Dam Association's Dam Safety Guidelines (CDA, 2013). The dike will be constructed within the lake before dewatering.

The Project conceptual dike design includes the following general components:

- A broad rockfill shell;
- A central zone of crushed aggregates (fine and coarse filters);
- A composite low-permeability element along the centreline of the dike.

Geotechnical instrumentation will be installed within the dike structure and foundation to monitor the performance of the dike during dewatering and operation. The instrumentation will monitor the physical performance of the dike to confirm that the structure is operating according to the design intent. Monitoring will continue until the dike is breached at closure.

A diversion channel (Sub-Basin B Diversion Channel) will be constructed before dewatering to intercept and divert runoff from Sub-Basin B to Lac du Sauvage south of the Jay Dike. The diversion design is considered appropriate to mitigate the risk of pit flooding during extreme seasonal peaks.

Two runoff sumps will be located in a natural depression within the diked area west of the planned Jay pit. The Jay runoff sumps will collect surface mine water that drains toward the diked area.

As part of the water management system, pumping systems will be constructed between the Jay site and the Misery pit, and from the Misery pit to the Lynx pit. Each pumping system will consist of a pump station and a pipeline.

16.4.9.4. Operations

The Jay project includes the use of existing and new infrastructure at the Ekati Diamond Mine. Existing infrastructure, such as the current processing plant, main camp, airstrip, and Misery Road, will continue to be used as the mine life is extended with the processing of ore from the Jay pit. New infrastructure, such as a new truck shop, an expanded Misery camp, and the Jay access road, will be developed between the existing Misery site and the western shore of Lac du Sauvage to facilitate construction of the Jay water-retaining dike and the dewatering and operational pumping and pipeline systems. Following dewatering of the diked area, infrastructure such as a kimberlite ore transfer pad will be developed to support open-pit mining of the Jay kimberlite pipe.

The mine design includes:

- Continued use of the Ekati main camp, processing plant, airstrip, and all other related facilities;
- Continued use of the Misery Road;
- Deposition of fine and coarse processed kimberlite into the mined-out Koala and Panda open pits;
- Modifications to the processing plant to efficiently process Jay ore;
- Use of power line from Ekati power plant to Misery camp;
- Ongoing progressive reclamation activities of areas with no further operational value (e.g., certain areas of the Long Lake Containment Facility and back-flooding of mined-out pits);
- Continued use of the existing Misery camp area facilities (existing truck shop, camp, fuel storage);
- New maintenance facilities sized for Caterpillar (CAT) 793 haul trucks;
- Installation of a 250-bed camp for construction personnel;
- Use of the Lynx pit as a source of construction materials;

- Use of the Lynx pit as a water management facility during Jay dewatering;
- Construction of a laydown area near the Misery waste rock storage area (WRSA) for crushing and stockpiling waste granite excavated from Lynx pit;
- Installation and operation of a crusher to crush waste rock from Lynx pit to produce crushed aggregate material for road and dike construction;
- Installation of a power line from Misery camp to Jay;
- Extension of communications infrastructure from Misery camp to Jay;
- Use of the mined-out Misery Pit as a water management facility during Project dewatering and operations;
- Construction of roads, pipelines, and power lines to Lac du Sauvage from the Misery site;
- Construction of laydown areas at Lac du Sauvage;
- Construction of a water-retaining dike around the Jay pipe, including the North Dike;
- Construction of a diversion channel (Sub-Basin B Diversion Channel) on the west shore of Lac du Sauvage to direct outflow from two drainage areas to the south around the diked area and into the main basin of Lac du Sauvage;
- Potential development of a quarry within the footprint of the WRSA to source non-potentially acid generating (non-PAG) granite rock for dike shell construction material;
- Construction of pumping systems for dewatering and ongoing operational water management;
- Development of the Jay WRSA;
- Pit commissioning components, including construction of operational sumps, haul roads and laydown areas for transportation of ore and waste rock associated with the mining of Jay pit;
- Reclamation and closure of components (pit back-flooding, dike breaching, re-establishing surface flows, and other activities).

The design of these facilities and activities used approaches that have been successfully implemented at the Ekati Mine and other northern mines. The existing Ekati mine environmental monitoring, management, and mitigation programs will be expanded to incorporate the activities proposed for the Jay project.

Operation of the mine will include the following activities:

- The Jay pit will be developed using conventional drill and blast techniques. Overburden, waste rock, and kimberlite will be moved by truck-and-shovel operations;
- Mining rock trucks will haul waste rock and overburden from the pit to the Jay WRSA;
- Mining rock trucks will haul kimberlite from the pit to the ore transfer pad, which will be located near the Jay pit;
- Road trains will then haul kimberlite from the ore transfer pad to the processing plant or to a stockpile near the Misery road or processing plant. The haul will be approximately 5 km along the new Jay road and 29 km along the existing Misery road. The use of kimberlite stockpiles will provide operational efficiencies and allows flexibility to maintain a consistent feed rate at the processing plant while accommodating possible brief segmented road closures, if necessary, for poor weather or caribou presence. Kimberlite stockpiles will also be used to manage variability in the strip ratio of mined material over the life of the Jay project, and for blending between various benches of Jay ore together with Sable ore;
- The kimberlite will be processed in the existing processing plant to recover diamonds;
- Water for the processing plant is taken from the existing Long Lake Containment Facility;
- The FPK will be deposited in the mined-out Panda and Koala open pits via pipelines from the processing plant to the pits. This method is currently being used at the mined-out Beartooth pit, and initial results suggest this is a viable and beneficial option. Coarse processed kimberlite will also be deposited in the Panda and Koala open pits;
- Ongoing operational water management will divert natural runoff away from the Jay pit and will include collection of surface mine water and open-pit mine water within the diked area. Open-pit mine water will be pumped to the bottom of the Misery pit. Surface mine water will be pumped to the top of the Misery pit. Beginning in approximately Year 8, water will be drawn from the top of the Misery pit and discharged into Lac du Sauvage through a diffuser.

Once the open pit is completed, mining operations cease and closure will begin.

16.5 Underground Operations

16.5.1 Underground Mining Method Selection

Underground mining methods have been used to extract kimberlite below the Koala North, Panda and Koala open pits. The Koala North underground mine was originally developed as a test mine to prove the SLR mining method for use at Ekati. The Panda pipe below the Panda open pit was then successfully mined by SLR. Valuable knowledge in underground mining at Ekati was gained from mining at both Koala North and Panda pipes. This knowledge was used to guide the selection and design of the mining method for the Koala underground mine. Both the Panda and Koala North Mineral Reserves are fully depleted.

Several mining methods were considered for Koala with SLC selected as having the highest, risk-weighted net present value (NPV) of the options considered. SLC mining development has been completed to the 1810L as of March 2014.

In 2011, it was recognised that recovery of the Koala pipe could be improved by utilising a hybrid SLC/block cave mining method employing draw points arranged in an offset concentric ring configuration on final production levels. Four production levels on 20 m vertical spacing are currently in operation extracting the Koala Mineral Reserve material. The mining method now employed at Koala is termed “incline caving”.

16.5.2 Dilution and Recovery

No grade determination of kimberlite is possible at the face of the production draw point. However, differentiation of kimberlite and waste material is possible at the face, primarily based on rock colour and shape.

Dilution from waste rock is primarily from the kimberlite pipe wall contact, with some internal waste from entrained granite boulder zones. During mining, some waste rock is removed through sorting at the draw-point, as well as at the sizer reject chute. Kimberlite which has been mixed with significant amounts of waste material is stored separately in remucks as ‘rocky ore’ and hauled to surface by truck for sorting in good visibility conditions.

Mixing of ore and waste material is limited as much as possible through the use of good draw control practices. These practices include close monitoring of draw rates and physical scans of the exposed open stope surface to ensure an even rate of draw is maintained across the broken kimberlite / waste material to prevent early waste migration.

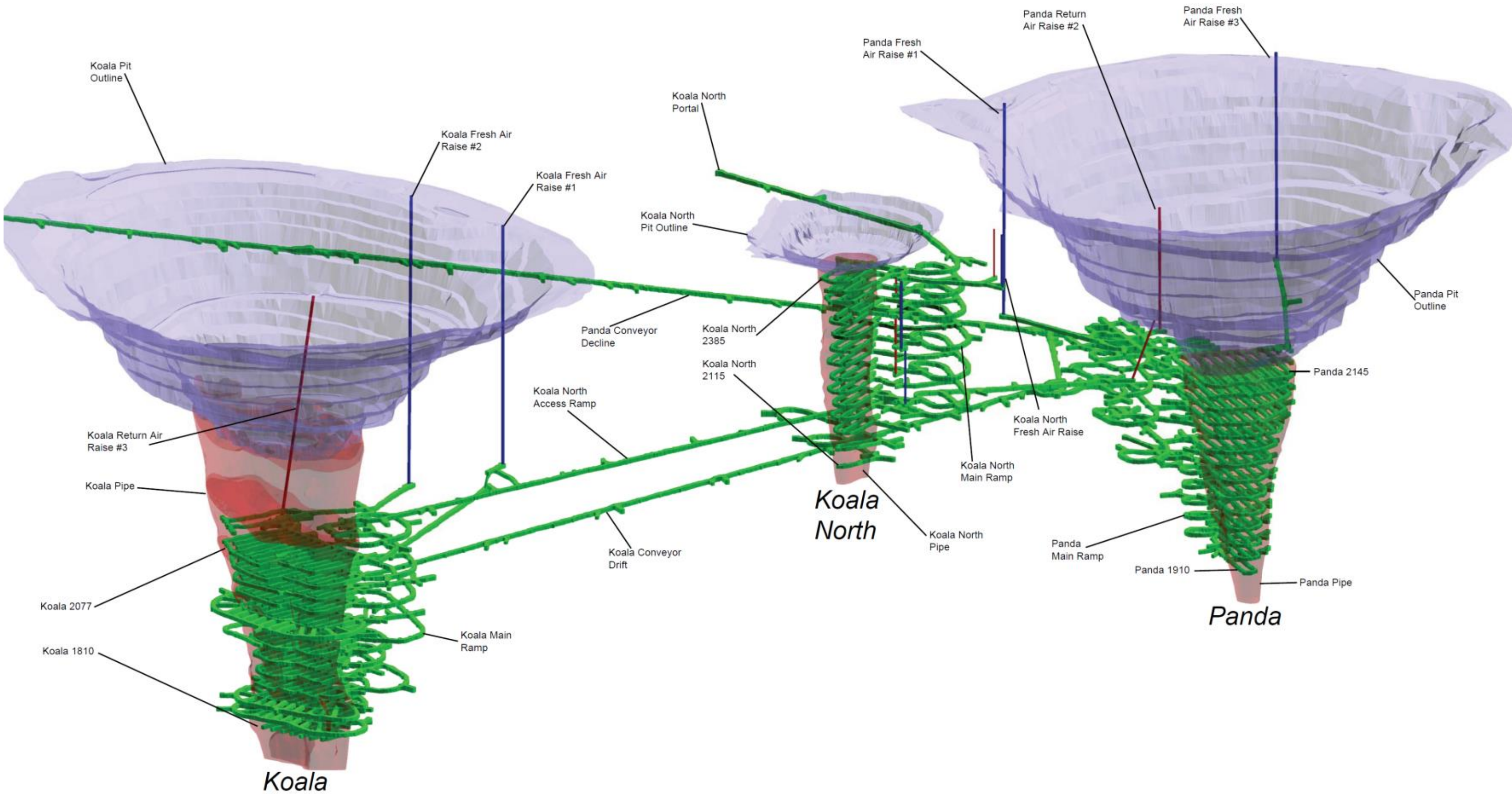
16.5.3 Koala Underground

16.5.3.1. Status and Design

Since production started at Koala underground at the end of 2007 to the end of July 2016, approximately 7.7 Mt of kimberlite has been mined and processed/stockpiled from this part of the pipe.

Figure 7-3 and Figure 7-4 in Section 7 present a plan and isometric view, respectively, of the Koala pipe. A composite 3D view of the Koala, Koala North and Panda underground mines is shown in Figure 16-3.

Figure 16-3: 3D View of Koala, Koala North, and Panda Open Pit and Underground Mines



Note: Figure prepared by Dominion, 2016. Figure is schematic and has no scale.

The Koala mine employs a combination SLC and block cave (BC) mining method known locally as incline caving. The 2050L was the first SLC level mined, and was located 180 m below the Koala open pit floor. From the 2050L to 1970L, ore was extracted using the SLC method only with 14.5 m draw point spacing and 20 m sub-level spacing. Below the 1970L, mining was initially conducted using the SLC method followed by the setting up of an incline cave mining draw point layout with the last draw point level on the 1810L.

SLC levels are accessed from the footwall side of the orebody with retreat from the hanging wall to footwall side of the orebody. Level development consists of waste access from the ramp, with multiple lateral access crosscuts into the ore. Longhole drills are used to drill the ore section above the drift, in an up-hole ring pattern. Blasting on each sub-level starts at the ore/waste contact opposite the access, and retreats, following an approximately straight-line front with adjacent drifts being mined at similar rates.

In a cave mine, mass flow is key to preventing early onset dilution and for mitigating inrush potential. Trials using markers in the broken ore at Ekati have shown narrower than predicted draw cones which can create “chimneys” rather than the desired mass flow during drawdown of the ore. Therefore, a greater number of draw points are required to produce interaction between draw cones and promote mass flow than were originally planned.

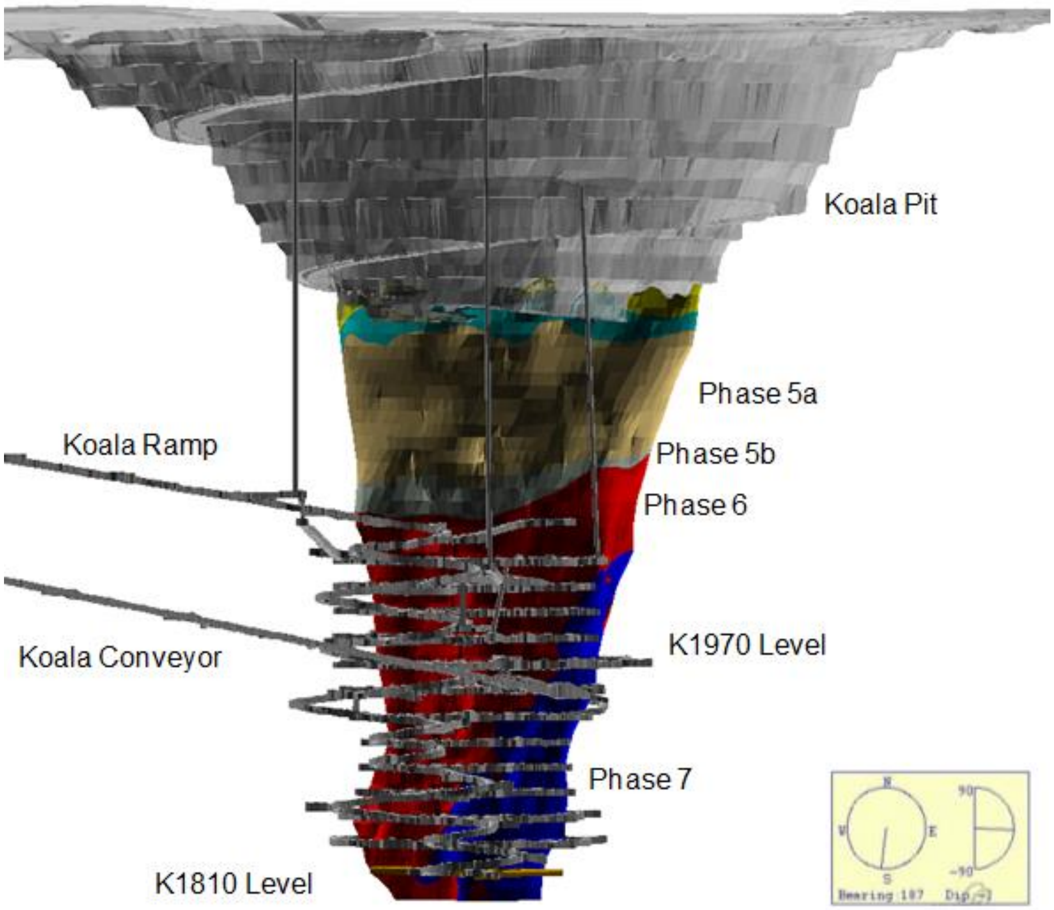
As result of this information a re-design of lower production levels of Koala was completed. This re-design increased the number of draw points thereby enabling even access to the cave footprint for mass flow, and also included an update to the overall geometry of the pipe limits as identified via additional core drilling.

To ensure ore recovery of the Koala orebody is maximised, incline caving is employed on 1970L and below. The transition to incline caving occurred gradually with final production horizons located on 1970L, 1850L, 1830L and 1810L. Intermediate levels between 1970L and 1850L were extracted by SLC.

Given the shape and size of the orebody, incline caving allows sufficient coverage over the footprint for final draw down. The main difference between the SLC operation and the incline cave is that the cave goes from a dynamic (drill and blast) to static state of mining. After initial planned draw from the final rings in each SLC drift is completed, overdraw is strategically targeted over the four permanent production levels to maximise carat recovery while minimising mud inrush potential.

Figure 16-4 is a 3D view of Koala underground showing the various kimberlite phases and mine development.

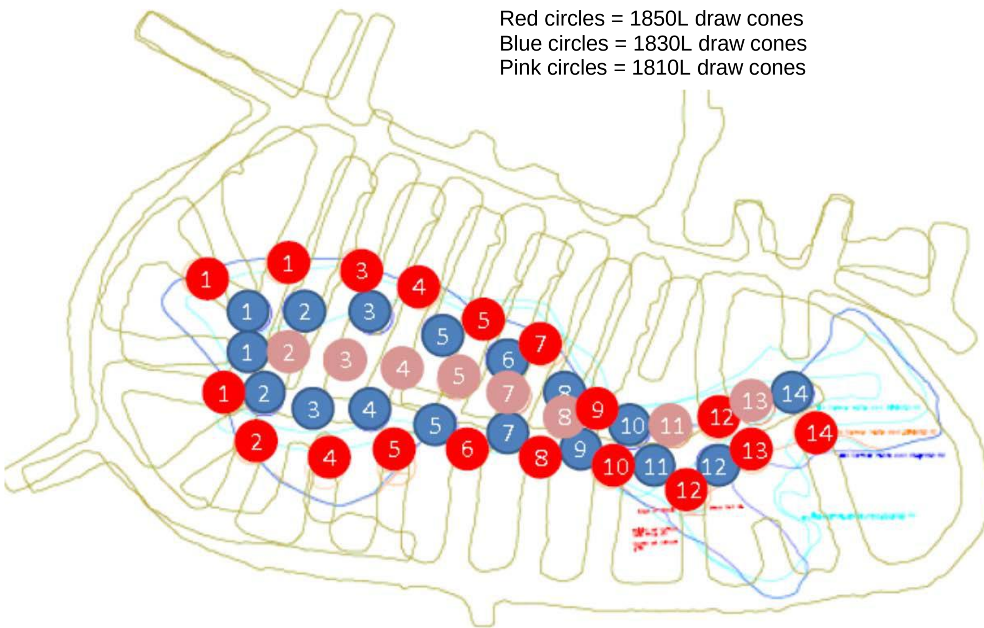
Figure 16-4: Koala Underground – 3D View Showing Development



Note: Figure prepared by Dominion, 2016.

1970L is also the main materials handling horizon and so also includes ore storages and access to the base of the conveyor not present on lower levels. Figure 16-5 illustrates improved draw via the evenly-spaced draw cones achieved by utilising concentrically-placed draw cones on progressively lower levels.

Figure 16-5: Concentric Arrangement of Draw Points in the Incline Cave below 1970L



Note: Figure prepared by Dominion, 2016.

16.5.3.2. Koala Geotechnical

The Koala cave was induced in accordance with the feasibility study design. The cave initially broke through to the base of the Koala pit after approximately six months of production in May 2008, and in December 2014 the majority of the kimberlite rock mass in the base of the pit was showing greater than 130 m of vertical movement down. Phase 5 material, originally located in the crown pillar between the Koala SLC and open pit has caved and now starting to report to draw points as far down as 1830L.

Ongoing development of the glory hole is measured using terrestrial survey methods (prisms and I-SiTE surveys) or by using aerial unmanned aerial vehicle (UAV) mounted camera techniques.

The following underground geotechnical programs are in place in to ensure the long-term stability of infrastructure required for the continuation of underground mining at Ekati: drive closure monitoring; surveillance photographs; structural mapping; and instrumentation including extensometers, thermistors, TDR and “smart cable” extensometer-enabled cable bolts. Daily visual inspections of ground and ground support conditions in production workings are also an integral part of the geotechnical program.

16.5.3.3. Production Draw Control

A shift-by-shift cave draw plan is developed and compliance is measured daily. As part of the duties of the draw control technicians, mud inrush risk assessment in each draw point is performed. The status of each draw point is identified on the daily draw control plan issued to operations. Periodic inspections of all active draw points in the mine are performed to assess wet muck flow potential, hang ups, geotechnical concerns, and geologic conditions.

16.5.3.4. Koala Hydrology and Hydrogeology

The hydrogeologic model for Koala was constructed on the understanding that groundwater movement is dominated by fracture flow within the granodiorite rock mass. Consequently, development of a structural model for the fault systems influencing groundwater flow was a key step in understanding the groundwater regime.

The surface diversion system (ditches, sumps, adit and pumps) removes approximately 85,000 m^3 from the annual average inflow based on available pumping data. The surface diversion system was designed for a 1:100 year storm event.

The in-pit diversions collect from a further 0.22 km^2 of in-pit areas removing approximately 23,000 m^3 of annual runoff. The in-pit diversions will minimize any overflow to underground from the area of the pit above 2300 elevation, provided that a storm greater than the 1:10 year average does not occur.

Groundwater inflows are estimated over the winter months when it is assumed that surface water is frozen and so all water pumped from underground is groundwater. Groundwater inflows progressively increased from production start in 2007 through to 2010. Since 2010, the drawdown in the groundwater regime appears to have stabilized with relatively constant year on year groundwater flows.

16.5.3.5. Mud Rushes

Wet muck flow events, called mud rushes, have occurred in the Koala workings, in particular during extraction of the Phase 5 kimberlite material, which has a high moisture content and degrades readily, and future mud rushes are possible.

For a mud rush to occur, four elements must be present: mud-forming material, water, disturbance and a discharge point through which the mud and water can enter the workings. Only two of these components are manageable (disturbance and water). Dominion is treating any wet draw point (>15%) moisture that has a significant amount of fines (>25%) as a high-risk area during operations.

Key initiatives to mitigate mud inrush are:

- Redesign of the lower levels of Koala (1970L, 1850L, 1830L and 1810L) to improve drainage;
- Improved drainage infrastructure between 1970L and 1930L;
- Redesign of the lower levels to promote mass flow;
- Tele-remote mucking for all at risk areas of the mine;
- Adherence to even, controlled draw;
- Exclusion areas for human access into risk areas during active cave draw; approved access only after level scans and mud rush risk inspections;
- Improved surface water management to minimise water ingress to the cave including:
  - Installation of strategic surface sumps and pumping capacity to limit run-off to Koala pit;
  - Multiple runoff capture points along the Koala pit ramp.

16.5.4 Consideration of Marginal Cut-Off Grades for Underground

Cut-off grades are not used for underground mining either in initial planning or in operations. All kimberlite/waste reporting to the draw points is removed until fixed draw tonnages have been reached for cave management purposes.

16.5.5 Underground Access and Materials Handling

The Koala, Koala North, and Panda pipes are located in a row and relatively close to each other. The initial underground development and infrastructure was provided for the Koala North underground test mine and then for the Panda underground. Both an access ramp and a conveyor ramp were constructed to access these two mines and later this infrastructure was extended to Koala underground.

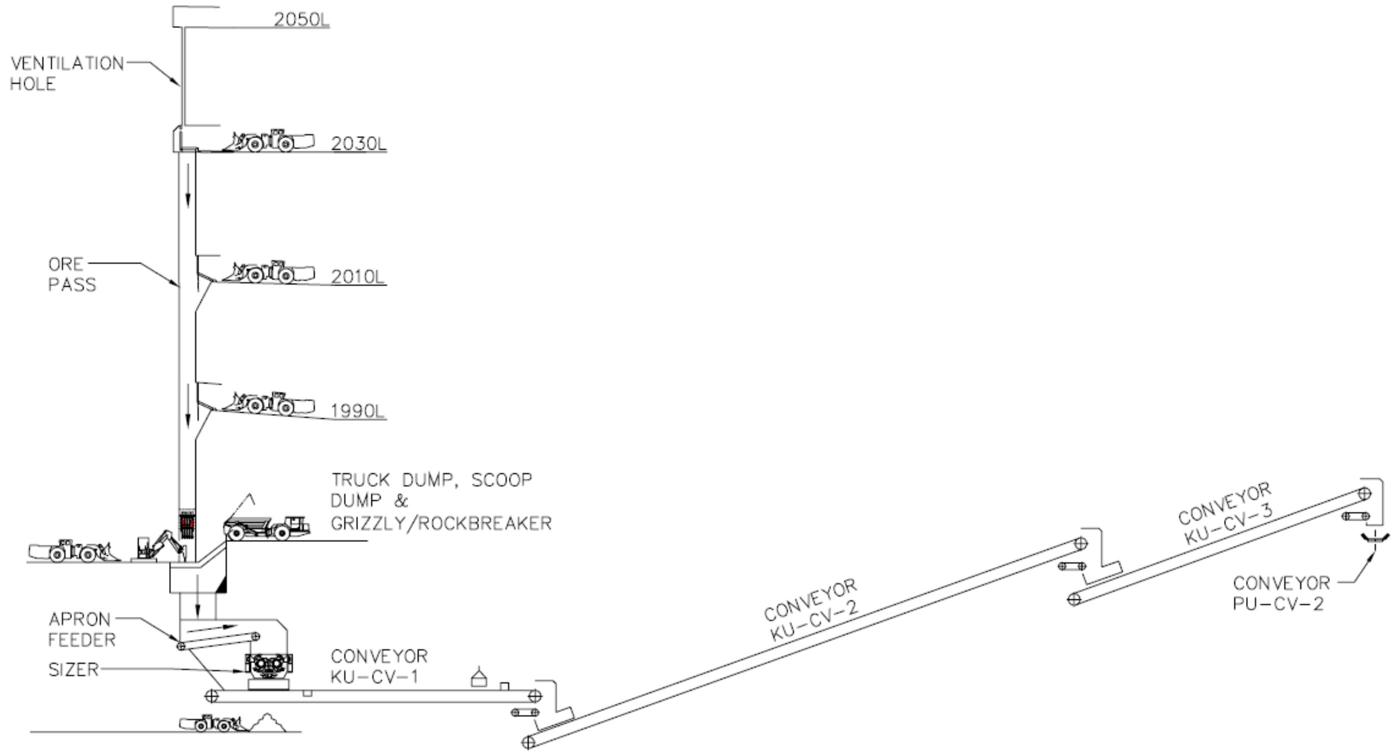
Access from surface to the Koala and mine for personnel and materials is provided via a 5.5 m wide x 5.5 m high ramp driven at a -13% gradient. A second 6.0 m wide x 5.0 m high ramp at a -15% gradient is used to transport kimberlite from the mine via a conveyor system. The conveyor ramp daylights adjacent to the process plant (via surface portal) and continues to the upper third of the Panda pipe with an additional leg developed to the Koala pipe. The 1.37 m (54”) wide conveyor system is hung via chain from the back of the ramp and consists of four main underground conveyor sections plus a surface “stacker” conveyor, with a transfer arrangement between each conveyor.

All production mucking from the draw points is carried out using load haul dump (LHDs) units tramming to the remuck bays or loading 28 t capacity diesel haulage trucks. Ore from Koala is either dumped directly into the grizzly or stored in one of three remucks on Koala 1970L, and fed to a sizer and conveyor system which joins the main conveyor system from Panda to the process plant. A magnet and metal detector are used on this conveyor for tramp metal removal to protect the conveyor belt and upstream systems.

On surface, the radial slewing stacking conveyor discharges to ROM surface stockpiles with a capacity of approximately 8,000 t.

All waste and rocky ore from underground is hauled to surface via the Koala North ramp utilizing 28 t capacity diesel haulage trucks. Waste granite is removed to the main waste rock dump by surface operations crews. The rocky ore is sorted (i.e. the granite is removed), and the resulting ‘clean’ kimberlite is trucked to the process plant. The Koala ore handling system is shown in Figure 16-6.

Figure 16-6: Koala Ore Handling System



Note: Figure prepared by Dominion. Figure dated 2006; levels are at 20 m intervals.

Typically, crushers (single or double toggle jaw, or gyratory type) are employed in underground metal mines; however, the material characteristics of the Ekati kimberlite prevent consistent and reliable flow through these types of crushers. Mineral sizers, with their rotary crushing action have proven very effective with this ore type. A MMD1000 primary sizer unit is installed in the Koala ore handling system; which is designed to accept "oversize" feed as large as 1,000 mm in any dimension into the sizing chamber with a crushed product output size of 150 mm or less. The rated crushing capacity of this unit is 500 t/h.

To provide secondary egress from the production mining levels, 2.1 m x 2.1 m escapeway raises equipped with ladders are installed between the production mining levels.

The escapeways in Koala are located next to the fresh air raise access on the extraction drift. This placement provides positive air pressure for the escapeway. The positive pressure prevents smoke originating from draw points west of the escapeway from entering the escapeway ladder system.

16.5.6 Underground Mine Ventilation

The underground mines at Ekati are ventilated using a push system which consists of two primary fans for Koala mine and one primary fan for the Panda mine area. The air is pushed underground via raise bored shafts to the top of each mine from where a series of inverse raises feed fresh air to each level and haulage way. Surface primary fans are equipped with heaters to ensure the air entering the mine is approximately 4°C. The main purpose of heating the air is to prevent water from freezing, particularly dewatering pipes.

The Koala mine is ventilated using two 600 HP 101.25" diameter fans located on top of KFAR#1 and KFAR#2 raise-bored shafts. These fans push approximately 400 kcfm of fresh air into the mine. KFAR#1 ventilates all of the active levels while KFAR#2 ventilates the haulage ramp. Return air from Koala production levels is exhausted via KRAR#3 raise. Air flow on each level in Koala comes down the fresh air raise (FAR) on the east side of the level and is exhausted to the return air raise (RAR) on the west side of the level. The ramp and the conveyor in Koala are also used as a secondary return airway.

As mining is complete on each level, the level is sealed from the ventilation circuit. This helps to maintain ventilation pressures as mining progresses down.

The Panda area is ventilated by one 600HP 101.25" diameter fan located on top of PFAR#1 raise bored shaft. This fan pushes approximately 200 kcfm of fresh air into the mine. It feeds fresh air to the conveyor drift and the materials supply ramp. A small quantity of air also exhausts up the Panda RAR#2 raise-bored shaft to allow for adequate ventilation of the 2145L workshop.

16.5.7 Explosives

No explosives are currently used for Mineral Reserve recovery in underground operations at Koala.

16.6 Mining Equipment

16.6.1 Open Pit

16.6.1.1. Current Equipment

The existing Ekati open pit equipment fleet has proven to be functional in its application at the Panda, Koala, Beartooth, Misery and Fox pit operations. Two standard fleets are planned: 777 trucks with 992 loaders and 6030 shovels for Pigeon/Misery, and 793 trucks with 994 loaders and 6060 shovels for Lynx, Sable, and Jay.

Equipment standardization is considered critical as part of the design phase as it minimizes the downstream effects on:

- Recruitment and training requirements – operational and maintenance;
- Maintenance plans and procedures;
- Spare parts procurement and warehousing including inventory levels.

Standardizing equipment at Ekati also allows the use of suppliers who are already familiar with the requirements of Ekati and can accommodate them more readily.

The standard truck loading and haulage equipment consists of hydraulic shovel/excavators with a bucket capacity of 12 m^3 and 90 t capacity off-road haul trucks. A CAT 992G front end loader is used as a back-up loading unit for the primary excavator and shovel. There are two 170 t capacity haul trucks in the fleet which are used for various haul routes around the Ekati main site. A fleet of 80 t capacity Haulmax haulage trucks and two 210 t capacity dual power road trains (DPRTs) are used for the 29 km ore haul from the Misery stockpile area.

Currently the main production drill is a rotary blast hole rig drilling at 270 mm or 251 mm diameter holes for the larger production blasting away from the high walls and kimberlite blasting. A diesel ITH hammer drill rig capable of drilling a 152 mm or

203 mm diameter hole size up to 30 m in length is used for the high wall 'pre shear' pattern and the 'trim / buffer' patterns on each 10 m deep bench adjacent to the final high wall. A top hammer rig is used for secondary drilling for hard bench toes, oversize material and to assist in the pit.

Support equipment for the mining operation includes a CAT D10 track dozer for mine surface civil construction, dump construction and maintenance and a CAT 16 wheeled grader for road construction and maintenance. Some support equipment is and will be shared with the main Ekati hub. These will include a water truck for haul road dust suppression and drill service water transport, sewage and solid waste management vehicles, mechanical / electrical maintenance service trucks, and other support light vehicles. Fixed equipment includes pit perimeter light plants and in-pit pumps.

The open pit mobile equipment fleet at Ekati is shown in Table 16-7.

Table 16-7: Open Pit Mobile Equipment Fleet

Mobile Equipment	Capacity	No. Units
Sandvik D90KS Rotary Drill	—	1
Atlas Copco Pit Viper 275 Rotary Drill	—	1
Sandvik D75KS Rotary Drill	—	1
IR45 Hammer Drill	—	3
Sandvik Ranger DX800 Drill	—	2
Caterpillar 777 Haul Truck	90 t	24
Caterpillar 789 Haul Truck	170 t	2
Caterpillar 793 Haul Truck	225 t	2
Haulmax Haul Truck	80 t	6
Dual Power Road Train	210 t	2
Komatsu PC1800 Excavator	11 m^3	2
Hitachi EX1900 Shovel	12 m^3	1
Cat 6018 Excavator	10 m^3	2
Caterpillar 992 Loader	9.45 m^3	7
Caterpillar 994 Loader	17 m^3	1
Caterpillar 375 Excavator	4.4 m^3	1
Caterpillar 390D Excavator	4.6 m^3	1
Caterpillar D10 Dozer	—	7
Caterpillar 16H/M Grader	—	8
Caterpillar 777B/C 100T Truck - Haul/Sand/Water	—	3
Caterpillar 988G/H Wheeled Loader	6.4 m^3	2
Caterpillar IT28 Wheeled Loader	—	3

16.6.1.2. Planned Equipment

A load and haul equipment trade-off study was completed for the Sable and Jay pits. Various combinations of mixed fleet scenarios were reviewed. The study concluded the use of a larger class truck and shovel fleet for both ore and waste proved economical.

The major types of mining equipment assumed for future operations at Jay, which would be shared with Sable, included:

- Shovel and loaders:
  - 34 m^3 hydraulic shovel;
  - 17 m^3 wheel loaders;
  - 12 m^3 wheel loaders;
- Alternative available loading units (not included in schedule):
  - 16 m^3 hydraulic shovel;
  - 7 m^3 hydraulic excavators;
- Haul trucks:
  - 225 t haul trucks;
- Alternative available hauling units (not included in schedule):
  - 90 t haul trucks.

The 17 m^3 loaders will be used to load both ore and waste into the 225 t haul trucks, whereas the shovels will only load waste into the 225 t haul trucks.

16.6.2 Underground

The underground mobile equipment fleet at Ekati is shown in Table 16-8.

Table 16-8: Underground Mobile Equipment Fleet

Mobile Equipment	Capacity	No. Units
Elphinstone R2900 LHD Loader	10.5 t	2
Elphinstone R1700G LHD Loader	8.0 t	8
Caterpillar Elphinstone AD45 Haul Truck	28 t	7
Tamrock Axera D07 S-260-C Jumbo	—	1
Maclean Bolter	—	1
Tamrock Longhole Solo 07-7F	—	2
420EIT Wheeled Loader Shotcreter	—	2
Caterpillar IT28G Wheeled Loader	—	4
CAT120 Grader	—	2
Getman A64 ANFO Truck	—	1
Getman A64 Scissor Lift	—	1

16.7 Consideration of Process Plant Throughput Rates

The Ekati processing plant had an original design capacity of 9,000 dmt/d. FY18 (2017) planned capacity is 11,250 tpd at an OEE of 83.4%. This will be achieved by various efficiency improvements including the screen panel change out and the introduction of the Fines DMS circuit. Further efficiency improvements are planned to achieve 12,000 dmt/d in conjunction with the Jay project.

16.8 Mine Plan

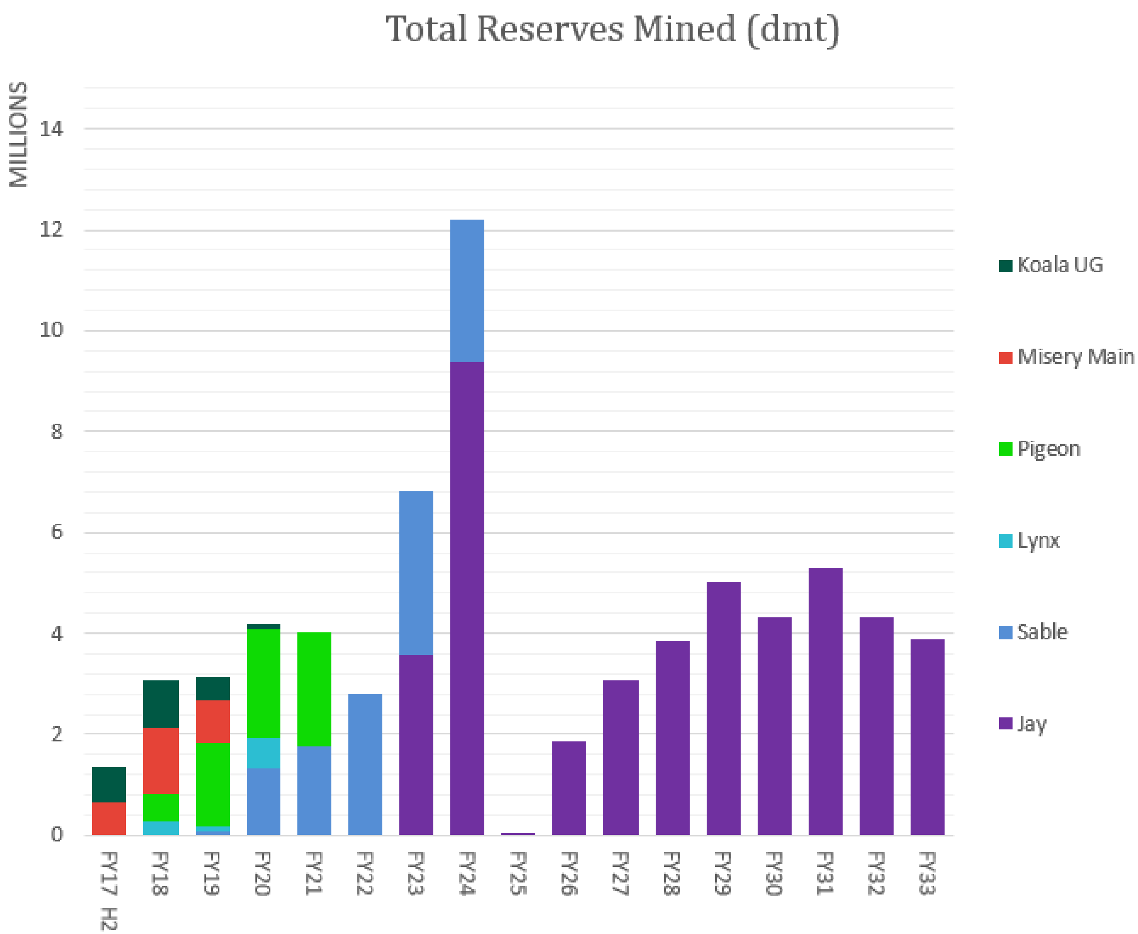
16.8.1 Mineral Reserves Base Case Mine Plan

The Mineral Reserves Base Case Mine Plan provided in Table 16-9 is the base case mine plan for the Project, and is based on Mineral Reserves only. This plan assumes production from Misery, Pigeon, Sable, Lynx and Jay open pits, and the Koala underground operation. The ore tonnes mined per source is shown in Figure 16-7.

Table 16-9: Mineral Reserves Base Case Mine Plan Production

Area	Item	Pipe	Mineral Reserves Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Waste Mined (wMt)		Total	305.64	10.90	26.01	28.44	31.02	27.88	30.64	21.22	19.20	31.62	27.88	14.01	12.88	10.54	7.35	4.04	1.51	0.51	—
Ore Mined (dMt)	Underground	Koala	2.20	0.69	0.96	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	2.80	0.66	1.30	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	6.63	—	0.55	1.66	2.17	2.25	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—		0.07	1.32	1.75	2.79	3.25	2.80	—	—	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	3.57	9.39	0.03	1.88	3.07	3.83	5.04	4.34	5.31	4.33	3.88	—
Ore Processed (dMt)	Underground	Koala	2.40	0.81	1.04	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	2.93	0.50	0.98	0.85	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	7.31	—	1.21	1.68	1.32	2.28	0.82	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—	—	—	1.39	1.75	2.30	3.27	1.24	1.24	0.78	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	1.09	3.11	3.11	3.57	4.35	4.35	4.35	4.35	4.35	4.35	4.35	3.33
Carats Recovered (M cts)	Underground	Koala	1.30	0.38	0.57	0.28	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	15.07	2.36	4.59	4.47	3.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	3.46	—	0.53	0.71	0.67	1.17	0.38	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	10.15	—	—	—	0.93	1.30	2.06	3.04	1.13	1.04	0.66	—	—	—	—	—	—	—	—
		Lynx	0.76	—	0.19	0.10	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	78.64	—	—	—	—	—	—	1.39	4.49	3.94	4.77	6.14	6.67	7.89	8.71	9.55	9.51	9.15	6.44
Grade (cpt)	Underground	Koala	0.54	0.47	0.55	0.63	0.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	5.15	4.71	4.67	5.29	6.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	0.47	—	0.44	0.42	0.51	0.51	0.46	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	0.85	—	—	—	0.67	0.74	0.89	0.93	0.91	0.84	0.84	—	—	—	—	—	—	—	—
		Lynx	0.77	—	0.69	0.85	0.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	1.76	—	—	—	—	—	—	1.28	1.44	1.27	1.34	1.41	1.53	1.81	2.00	2.19	2.19	2.10	1.93

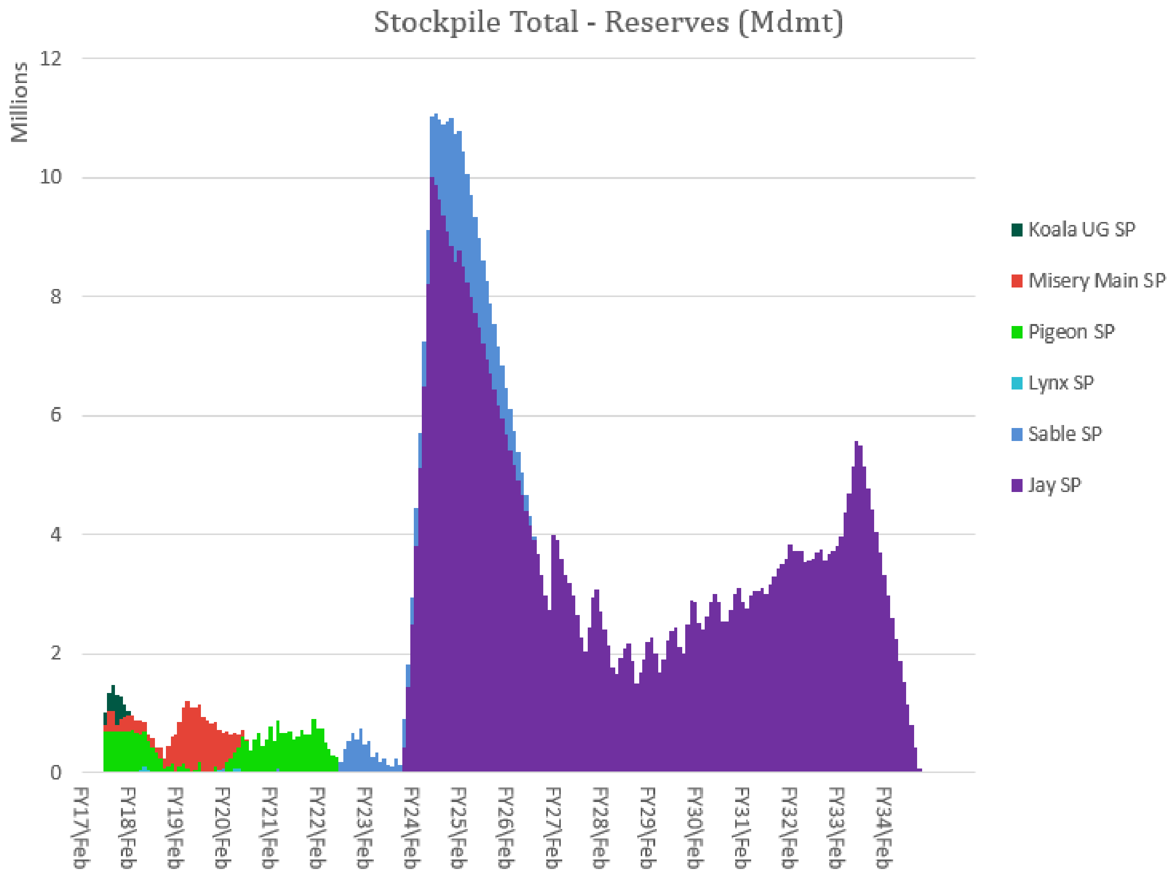
Figure 16-7: Ore Tonnes Mined by Fiscal Year – Mineral Reserves Base Case Mine Plan



Note: Figure prepared by Dominion, 2016.

From FY24 (CY2023) onward, the ore processing rate becomes a constraint and significant ROM stockpiles are required for Sable and Jay (Figure 16-8).

Figure 16-8: Stockpiles by Fiscal Year – Mineral Reserves Base Case Mine Plan



Note: Figure prepared by Dominion, 2016.

16.8.2 Operating Case Mine Plan

Investors are cautioned that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability and are further cautioned that the Operating Case Mine Plan includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the Operating Case Mine Plan will be realized.

Substantial quantities of kimberlite within the Misery South and Misery Southwest Extension occurred within the stripping limits of the Misery pushback open pit prior to mining operations in the pushback pit.

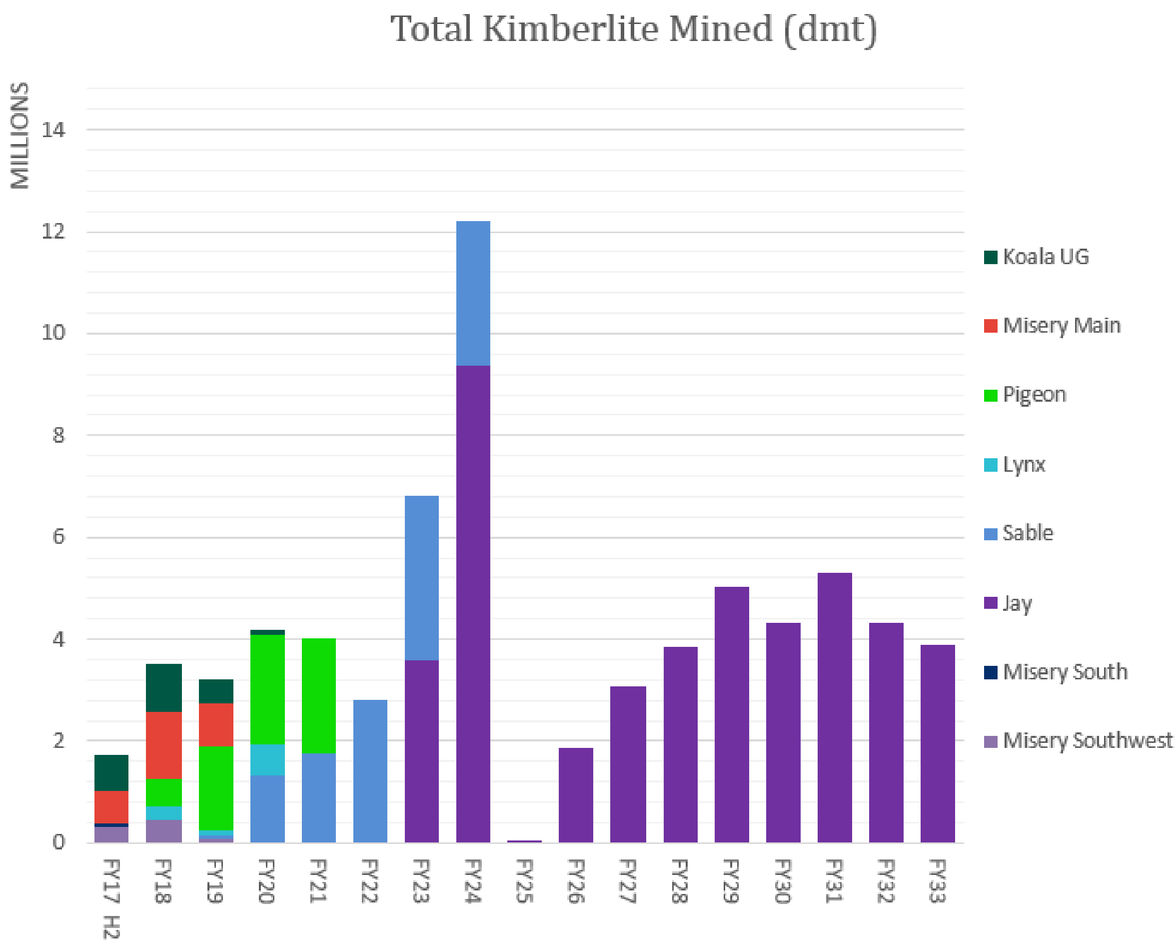
The Inferred Mineral Resource estimate for the Misery South and Misery Southwest Extension kimberlites is based on information obtained from drill core, microdiamond sampling, and surface bulk sampling (refer to Sections 10, 11 and 14).

Misery South and Misery Southwest Extension kimberlitic material was excavated, separately stockpiled and processed during the pre-stripping operations of the Misery Main pipe. Additional Misery South and Misery Southwest Extension material is being mined and stockpiled along with Misery Main Mineral Reserves as the open pit mining continues. It is planned to process the material through the Ekati plant under the Operating Case Mine Plan (Table 16-10), which is a scenario that has the Misery South and Misery Southwest Extension material included in addition to that in the Mineral Reserves Base Case Mine Plan. The total kimberlite tonnes mined per source is shown in Figure 16-9.

Table 16-10: Operating Case Mine Plan Production

Area	Item	Pipe	Operating Case Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Waste Mined (wMt)		Total	305.64	10.90	26.01	28.44	31.02	27.88	30.64	21.22	19.20	31.62	27.88	14.01	12.88	10.54	7.35	4.04	1.51	0.51	—
Ore Mined (dMt)	Underground	Koala	2.20	0.69	0.96	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	2.80	0.66	1.30	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	6.63	—	0.55	1.66	2.17	2.25	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—		0.07	1.32	1.75	2.79	3.25	2.80	—	—	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	3.57	9.39	0.03	1.88	3.07	3.83	5.04	4.34	5.31	4.33	3.88	—
Mill feed mined (dMt)	Open Pit	Misery South	0.06	0.06	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SWE	0.82	0.31	0.44	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ore Processed (dMt)	Underground	Koala	2.40	0.81	1.04	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	2.93	0.50	0.98	0.85	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	7.31	—	1.21	1.68	1.32	2.28	0.82	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—	—	—	1.39	1.75	2.30	3.27	1.24	1.24	0.78	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	1.09	3.11	3.11	3.57	4.35	4.35	4.35	4.35	4.35	4.35	4.35	3.33
Mill feed processed (dMt)	Open Pit	Misery South	0.12	—	—	—	—	—	0.12	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SWE	1.04	—	0.49	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carats Recovered (M cts)	Underground	Koala	1.30	0.38	0.57	0.28	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	15.07	2.36	4.59	4.47	3.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	3.46	—	0.53	0.71	0.67	1.17	0.38	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	10.15	—	—	—	0.93	1.30	2.06	3.04	1.13	1.04	0.66	—	—	—	—	—	—	—	—
		Lynx	0.76	—	0.19	0.10	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	78.64	—	—	—	—	—	—	1.39	4.49	3.94	4.77	6.14	6.67	7.89	8.71	9.55	9.51	9.15	6.44
		Misery South	0.14	—	—	—	—	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SWE	2.92	—	1.40	1.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grade (cpt)	Underground	Koala	0.54	0.47	0.55	0.63	0.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery Main	5.15	4.71	4.67	5.29	6.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	0.47	—	0.44	0.42	0.51	0.51	0.46	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	0.85	—	—	—	0.67	0.74	0.89	0.93	0.91	0.84	0.84	—	—	—	—	—	—	—	—
		Lynx	0.77	—	0.69	0.85	0.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	1.76	—	—	—	—	—	—	1.28	1.44	1.27	1.34	1.41	1.53	1.81	2.00	2.19	2.19	2.10	1.93
		Misery South	1.23	—	—	—	—	—	1.23	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SWE	2.80	—	2.83	2.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

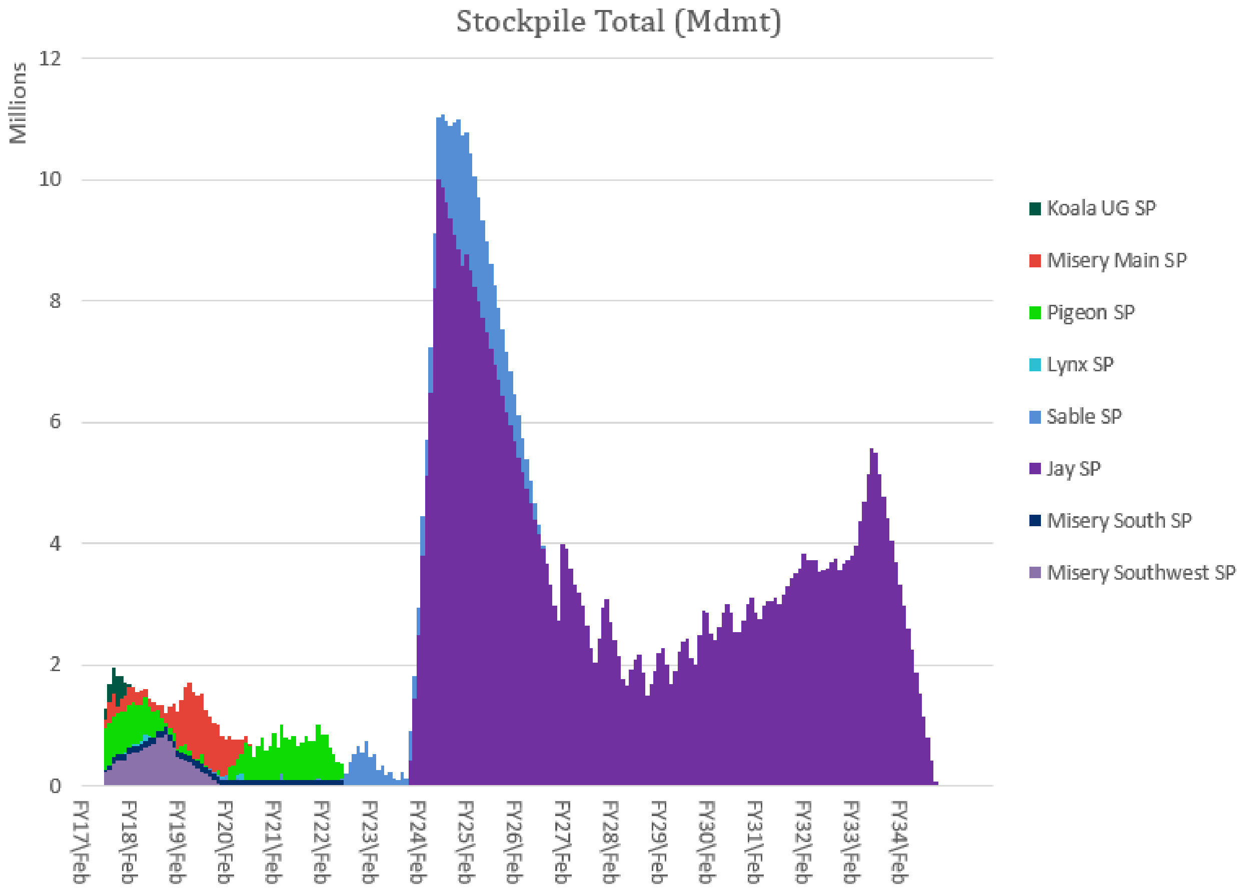
Figure 16-9: Kimberlite Tonnes Mined by Fiscal Year – Operating Case Mine Plan



Note: Figure prepared by Dominion, 2016.

Run-of-mine stockpiles are used from 2H FY17 to FY22 to defer the lower value Misery satellite feeds. More significantly, From FY24 (CY2023) onward, the ore processing rate becomes a major constraint and large run-of-mine stockpiles are required for Sable and Jay ore feeds (Figure 16-10).

Figure 16-10: Stockpiles by Fiscal Year – Operating Case Mine Plan



Note: Figure prepared by Dominion, 2016.

Koala is currently in production as an inclined cave underground operation and is scheduled to finish in 2020.

Mining is in progress at Misery open pit with expected production from the Misery Main having an expected completion of mining in 2018.

Mining of material from Pigeon open pit is in progress with recovery of kimberlite from Phase 1 completed. Phase 2 waste stripping is in progress with pit completion projected to finish in 2019.

Stripping of material from Lynx open pit is ongoing with mining of kimberlite commencing in 2017 and finishing in 2018.

Pre-stripping of material from Sable open pit is scheduled to start in 2018 with mining of kimberlite commencing in 2019 and finishing in 2023.

Pre-stripping of material from the Jay open pit is scheduled to start in 2021 with mining of kimberlite commencing in 2022 and finishing in 2032.

16.9 Comments on Mining Methods

In the opinion of the responsible QPs:

- The estimated mine life for the Mineral Reserves Base Case Mine Plan, based on the Mineral Reserves estimated in Section 15, is 17 years;
- Open pit mining will be carried out using a mixed shovel fleet and trucks; the equipment selection is appropriate for the open pit mine plans;
- Underground equipment selection is appropriate for the underground mine plans;
- Ventilation requirements for the underground operations are appropriate to the mining method selected;
- There is sufficient space within the waste rock storage areas for the waste projections over the Mineral Reserves Base Case Mine Plan;
- Mine design has incorporated geotechnical and hydrogeological considerations appropriate to the Ekati Project setting and mining methods employed.

The key risks to achieving the Mineral Reserves Base Case Mine Plan include:

- Sustained inability to meet Koala underground production target or early closure of the mine due to deterioration in operating conditions;
- Obtaining permits and approvals for the proposed Jay operation;
- Appropriate water management for the Jay operation;
- Granting of permits for additional fine processed kimberlite storage.

Risks to the Koala underground operation have been actively managed by:

- Implementation of tele-remote mucking that removes operators from potential mud rush exposure and ensures continuity of operations;
- Minimization of water ingress to the cave through maintaining surface dewatering infrastructure;
- Redesign and upgrades to drainage infrastructure throughout Koala underground levels.

17.0 RECOVERY METHODS

17.1 Process Flowsheet

The Ekati processing plant had an original design capacity of 9,000 dmt/d. Through various efficiency improvements, the current capacity and budgeted operating rate is 10,800 dmt/d with an overall equipment efficiency (OEE) of 83.4% (FY 2017). Further efficiency improvements are being investigated to achieve 12,000 dmt/d in conjunction with the Jay project.

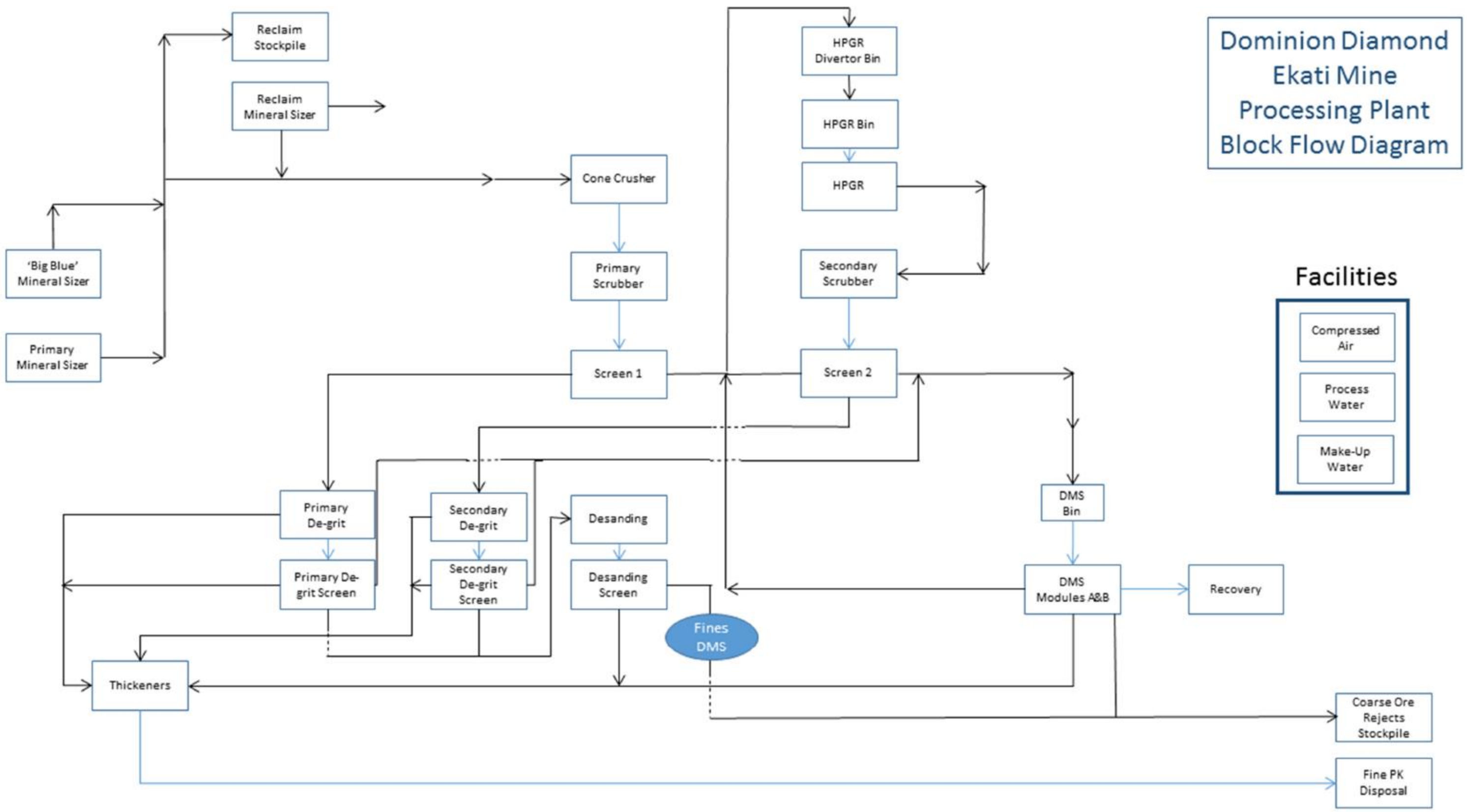
Kimberlite processing operations have been temporarily suspended at the Ekati Diamond Mine due to a fire that occurred in the process plant on June 23, 2016. The damage was limited in spatial extent and repairs are expected to be completed within approximately three months (late September) after which the plant is expected to resume operations at full capacity.

The recovery of diamonds from the processing of the host kimberlite ore at the Ekati Diamond Mine includes (Figure 17-1):

- Primary crushing—redundancy with primary, secondary, and reclaim sizers;
- Stockpiling—used as a buffer between plant and crushing;
- Secondary crushing (wet cone crusher);
- Tertiary crushing and re-crushing for further diamond liberation;
- Sizing, de-gritting, and desanding;
- Dense media separation;
- Final recovery:
  - Wet high-intensity magnetic separation;
  - Wet X-ray sorting;
  - Drying;
  - Dry single particle X-ray sorting;
  - Grease tables;
  - Diamond concentrate weighing and packaging, sorting, and preparation for transport to the Yellowknife sorting and valuation facility.

A sample plant adjacent to the processing plant building is routinely used for diamond recovery audits and for grade control.

Figure 17-1: Process and Recovery Flowsheet



Note: ROM = run of mine; HPGR = high pressure grinding rolls; DMS = heavy media separation; PKI = processed kimberlite impoundment; SPS = single particle sorting; mm = millimetre. Figure prepared by Dominion, 2016.

17.2 Plant Design

The processing plant was designed by HA Simons and Signet Engineering in 1995, utilizing standard diamond liberation, concentration, and recovery processes. The plant was commissioned at the end of 1998 and obtained full production in 1999.

The processing plant critical sizes are as follows:

- DMS feed top cut-off size 28 mm (square);
- DMS feed bottom cut-off size 1.2 mm (slotted);
- Re-crush size -25 +10 mm;
- Coarse rejects -10 +0.5 mm;
- Fine rejects -0.5 mm;
- Recovery:
  - Diamond recovery is based on wet high-intensity magnetic separation, X-ray, grease, and high-intensity magnetic separation for -3 +1 mm and -6 +3 mm sized material, and on X-ray and grease for -25 +12 mm and -12 +6 mm fractions. The final concentrate is hand-sorted off site to improve purity before cleaning and valuation;
  - Recovery tails (-28 +1 mm) are returned to the main treatment plant via the high-pressure grinding rolls (HPGR) circuit.

The Ekati processing plant was designed with a nameplate capacity of 3,000,000 dmt/a. The overall plant utilization target was 85%, equivalent to an operating time of 7,446 h/a or an average plant throughput of 442 t/h or 9,000 dmt/d (calendar day). In the design, it was recognized that the quantity of concentrate produced would be highly variable, ranging from 0.5% to 2.5% of plant-head feed. The recovery plant was designed to treat as much as 1.5% of total head feed on a single 12-hour shift. When higher DMS yields were realized, the recovery plant could be operated for longer periods. Presently the recovery plant is run on a 24/7 basis.

Processing plant modifications made since commissioning include:

- Replacement of the gyratory crusher with an MMD 1300 mineral sizer as the primary crusher;
- Increase in DMS concentrate handling capacity;
- Increase in wet high-intensity magnetic separation circuit capacity;

- Increase in wet X-ray circuit capacity;
- Removal of attrition milling from the recovery circuit;
- Re-commissioning of re-crush circuit in 2015 as the standard operating methodology, with correct pressure, gap and roll speed controls for the HPGR in place; re-crush circuit was previously decommissioned from DMS to the HPGR to increase the plant throughput; option to re-crush on demand was added back in November 2014;
- Replacement of the cone crusher by an increased capacity wet cone crusher;
- X-ray upgrades and grease tables upgraded to improve recovery efficiency and minimize recirculation;
- Small diamonds recovery plant de-commissioned; this plant was demolished in Q4 Fiscal Year (FY) 16 to be replaced by a Fines DMS circuit (see Section 17.3);
- De-grit screens reduced from 1.6 to 1.0 mm to simplify plant operation and maximize diamond recovery;
- Shutdown of the re-concentration circuit in DMS to improve the stability of the DMS circuit in general and increase the mechanical availability of the two modules;
- Installation of two additional thickeners;
- Upgrade of the mobile MMD 1000 to improve availability;
- Upgrade of the motors and gear box for MMD 1300 to improve OEE;
- Installation of multiple tramp metal magnet removal units throughout the plant;
- Installation of new CV18 conveyor and feed chute; this conveyor is the transition conveyor from the cold temperature reclaim building to the warmer processing plant area; conveyor was upgraded with wider belt design and increased horsepower drive motor to reduce spillage and chute blockages.

The current plant flow sheet uses conventional diamond process technology and consists of the following main process areas:

- Primary crushing: where the ore is fed to a dump pocket by truck or front end loader and crushed using a primary MMD 1300 mineral sizer—the run of mine ore is reduced to approximately -300 mm at this stage; an MMD 1000 is available to improve primary crushing OEE when the primary crusher is off line for routine maintenance;
- Secondary crushing: where a wet cone crusher reduces the primary crusher product to -75 mm;

- Tertiary crushing: where HPGRs liberate locked diamonds from the kimberlite ore, in the size range of -75 +1.0 mm, and from recirculated -28 +10 mm material from the DMS float circuits;
- Primary and secondary scrubbing, followed by screening: where crushed ore is wet-scrubbed and screened to produce clean and suitably-sized material for further size reduction (-75 +1.0 mm), and concentrated by DMS treatment (-28 +1.0 mm);
- Primary and secondary de-gritting: where unwanted fines (-1.0 mm) are separated from ore;
- Two parallel DMS modules: where washed and sized feed (-28 +1.0 mm) is separated by density into diamond-bearing concentrate and a tailings stream—the tailings consists of two streams: the -28 mm +10 mm stream is recirculated back to the HPGR for further crushing and diamond liberation, and the -10 mm +1.0 mm stream is discarded via the coarse tailings conveyor and trucked to a coarse tailings dump;
- Diamond recovery, where diamonds are extracted from DMS concentrates by a combination of sizing screens, wet and dry high intensity magnetic separation, X-ray sorting, grease tables, and hand sorting; the +1 mm tailings from the recovery section are recycled to the HPGR while the -1 mm tailings are routed to the primary scrubbing circuit;
- Fines and coarse rejects disposal: where the -0.5 mm slimes fraction is thickened and pumped to the fine tailings containment areas and the grits fraction (-1.0 +0.5 mm) is combined with the DMS tails (-10 +1.0 mm) and conveyed to a stockpile outside the plant before being loaded and trucked to a coarse tailings dump.

Ongoing throughput challenges are addressed regularly and include variation in ore feed characteristics from the various sources and weather transitional periods leading to material handling variations.

Managing the above challenges is carried out by a combination of feed blending, material handling techniques, and transfer point monitoring.

Routine quality control, in line with diamond value management (DVM) principles, is undertaken by laboratory staff to ensure maximum efficiencies.

17.3 Fines Dense Media Separation

A Fines DMS section is presently undergoing construction (for commissioning in early 2017). This section is designed on the basis of a conventional DMS layout and is for the recovery of diamonds in the -1.2 mm +0.65 mm size range from the discharge of the desanding screen (refer to Figure 17-1).

The design capacity is 120 dmt/h. Concentrate from this section will be treated over grease tables to further improve the diamond concentrate by weight before caustic fusion and acid treatment on site.

The design has taken into account that any downtime in the Fines DMS does not affect the OEE of the main treatment plant.

17.4 Energy, Water and Process Materials Requirements

Approximately 31 MW of primary power generating capacity is available from seven 4.4 MW Caterpillar diesel generator sets. The site typically operates five generating units in winter and four in summer. An additional four 0.75 MW auxiliary units are provided as standby capacity. Installed generating capacity is sufficient to operate the processing plant throughout the mine plan.

Process water is sourced from the reliable site water reclaim system. The raw water tank, which has a capacity is 1,800 m^3, is periodically refilled to keep it at a maximum level. Approximately 700 m^3 of water is reserved for firefighting emergencies.

Coagulant and flocculent is added to the processed slurry (-0.5 mm) for settlement of the solids in thickeners before pumping to the fines tailings disposal facilities. Clear overflow water from the thickeners is reused as process water.

17.5 Considerations Relating to Ore Sources in Development

17.5.1 Sable

Processing of Sable ore will begin as the current Mineral Reserves are being depleted. During the ramp up period there will be an opportunity to blend material from Sable with several other feed sources (i.e., Pigeon, Misery, and Koala). Following depletion from other sources, it is assumed Sable ore will be blended with Jay RVK and mixed RVK/VK ore. Blending of Sable and Jay kimberlite into the process plant feed should mitigate the risks associated with a Jay-only plant feed.

17.5.2 Lynx

Processing of Lynx ore will commence under the proposed mine plan during 2017 (FY18). The Lynx pipe infill (see Section 7.3.8) is similar to Ekati pipes which have been processed with minimal issues (Koala and Koala North) and should not present unique processing challenges. A production trial (approximately four days of 100% Lynx feed) will be carried out after ore release is achieved in the Lynx pit during 2017.

17.5.3 Jay

Processing of Jay ore will commence while ore from current pipes (including Sable) is being depleted, requiring preparation for a return to single feed processing. The overall processing strategy for Jay ore will be to optimize the current processing plant circuit for 100% Jay-only feed.

Metallurgical test work on Jay core samples has been undertaken, with further test work to be undertaken in future.

A currently-known difficulty of handling of the Jay ore is the relatively high content of sticky, competent clays. A study is scheduled to commence in 2017 for the material handling of the clay-rich material at the receiving area of the plant. It is expected that during the ramp-up of Jay ore processing, there will be other Mineral Reserves available for blending to lower the risk of treating the high clay content of Jay-only feed in the first several years of production.

The Jay pipe is emplaced in a combination of two mica granite, metasediments, and diabase, collectively referred to as "wall rock." In general, excessive dilution by pit wall rock is mitigated by controlled blasting practices and by pre-sorting in the open pit or stockpile area. A production geologist controls accidental dilution (e.g., mucking beyond the contact) and xenolithic waste rock dilution through inefficient small equipment sorting at the ore feed stockpiles. Drilling results to date provide no indication of large internal waste blocks.

The high compressive strength of the waste granite and metasediments can cause processing upsets. This material is limited to 5% of overall plant feed in general operating practice, although intermittently, plant feed containing up to 20% granite has been encountered. High granite feed increases the wear rate on equipment, which can result in decreased overall plant utilization and increased costs.

The metasediment and two mica content of Jay wall-rock dilution is expected to be similar to that found in the Misery pushback pit.

Future process studies (specific to the Jay pipe) to improve diamond recovery efficiencies and ore throughput rates include:

- Densimetric analysis of DMS concentrates and tailings;

- Magnetic susceptibility of concentrate material to determine potential further reduction in concentrate volumes;
- Splitting the current DMS modules into a coarse and fines stream in line with DVM best practices;
- Front end modifications to handle high clay content material, and additional studies;
- X-ray transmission technology to add additional DMS capacity and thus overall throughput.

17.6 Comments on Recovery Methods

The responsible QPs are of the opinion that:

- There are 18 years of production history that allow for a reasonable assessment of plant performance in a production setting. There are no data or assumptions in the Mineral Reserves Base Case Mine Plan that are significantly different from previous plant operating experience, previous production throughputs and recoveries, or the Ekati Project background history;
- The current process facilities are appropriate to the kimberlite types that will be mined from the various domains outlined in the Mineral Resource and Mineral Reserve block models;
- The flowsheet, equipment and infrastructure are appropriate to support the mine plans;
- As there are a number of kimberlite sources being treated, the plant will produce variations in recovery due to changes in kimberlite type and domains being processed. These variations are expected to trend to the forecast recovery value for quarterly or longer reporting periods;
- Granite, clay, and tramp metal content of material sent to the plant requires monitoring, and a blending strategy is typically used;
- Processing of the Jay kimberlite will require minor modifications to the process plant. Due to the expected high clay content in the upper portion of the Jay kimberlite pipe, combined with limited blending options available during the initial processing stages for Jay, plant upgrades are being considered to better handle the sticky material and the expected reduction in overall process utilization;
- Reagent consumptions and process conditions are based on both test work and production data. The operating costs associated with these factors in the Mineral Reserves mine plan is considered appropriate given the nature of the kimberlites to be processed;

- There are sufficient processed kimberlite storage options available to support the mine plans.

18.0 PROJECT INFRASTRUCTURE

18.1 Road and Logistics

18.1.1 Tibbitt to Contwoyto Winter Road

The Ekati Mine site is located 310 km north east of Yellowknife and is accessible by land only via a winter ice road that is open typically for 8–10 weeks each year from mid-January to the end of March. The winter road is constructed each year as a joint venture between the Ekati, Diavik, and Gahcho Kué mines. The road is shared by other industrial users (i.e., exploration companies), and is open to the public and provides access for hunters and tourists.

Each mine shares the cost of construction, maintenance, operation and closure of the annual winter road. The length of winter road to the Ekati site is 475 km.

Fuel, large equipment and heavy consumables are freighted to site on the winter road. Ekati freight varies between 1,800 and 4,000 trucks per year. Critical to achieving the mine plans are the logistics of planning and expediting the delivery of freight required for a full year of operation over the winter road in a period of approximately two months. The road is capable of accommodating high levels of traffic. During peak usage years, over 10,000 truckloads per year were safely transported to the mine sites (Joint Venture, 2013).

Three seasonal maintenance/staging camps are located along the road. The most northerly is the Lac de Gras camp, which is located on the southeastern shore of Lac de Gras.

No modifications or refurbishments are expected to be required during development and operation of the Sable and Jay pits.

18.1.2 Air Transport

Ekati has an all-weather gravel airstrip that is 1,950 m long with an aircraft control building. The airport is equipped with runway lighting and approach system, navigational aids, radio transmitters and weather observation equipment.

Hercules C140 or combi-configuration passenger/freight aircrafts are used to transport fresh produce, light freight, and equipment to site. General freight is flown to the site year-round, with about four to five 727 freight jets per week visiting site. On a quarterly basis, Hercules C140 aircraft are used to ferry oversize supplies.

Passengers, both employees and contractors, are transported to the mine on charter flights.

The existing airstrip and airport will continue to be used for transport of site personnel, including temporary construction staff required for Jay and Sable project construction. Flight timing and frequency will be adjusted as necessary to accommodate larger numbers of personnel working on site.

18.1.3 Haul Roads

Transportation of material from the Misery kimberlite to either the waste rock stockpile or the Ekati process plant is via already-established mine roads.

Transportation of material from the Jay and Lynx kimberlites will use the existing Misery haul road. An extension to the haul road will be constructed from the Misery pit to the Jay site. The following site roads will be constructed:

- A road from the Misery Road to the south abutment of Jay Dike (Jay road), which will be approximately 5.1 km long;
- A road from the Jay road to the north abutment of the Jay Dike and Jay WRSA (Jay north road), which will be approximately 3.2 km long;
- A road from the Jay road to the Misery camp, which will branch off from the Jay road just north of King Pond (Jay pipeline road) and will be approximately 1.9 km long.

The traffic volumes on the Misery and Jay roads associated with hauling kimberlite between the Jay pit and the processing plant will vary depending on the mining and processing schedule in each year. As is currently the case for the transport of Misery kimberlite to the processing plant, these trucks are different from the haul trucks used in the open pit itself. As many as 10 CAT 793 haul trucks will cycle between the proposed Jay pit and proposed Jay WRSA, as well as between the Jay pit and the proposed ore transfer pads at the Jay and Misery roads. Other traffic will include bulk explosive trucks, fuel trucks, crew transport vehicles, road maintenance equipment, garbage trucks, low-bed trucks to transport larger equipment, water trucks, emergency vehicles, and light vehicles.

Transport of kimberlite ore from the transfer pad at the Jay pit to the processing plant at Ekati will be accommodated with DPRTs, which have been selected based on cost studies as the lowest cost option for the hauls from Misery, Sable, Lynx, and Jay to the processing plant. The selected DPRTs consist of a Western Star truck with a powered trailer and two non-powered trailers, with a payload of 216 t. Two DPRTs are currently in operation. A peak of 10 units is expected to be required during years when ore is sourced only from Jay and/or Sable.

Approximately 4.4 km of the Sable haul road was constructed by BHP Billiton, the former Project owner. The remaining 17.9 km is currently under construction and is expected to be completed by September 2016. The road is being constructed to accommodate two-way traffic using Caterpillar 777G haul trucks and has a 21 m wide running surface.

The combined requirements of the Misery, Lynx, and Jay projects may necessitate an upgrade to the Misery Road to enhance the capability of the road to accommodate higher frequencies of road train, mining fleet, and service vehicle traffic. About seven meeting spots are planned along the road that would be widened to allow large equipment to meet and pass oncoming road trains efficiently. These meeting places would total approximately 2 km in length.

18.2 Infrastructure

The buildings and infrastructure facilities at Ekati include all buildings (mobile and permanent), pipelines, pump stations, electrical systems, quarry site, camp pads and laydowns, ore storage pads, roads, culverts and bridges, airstrip, helipad, and mobile equipment. Key infrastructure was shown on Figure 2-1.

18.2.1 Ekati Main

The principal facilities at Ekati include:

- Main accommodations complex: Consists of 763 sleeping accommodation rooms, dining, kitchen, and recreation areas, first aid station, emergency response / mine rescue stations and maintenance shops. A sewage treatment plant, water treatment facility and incinerator room adjoin the main accommodations building;
- Power plant;
- Process plant;
- Bulk sampling plant;
- Truckshop/offices/warehouse complex: This provides for heavy and light vehicle maintenance, heated warehouse storage, change rooms, an environmental laboratory and administration offices;
- Bulk lubrication facility: Situated adjacent to the truckshop and holds bulk lubricant and glycol.

Ancillary buildings located within the Ekati main camp area include:

- Ammonium nitrate (AN) storage facility: Has a capacity of 16,500 t;
- Emulsion plant;
- Waste management building: Wastes to be sent off site are prepared for transport at this building;
- Site maintenance shed and sprung facility: This is used for shipping and receiving, during winter road operations and for aircraft freight;
- Airport building: This is the control point for all Ekati flight operations including fixed wing and helicopter;
- Core logging facility: building with core logging area and work offices to support advanced exploration and mine operation geological activities;
- A new shop is planned for the Ekati Main camp area to service the DPRTs. A DPRT-specific shop will allow for the full length servicing, maintenance and washing of a coupled unit. A permanent tipping wall is also planned, providing the capacity to offload multiple, full-length DPRT units simultaneously.

18.2.2 Koala

Surface facilities to support the Koala underground operations include two maintenance shops, a warehouse, an office complex/change house, a compressor building and batch plant (for mixing concrete), a cold storage building, and a 1 ML fuel tank located within a bermed area.

18.2.3 Misery

The principal facilities at Misery include an accommodation complex consisting of single occupant rooms with a capacity of 115 persons, kitchen complex, recreation room and exercise gym, mine office and dry, mine maintenance shop and wash bay, generator farm and substation, fuel tank farm with off-loading and dispensing capabilities, and an incinerator with a waste-handling facility. Following completion of construction activities at Jay, and after the closure of the Misery pit, there will be a surplus of accommodations at the Misery camp, and the existing camp facilities may be decommissioned.

A redesign is planned for the main truck shop door to improve the efficiency of this facility. During the construction period, while operations are active in the Misery Pit, this facility will continue to be primarily dedicated to the Misery Pit mining fleet. During

Jay project operations, the existing Misery truck shop will become available for maintenance of support equipment.

18.2.4 Sable

No permanent structures are planned for the Sable site. Four heated ATCO trailer units will be used for mining operations and maintenance crews and will serve as a refuge station and base of field operations. The trailer units will be powered by a diesel generator set and equipped with emergency refuge supplies, potable water, and sewage holding tanks.

A fabric structure with two vehicle bays will be erected and used for heavy equipment maintenance.

18.2.5 Jay

The Ekati Main camp will continue to be used for the Jay and Sable projects for housing employees and contractors working at the main camp, as well as an overflow accommodation during peak periods of construction at the Jay and Misery sites. No upgrades are planned for the main camp area as part of the planned Jay and Sable operations.

During construction of the Jay project, personnel will reach a steady maximum of approximately 250. To accommodate these additional personnel, and to reduce travel time for daily shifts, a temporary 250-bed camp will be installed at the Misery site to supplement the existing facility. Any short-term peaks in the workforce above the capacity of the expanded facilities will be accommodated at the Ekati Main camp.

The existing truck shop at the Ekati Mine is capable of handling the CAT 793 trucks to be used in the Jay pit. However, the Ekati truck shop is approximately 30 km from the Jay pit. Once the Jay pit is in full production, the road to Ekati will be busy with road trains hauling ore to the processing plant, personnel buses, supply vehicles, and miscellaneous vehicles. The Misery road is also not wide enough to allow two-way traffic for the CAT 793 haul trucks. To support a large truck fleet remote from the main Ekati Mine site infrastructure, new maintenance facilities will be required at the Misery site. These facilities will consist of two fabric-covered structures approximately 24 m wide and 43 m long, each with two bays, providing a total of four new service bays.

The existing Ekati weld shop is not capable of supporting the demands of the larger size equipment fleet, especially during the peak of Jay construction. A secondary weld shop will be established at Misery to rebuild buckets and perform welding work on dozer tracks, truck boxes, and dozer blades.

18.3 Waste Storage Facilities

18.3.1 Existing Facilities

Waste rock storage areas are designed for placement of rock excavated from the open pits and underground mine, which is predominantly granite. Several different types of granites referred to as quartz diorite, granodiorite, two-mica granite and pegmatite have been identified in the region but for the purpose of waste rock management planning, these rock types can be classified as granite.

Waste rock storage areas also contain and store other materials including coarse kimberlite rejects (in the Panda/Koala/Beartooth waste rock storage area), low grade kimberlite stockpiles (in the Fox waste rock storage area), metasediments (in the Misery, Pigeon, and to a minor extent, the Panda/Koala/Beartooth waste rock storage areas; metasediments will also be contained in the Jay waste rock storage area), land-fill (Panda/Koala/Beartooth and Misery waste rock storage areas), and land-farm (Panda/Koala/Beartooth waste rock storage area).

Locations of the various waste rock storage areas for the majority of the mining operations were shown in Figure 2-1.

The waste rock storage areas are typically constructed by means of inset lifts approximately 10 to 20 m deep with natural rock face repose angles of approximately 35º. The lifts are offset in a manner such that the overall slope angle will be less than or equal to 25º. Waste rock storage area heights are generally planned to remain less than 50 m above the highest topographic point over which the waste rock storage area extends.

The waste rock storage areas are constructed based on the original approved plans which stated they would remain as permanent structures, frozen into permafrost, after mining was completed. The design of the waste rock storage areas has evolved to incorporate measures that enhance the natural process for freezing into permafrost.

18.3.2 Sable

In order to store the expected 103 dry Mt of waste material generated by mining Sable, two WRSAs, the West WRSA (approximately 73 ha) and the South WRSA (approximately 66 ha), were designed. A third WRSA has been historically included, known as the East WRSA, which was proposed to be located to the north of Sable pit and east of Ulu Lake. This facility will not be required, as the West and South WRSAs already have more than sufficient capacity for the estimated waste that will be produced.

The criteria in Table 18-1 formed the basis for design of the Sable WRSAs.

Table 18-1: Design Basis, Sable WRSAs

Item	Design
Ramp grade	8%
Road overall width	35 m
Maximum dump height	50 m
Distance from high water marks	100 m
Distance from pit walls	50 m
Angle of repose	35°
Dump lift heights	20 m with steps every lift to meet final wall angle
Final wall angle for rehabilitation	23°
Distance from explosive storage	350 m
Granite in-situ density	2.73 t/m^3
Sediment in-situ density	2.27 t/m^3
Granite swell factor	50%
Granite compaction factor	30%
Bulk density blasted waste	2.28 t/m^3

18.3.3 Jay

18.3.3.1. WRSA

Waste rock from the Jay pit will be stored in the Jay WRSA that will be sited on the west shore of Lac du Sauvage, adjacent to the pit. Approximately 6.5 Mt of overburden soils and 129.5 Mt of waste rock (granite, diabase and metasedimentary rocks) will require storage.

A portion (approximately 42%) of the metasedimentary waste rock from the Jay pit is expected to be PAG. All of the metasediment mined from the Jay pit will be managed as PAG material because, as with other open pits at the Ekati Mine, there is no practical means of separating the portion of metasediment that is PAG from the portion that is not. Metasediment from the Jay pit will be co-placed along with non-PAG granite and diabase waste rock to mitigate the acid generation potential of the PAG rock within the pile. Co-placing the PAG and non-PAG waste rock during deposition minimizes the potential for formation of zones of PAG rock with a greater susceptibility for acid generation. Co-placing the waste rock from the Jay pit on an “as-mined” basis during operations is possible because of the simultaneous production of both metasediment and granite, with a predominance of granite, throughout the mine life.

Jay WRSA design features include the following:

- Placement of a layer of non-PAG granite rock (nominally 2 m thick) over the tundra before construction of the WRSA to promote early aggradation of permafrost into the base of the WRSA and to prevent contact of potentially reactive waste rock with surface water flow over tundra soils, which can be naturally acidic;
- Co-placement of metasediment waste rock from the Jay pit with non-PAG granite and diabase waste rock to mitigate the acid generation potential of the PAG rock within the metasediments; encapsulation of potentially reactive materials (i.e., metasediment) within a thermally protective and geochemically non-reactive cover and outer zone so that the potentially reactive materials remain at freezing conditions, thereby promoting stable storage over time;
- Construction of WRSAs with setbacks from receiving waterbodies as a mitigation measure to allow for attenuation of drainage by tundra soils and to allow space for contingency measures, if required.

The maximum height of the Jay WRSA over the average tundra elevation will be approximately 65 m and the footprint area will be 219 ha. The WRSA footprint is constrained by several setbacks: a minimum 100 m setback is maintained from Lac du Sauvage, a minimum of 30 m is maintained from other smaller waterbodies and streams, and a minimum of 200 m is maintained from the adjacent esker. These setbacks result in a requirement for a slightly higher overall height of the pile. The geometry of the Jay WRSA includes overall side slopes of approximately 3 to 3.5H:1V. These outer slopes will be constructed with 15 m high benches with angle of repose (approximately 37°) slopes and 35 m setbacks.

The proposed layout for the Jay WRSA to crest elevation 500 masl provides a total storage volume capacity of 91.4 million m^3. This capacity provides storage for the Jay pit waste rock and overburden volume of 79.3 million m^3, 0.5 million m^3 for overburden soils from Jay Dike construction, and an additional 11.6 million m^3 for contingency storage.

18.3.3.2. Lynx Pit Waste Rock

Granite rock in the order of 6.9 Mm^3 (either blasted run of mine rockfill or crushed and screened to various engineering specifications) is required for construction of roads, pads, and dikes for the Jay project. The granite rock for road, pad, and dike construction will be obtained from Lynx pit mining. As a contingency, a quarry could be developed within the footprint of the Jay WRSA as an additional source of run of mine granite rockfill for dike construction, if required.

Additional sources of granular material are not expected to be needed to support the Project. As is the current practice at the Ekati Mine, granite from sources of mine rock, including the Jay pit and the Beartooth WRSA or other WRSAs, would be available for use at the main camp and for the Jay project during operations.

18.4 Processed Kimberlite Storage Facilities

The Long Lake Containment Facility is used for the containment of fine processed kimberlite (refer to Figure 2-1). Crushed and washed kimberlite generated during processing is separated at the process plant and the fine fraction is sent to the Long Lake Containment Facility by slurry pipeline. Components at the Long Lake Containment Facility include five containment cells, three filter dikes, the outlet dam, access roads and pipelines. The accessible storage capacity of three of the containment cells was mostly utilised by the end of 2014. Additional capacity will be provided by a combination of extension of two of these cells, and by raising one of the dikes. The fourth licensed deposition area is not currently planned to be used except as contingency or for future developments.

Mine water discharged into the containment facilities is expected to fluctuate seasonally with large volumes being pumped during the spring freshet. Additionally, after a significant rain event, large volumes of water collected in the camp sumps need to be pumped out. After freeze-up there is a reduction in the volumes pumped, with the main contributors being the indoor sumps.

In addition to the containment facilities, the mined-out Beartooth pit has been used since late 2012 for kimberlite fines containment, with material also sent to the pit via slurry pipeline from the process plant. The containment cell expansions and Beartooth pit will provide capacity to 2019 with the mined-out Panda, Koala and Fox pits available to provide additional capacity beyond that date.

Fine processed kimberlite from the Jay and Sable pits will be deposited in the mined-out Koala and Panda open pits and associated underground workings. The fine processed kimberlite slurry from the processing plant will be transported via slurry pipelines, as is current practice at the Ekati Mine.

Coarse processed kimberlite could either be stored in the existing WRSAs adjacent to the processing plant or co-deposited in the mined-out Koala and Panda open pits. Due to the low value of the coarse processed kimberlite relative to the existing stockpiles, the increasing haul distances of WRSA deposition as the coarse stockpiles grow in size, and the reclamation benefits of in-pit deposition and co-deposition of fine and coarse processed kimberlite is the recommended alternative.

18.5 Stockpiles

Temporary kimberlite stockpile areas will be required during the operations of the Jay project:

- A stockpile will be developed at a new ore transfer area west of the south abutment of the Jay Dike close to the Jay pit;
- A stockpile will be developed on the existing crusher pad area near Misery WRSA located at the junction of the existing Misery road and the proposed Jay road after crusher activities for dike construction are completed.

Due to the greater distance from the Sable pit to the process plant, ore will be stockpiled in the vicinity of Sable pit. Stockpiled ore will be transported to the process plant using a long-haul truck fleet.

The existing stockpile area at the processing plant will continue to be utilized for Jay and Sable ores.

18.6 Aggregate Crusher

A new laydown area for a 600 t/h aggregate crusher is under construction close to Misery camp, at the junction between the Misery and Jay roads. The crusher will process waste granite from Lynx pit as feedstock and will produce the fine and coarse filter materials to construct the Jay project, as well as road crush materials (50 mm minus and 150 mm minus) for roads and laydown areas, and concrete aggregates for concrete catch pads in the new Misery truck shop.

18.7 Water Management

18.7.1 Ekati Main

Three primary diversions have been constructed at Ekati: the Bearclaw Lake dam and pipeline, Panda diversion dam and channel, and Pigeon stream diversion.

The Bearclaw (frozen-core) dam is required to divert water around the Beartooth pit for the duration of operational use of the Beartooth pit. Flow is diverted using a pump/pipeline which diverts surface drainage from Bearclaw Lake around the Beartooth pit and into Upper Panda Lake.

The Panda diversion (frozen-core) dam and channel was completed in 1997 to divert water from North Panda Lake around the Panda and Koala mining areas and into Kodiak Lake. The Panda diversion channel provides stream fish habitat to compensate for loss of streams that used to connect Panda, Koala and Kodiak lakes as well as other streams in the Ekati footprint. The Panda diversion dam and channel are designed and required by the authorizations to be permanent structures.

The Pigeon stream diversion diverts surface flow around the area of the proposed Pigeon open pit. In 2013, the channel had been constructed but flow had not been diverted, allowing for the controlled flushing of sediment from placed construction materials. In 2014, the Pigeon stream diversion was connected and flow was diverted. The Pigeon stream diversion is designed to provide stream fish habitat to compensate for loss of streams that used to connect Pigeon Stream and Pigeon Pond. The Pigeon stream diversion is designed and required by the authorization to be a permanent structure.

The objective for the wastewater management systems is to discharge water to the receiving environment that meets the water licence discharge criteria and to ensure no significant adverse environmental effect occurs to the downstream receiving environment.

Surface mine water (run-off over mine areas that is collected in various sumps) is pumped or trucked to the Long Lake Containment Facility.

Open pit mine water is collected via the in-pit dewatering systems that are designed to maintain safe and reliable operations in active mining areas. At the mined-out Panda and Koala open pits no dewatering occurs because of safety risks to people working within the pit; clean surface runoff is diverted prior to entering these pits where feasible and other water enters the underground workings and is managed as underground mine water. Fox pit water, combined with the intercepted surface water is pumped into the Long Lake Containment Facility. Prior to 2009, water was pumped or trucked out of the Beartooth pit to the Long Lake Containment Facility. In 2009, the Beartooth pit ceased mining operations and water was no longer removed from the pit.

Water that enters the underground mining operations is managed through a series of sumps that ultimately direct the underground mine water to a single dewatering sump from where it is pumped to surface. Prior to December 2009, underground mine water was pumped to the Long Lake Containment Facility. Beginning in December 2009, underground mine water has been pumped to the mined-out Beartooth pit.

18.7.2 Misery

Misery pit water is pumped to the King Pond Settlement Facility.

18.7.3 Sable

Two Rock Dam is designed as a low-head, frozen core dam. It will be approximately 6.6 m high, 260 m long, and will impound up to 1.6 m of water. The dam will consist of a frozen core of nearly-saturated processed 20 mm rock fill. A geosynthetic clay liner, placed upstream and over the crest of the core, will provide seepage control if cracks develop in the core. Horizontal thermosyphons will be installed in the frozen core to ensure the core and permafrost foundation are sufficiently cold to act as an impervious seepage barrier and to limit long-term creep deformations of the dam embankment. The core will be surrounded by a transition zone of 200 mm processed rock fill. The dam shell will be constructed of run-of-mine granite. The dam will be constructed during the winter in a manner that ensures the core freezes as the dam is built.

The Two Rock Filter Dike is designed as a zoned rock fill dike of select and processed granular rock fill. The structural body of the semi-pervious dike will be a rock fill shell. The upstream slope of the rock fill shell will be overlain with 20 mm processed granular filter material placed on 200 mm processed transition material. A 200 mm transition cover will be placed on top of the filter to protect the filter against erosive wave action. This is similar in design to the filter dikes that have been constructed in the Long Lake Containment Facility and is therefore proven effective.

18.7.4 Jay

18.7.4.1. Jay and North Dikes

The Jay project design concept for a water-retaining dike (Jay Dike) is similar to the approach used at the Diavik Diamond Mine, including a semi-circular ring dike extending from shoreline, with a cross-section and construction technique similar to that used at the Meadowbank Mine.

The Jay Dike, in combination with the North Dike, is intended to isolate that portion of Lac du Sauvage that contains the Jay kimberlite. Once mining is completed, it is planned to back-flood the area during closure. Local breaching through the dike to re-establish the connection with Lac du Sauvage will be carried out once water quality is demonstrated to be acceptable.

The selected dike alignment of approximately 4.5 km will follow shallow water areas, and cross islands wherever possible. About 800 m of the dike length will be over island areas. The north abutment of the Jay Dike will be located on an island near the western shore of Lac du Sauvage. A channel approximately 40 m wide and 1 m deep exists between the island and the shore. Therefore, a small dike, the North Dike, will be constructed between the island and the shore to ensure hydraulic isolation.

The Jay Dike design includes the following general components:

- A broad rockfill shell;
- A central zone of crushed aggregates (fine and coarse filters);
- A composite low-permeability element.

The North Dike will consist of a rockfill shell, with granular fine and coarse filters, and an upstream bituminous geomembrane liner.

Five typical dike design sections were developed for the Jay Dike, consisting of single platform construction (Sections 1 through 3) and double platform construction (Sections 4 and 5). The dikes are designed to meet local regulations and the Canadian Dam Association's *Dam Safety Guidelines* (CDA 2013).

Geotechnical instrumentation will be installed within the dike structure and foundation to monitor the performance of the dike during dewatering and operation. The instrumentation will monitor the physical performance of the dike to confirm that the structure is operating according to the design intent. Monitoring will continue until the diked area is back-flooded as part of closure and reclamation.

Some seepage through the dikes is expected. This water will be collected and managed during operations. Depending on the location and magnitude of any seeps, there may be a requirement to construct local collection ditches and sumps. Weirs or other devices may be constructed to measure seepage flow and allow visual inspections to be conducted. Collected seepage is planned to be conveyed to the Jay runoff sump.

Construction of the dike is planned to begin in summer 2018, and would continue until May 2021. Dewatering is anticipated to take about six months, commencing in May 2021. Pre-stripping activities would commence late in 2021, allowing first ore to be accessed early in 2022.

18.7.4.2. Diversion Channel

The proposed Sub-Basin B Diversion Channel will be constructed to divert inflow from two drainage areas to the west of Lac du Sauvage (Christine Lake and AC35 outflow). Surface runoff will be intercepted as it drains towards the dewatered area and diverted to the south of the Jay Dike south abutment into the main basin of Lac du Sauvage. The diversion channel will be approximately 1.4 km long, with a base width of between 2.0 m and 4.0 m.

A design flow with a 1-in-100-year return period, plus a minimum 0.3 m of freeboard, was used to design the diversion channel. This design is considered appropriate to mitigate the risk of pit flooding during extreme seasonal peaks. The design concept for the channel is that it will be lined with riprap underlain by a layer of non-woven geotextile. The channel design allows for fish passage.

18.7.4.3. Dewatering Strategy

The Jay pumping and pipeline system will include six pumping stations with three phases of pumping to effectively manage the water during both dewatering and operations. The pumping system will dewater the diked area over a span of about six months, after which the system will manage mine water inflows and mine area runoff water. Each pumping station will discharge to a pipeline.

For the initial dewatering stage of the project, water from the diked area of Lac du Sauvage that is sufficiently clear of sediment will be pumped directly into Lac du Sauvage.

During dewatering of the diked area, after total suspended solids (TSS) concentrations become too high for direct release to Lac du Sauvage, dewatering will be accomplished by pumping water to the mined-out Lynx pit and Misery pit. The Lynx and Misery pits would function as TSS settling facilities.

During mining, mine water (e.g., inflow to the Jay pit) and mine area runoff reporting to the dewatered area will be collected in two separate sumps within the diked area and pumped to the mined-out Misery pit. Mine water is expected to contain elevated concentrations of total dissolved solids, and will be pumped to the bottom of the Misery pit. Mine area runoff water will be pumped to the top of the Misery pit. After approximately 2029 (after eight years of mining operation), discharge will begin from the upper layer of the water stored in Misery pit to Lac du Sauvage through an outfall and diffuser.

A portion of the water stored in Misery pit during dewatering will be redirected to the Lynx pit for additional water storage and back-flooding for closure.

Two runoff sumps will be located in a natural depression within the diked area west of the Jay pit. The Jay runoff sump will collect surface minewater that drains toward the diked area. The Jay runoff sump will be sized to provide a contingency storage sufficient to store the runoff from the 1:10-year peak inflow event while pumping out at the maximum pump rate of 1,700 m^3/h. The volume is estimated to be approximately 460,000 m^3.

The mine inflow sump will be located in a natural depression near the crest of the Jay pit. This sump will collect mine inflow (groundwater inflows to the pit and direct precipitation) and is sized to provide a contingency storage sufficient to store three days of open-pit mine water, dewatering at the maximum pumping rate of 1,000 m^3/h, throughout the entire operations phase. The storage contingency is estimated to be approximately 72,000 m^3.

18.7.5 Sewage

There are two main sources of sewage: sanitary sewage system at the main site and sewage from remote work sites (e.g. Fox pit and Misery site).

An enclosed sanitary sewage treatment plant to treat all domestic wastewater has both primary and secondary levels of treatment. The final treated effluent is pumped to the process plant where it is mixed with the fine processed kimberlite before being discharged to various cells of the Long Lake Containment Facility.

Sewage collected from the underground operations surface buildings and from the underground workings is trucked to the main camp sewage treatment facility. Sewage generated at remote washroom facilities (e.g. Fox pit and Misery site) is trucked to the main camp sewage treatment facility.

18.8 Power and Electrical

18.8.1 Ekati Main

The main power plant at the Ekati Mine consists of seven 4.4 MW diesel generator sets operating at 4,160 V. It provides power to the process operations, accommodations and truckshop/office complex. Waste heat from the power plant diesel engines is recovered by means of glycol heat exchangers to heat buildings and process water. The average load is approximately 16 to 17 MW with daily and seasonal fluctuations.

18.8.2 Misery

The Misery operation currently utilizes three 455 kW stand-alone diesel generators connected to a common synchronized power distribution system. The power distribution systems utilize the infrastructure remaining from the previous Misery operation. Site power cabling is located underground and terminated at the respective buildings. The site power distribution system has two distribution centers, the synchronized power distribution centre and a second power distribution system located at the accommodations complex.

A new 69 kv transmission line is under construction from the Ekati Camp to the Misery Camp. The construction is nearing completion as of end July 2016, and the line is scheduled to be energized in September 2016. From that point onward, Misery infrastructure power requirements will no longer require the stand-alone diesel generators.

18.8.3 Sable

Power will be supplied to the Sable site by a diesel generator with 600 V distribution systems. Electrical services will be provided to the office complex, wash bay, and fuel farm.

During the construction phase, power will be supplied by an auxiliary generator to the electrical submersible pump for the initial dewatering of the Sable pit.

18.8.4 Jay

A new 69kV transmission line is under construction from the Ekati Camp to the Misery Camp. The Jay project will tap into this line at two points to power the construction and mining activities for the life of the project. The first connection point will be located at the intersection of the Jay road with the Misery Road. This line will run along the Jay road to provide power for the dewatering of the Jay Dike as well as the mining operations.

The second tap line is located at Pole 255 at the intersection of the Misery road and the Lynx haul road. The Jay crusher will be powered from a new 69 kV substation that is tied into the Ekati to Misery powerline. The crusher is currently under construction and is scheduled to be powered on in mid-September 2016.

18.9 Fuel

To support the logistics of delivery of the fuel to site, Dominion leases a tank farm in Yellowknife with a capacity of 80 M litres.

Fuel storage on site has capacity of 98 ML. A central bulk fuel tank farm, which contains eight tanks and approximately 68 ML, is located at the Ekati Main camp. Other fuel tank farms are currently located at the Misery, Fox and Koala North sites.

Four 500,000 L fuel tanks will be used to store fuel for mining operations at the Sable site, which will equate to sufficient capacity for one month of operations. The bulk fuel tanks will be linked to the site diesel generators.

18.10 Water Supply

18.10.1 Ekati Main

Freshwater for Ekati operations is permitted to be drawn from Grizzly Lake, Little Lake, Thinner Lake (Misery Camp), and Two Rock Lake. The Long Lake Containment Facility and Two Rock Sedimentation Pond are makeup sources for process use as required.

18.10.2 Long Lake Containment Facility

Process plant fine processed kimberlite are deposited in the north section of the Long Lake Containment Facility while the raw water required for operations is taken in the south section, where the fine processed kimberlite have settled and clear water is available. The Long Lake Containment Facility is a closed-loop system.

18.10.3 Misery

The Misery project does not include any standalone site specific water treatment facilities; potable water is trucked from Ekati. It is expected that on average two trips per day will be required to maintain potable water levels at Misery when the camp is at maximum capacity of 115 people.

The accommodations complex is equipped with four waste water storage tanks, each with a capacity of 8,400 US gallons, located with the utilities services building adjacent to the accommodation complex.

18.10.4 Sable

Water from Falcon Lake and Two Rock Lake (which will be converted to a sedimentation pond) can be used as water sources for operations at Sable.

18.10.5 Jay

Additional water and wastewater storage are expected to be installed with the expanded construction camp at Misery. As with Misery operations, potable water will be trucked from Ekati.

18.11 Communications

Onsite communications are provided by microwave link from Yellowknife to the Ekati Mine, which is operated by a local telecommunications company, Northwestel. The microwave link has dedicated bandwidth to provide voice, data and internet services.

Also located at the Ekati Mine site is a backup satellite connection that has lower capacity than the main microwave link but can be utilised as required. Internal site communications are provided by radio, phone, LAN and wireless internet. A fleet management system, Wenco, is also utilised to track material movement and equipment status.

Communications at Misery are provided by an extension of the microwave link from the Ekati Main camp.

Communications infrastructure, including a new fibre-optic line, will be installed along the power transmission line alignment to enable data and voice communication services at the Jay site.

A second fibre-optic line will also be installed along the Sable haul road to provide data and voice communication services at the Sable site.

18.12 Comments on Infrastructure

In the opinion of the responsible QPs, the existing and planned infrastructure is appropriate to support the Mineral Reserves mine plan to 2034, and to support Mineral Resource and Mineral Reserve estimates.

19.0 MARKET STUDIES AND CONTRACTS

19.1 Reference Market

Rough diamonds are not homogenous, and are generally sold directly by producers with prices based on proprietary sorting and pricing systems that cover the range of size and quality characteristics for that particular producer.

Like most diamond mines, the Ekati Mine recovers a broad range of diamond sizes and qualities that need to be sorted into technical categories to be evaluated. Each technical category can be represented with a price per carat, collectively making up a price book. Each deposit at Ekati has its own unique mix of diamond categories, resulting in an overall average price per carat that acts as a basis for sales forecasts and financial analysis.

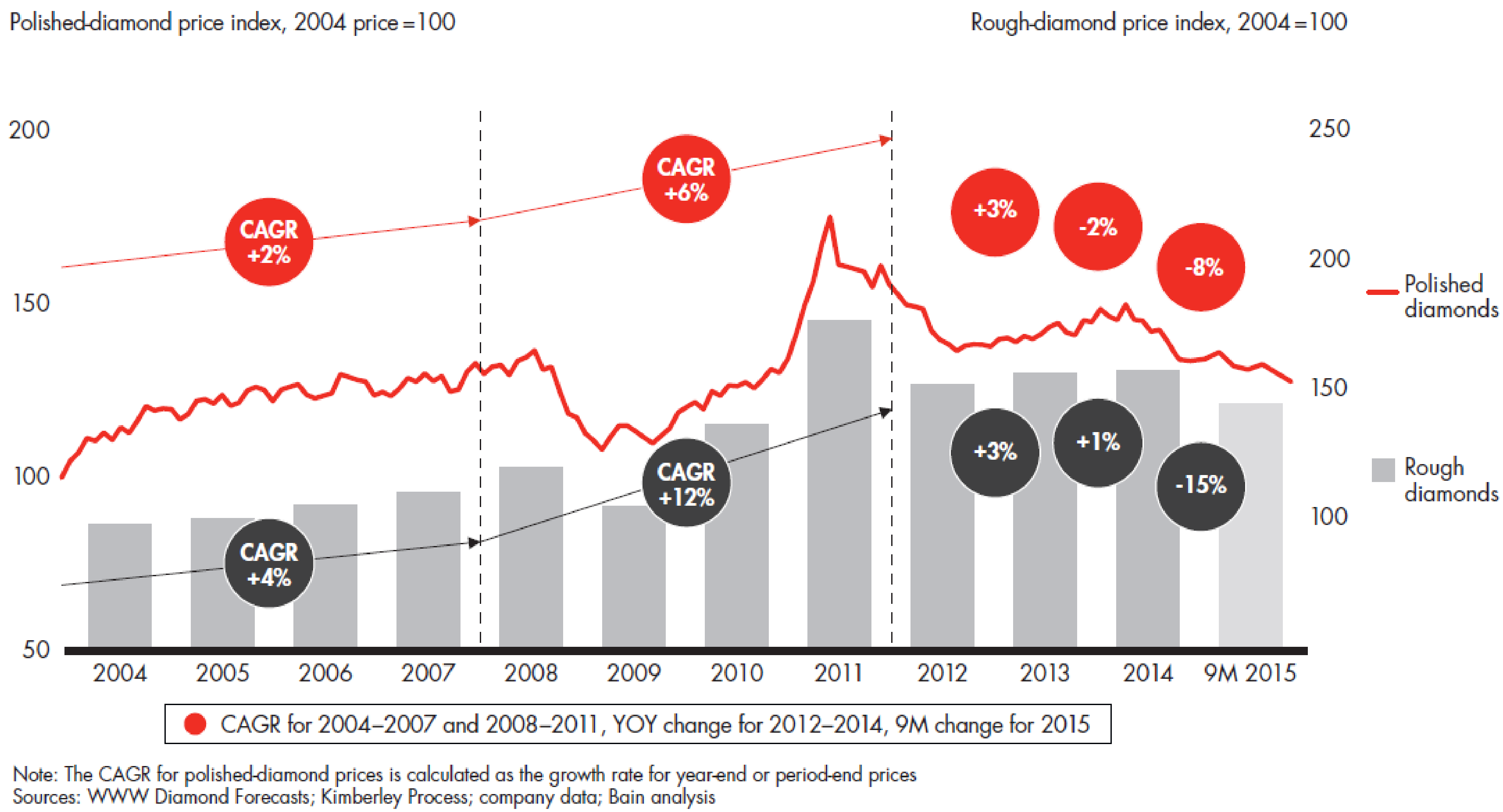
Dominion has a well-established sorting, pricing, and sales organization that has been in operation for over 11 years. Dominion has developed an assortment and price book that comprises over 12,000 sorted categories. Sorting of the full Ekati Mine production, as well as Dominion's share of the Diavik Diamond Mine production, is conducted in Dominion's Yellowknife, Toronto, and Mumbai, India, offices. Dominion aggregates similar categories into boxes that are sold 10 times a year through its wholly owned subsidiaries operating in Antwerp, Belgium, and Mumbai. The sales clients are generally larger diamond traders and polishers based in the major diamond cutting and polishing centre of India, along with some specific customers in the USA, Israel, and Belgium.

Rough diamond sales are conducted in US dollars on a cash basis. Dominion does not make any future price contracts, although it does offer to commit a regular supply of goods to established clients. To make sure that the prices achieved are a true reflection of the market, Dominion may auction a cross-section of the diamonds along with any "specials" (high quality, fancy coloured or large stones that are sold individually). The prices achieved at each sale are used to update Dominion's proprietary price book, which is then used to model the average price of each deposit to the latest market prices.

Although there is no industry-standard rough diamond price benchmark, various consulting groups and trade bodies, as well as other diamond mining companies, do publish prices achieved at sales and estimates of the overall market aggregate price changes. The prices achieved by Dominion, when adjusted for changes in quality of the diamond mined, closely match the published prices movements, an example of which is shown in Figure 19-1.

Given Dominion's expertise in marketing diamonds, it does not use third parties to value its goods, but relies entirely upon its own sorting and valuation methods for internal analysis, mine planning, and financial modelling.

Figure 19-1: Rough and Polished Diamond Price Index



Note: Figure from Bain & Company, 2015.

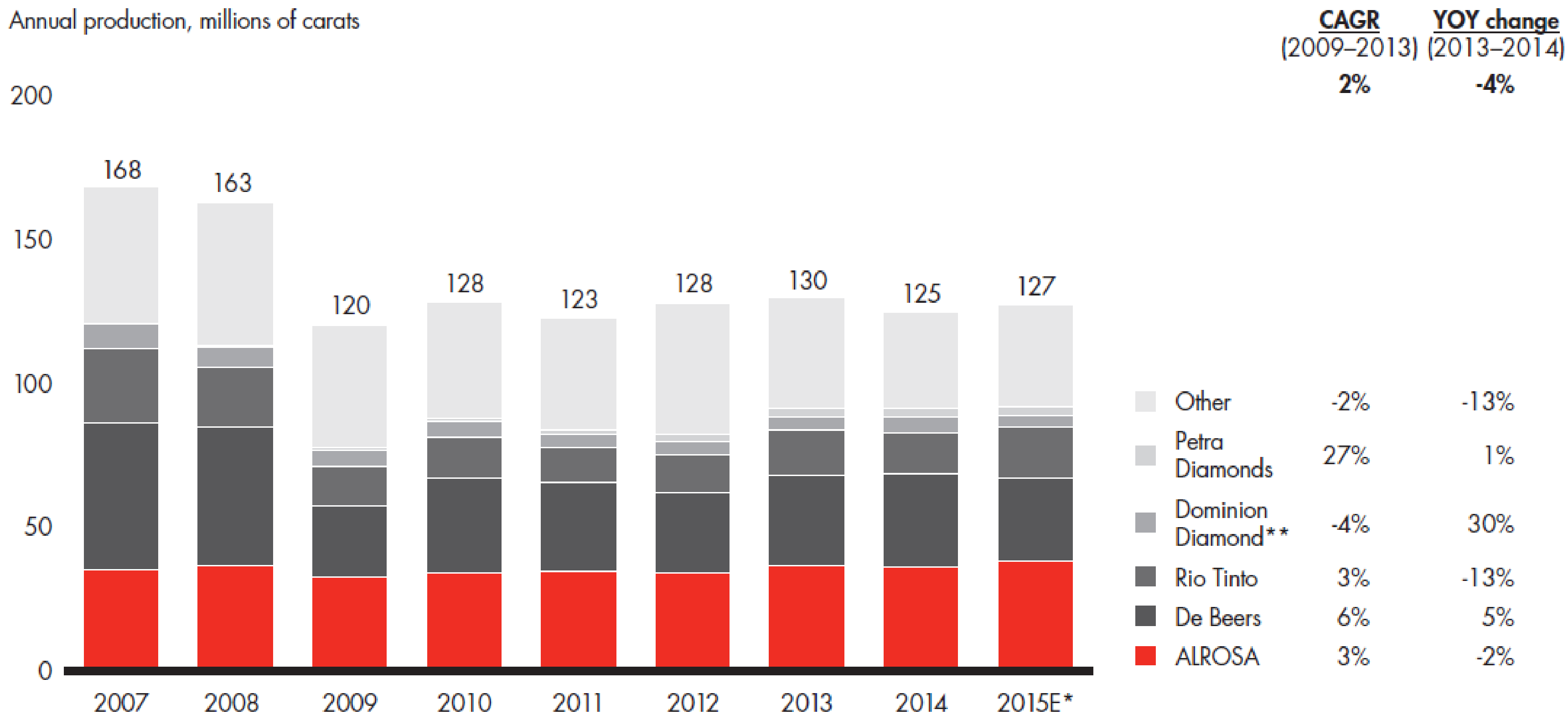
19.2 Market Fundamentals

The worldwide demand for rough diamonds is dependent upon the demand for polished diamonds that are used in jewellery. Only approximately 2% of the value of natural diamonds is used for industrial purposes and, although diamonds are treasured as a store of value, the formal investment market for diamonds is practically negligible when compared to other precious materials.

Historically, rough diamond prices have been relatively stable and the average annual increase has been a few percentage points greater than the growth in worldwide gross domestic product. The gem diamond market has been supply constrained, particularly in the last century while De Beers had a dominant position, and demand has been driven by successful marketing that has associated diamonds with emotional attachments. Diamond engagement rings have become a major component of jewellery sales and underpin demand even during economic downturns.

However, the turn of the century saw some fundamental changes in supply as De Beers' share of the rough market declined from a high of approximately 80% in the 1980s to approximately 40% in 2013 with the emergence of Alrosa, Rio Tinto, and Dominion as competitive sources of supply. In particular, De Beers sold down its strategic stockpile of diamonds in the years following its privatization in 2001, and so could no longer act as the "swing supplier." As a result, the rough diamond market is now purely driven by supply-demand with producers selling though production (Figure 19-2). This has resulted in some increase in price volatility, although this is still at low levels compared with other commodities, not least because there is no financial trading platform for diamonds.

Figure 19-2: Rough Diamond Supply



*Estimated based on company production plans
**Combined figures for BHP Billiton and Dominion Diamond in 2006–2012; fiscal year ends January 31; year 2006 represents fiscal year 2007, and so on
Notes: BHP Billiton sold its diamond business to Dominion Diamond in 2012; BHP Billiton's data converted from year ending in June to year ending in December, based on company reports for full year ending in June and reports for half year ending in December; only diamonds tracked by Kimberley Process are included
Sources: Company data; Kimberley Process; expert interviews; Bain analysis

Note: Figure from Bain & Company, 2015.

Diamond jewellery demand fluctuates, and is affected by numerous factors including worldwide economic trends, particularly in the major markets of the USA, Japan, China, and India. Diamond jewellery sales compete for discretionary consumer spending on luxury goods and, to a lesser degree, holidays and high-end electronics. Consumption of luxury goods in general is strongly linked to regional disposable incomes and size of an aspirational middle class, which in turn is linked to gross domestic product. Diamond demand has benefitted from the growth in worldwide gross domestic product and, particularly in recent years, the rapid development of the Indian and Chinese middle classes.

Although polished and rough diamond prices are intrinsically linked, there are a number of short-term factors that have a significant impact on rough prices, such as the Indian rupee exchange rates. A notable factor in recent years has been the tightening of liquidity by banks that has constrained manufacturers' ability to fund rough diamond purchases. As a result, dealers and manufacturers have reduced stock levels, and this has kept prices for new production subdued. Although these factors do result in rough diamond prices being more volatile than polished prices, they are generally short lived, and pricing inevitably reverts to a fundamental supply–demand balance over time (refer to Figure 19-2).

19.3 Long Term Price and Mining Limits

No forward market for rough diamonds exists to provide external long run pricing trends. The reasons for this are rooted in the lack of homogeneity in quality and absence of agreed standards for classifying and pricing the diamonds. Consequently, diamond price forecasts are dependent upon the fundamental views of future supply and demand.

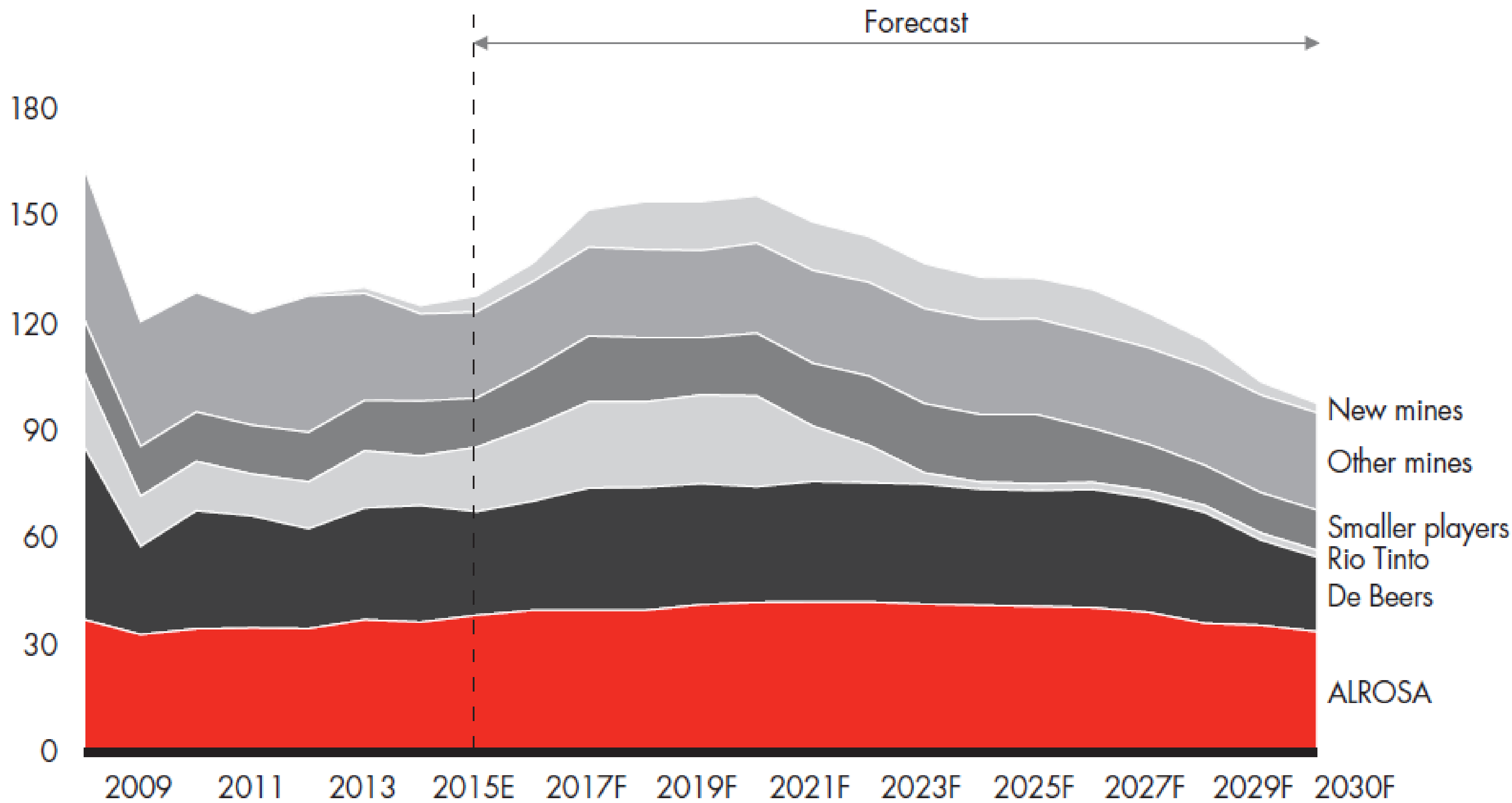
Various independent diamond market forecasts are produced by specialist companies, financial institutions, and respected major consulting groups, such as McKinsey & Company and Bain & Company. Dominion regularly reviews these reports together with its own market intelligence when formulating its own view of future diamonds prices.

As demand is dependent upon economic factors, market analysts generally consider a range of views about the health of the world's economy. Although there remains concern about Europe's economic recovery, political stability in Asian countries, and the slowing economic growth in China and India, the consensus view is generally a positive one.

Demand for diamonds is expected to continue to increase in nearly all economic scenarios, driven by strong fundamental economic factors including growth in disposable income and the continued emergence of a middle class in developing countries, as well as a robust US economy. There are some potential risks specific to diamond demand, including synthetic diamonds, impact of social awareness, and the growth of the recycled diamonds market, but most market analysts feel that all these issues can continue to be well managed by the industry.

Universally, all diamond market forecasts predict that supply will be constrained. Mid- to long-term production levels are well understood given that most of the major sources are already in production and new developments that are in the pipeline are well defined (Figure 19-3).

Figure 19-3: Rough Carat Production Forecast



Note: Smaller players are Dominion Diamond, BHP Billiton for 2008–2012, Petra Diamonds, Gem Diamonds and Catoca
Sources: Company data; Kimberley Process; expert interviews; Bain analysis

Note: Figure from Bain & Company, 2015. E = estimated; F = forecast.

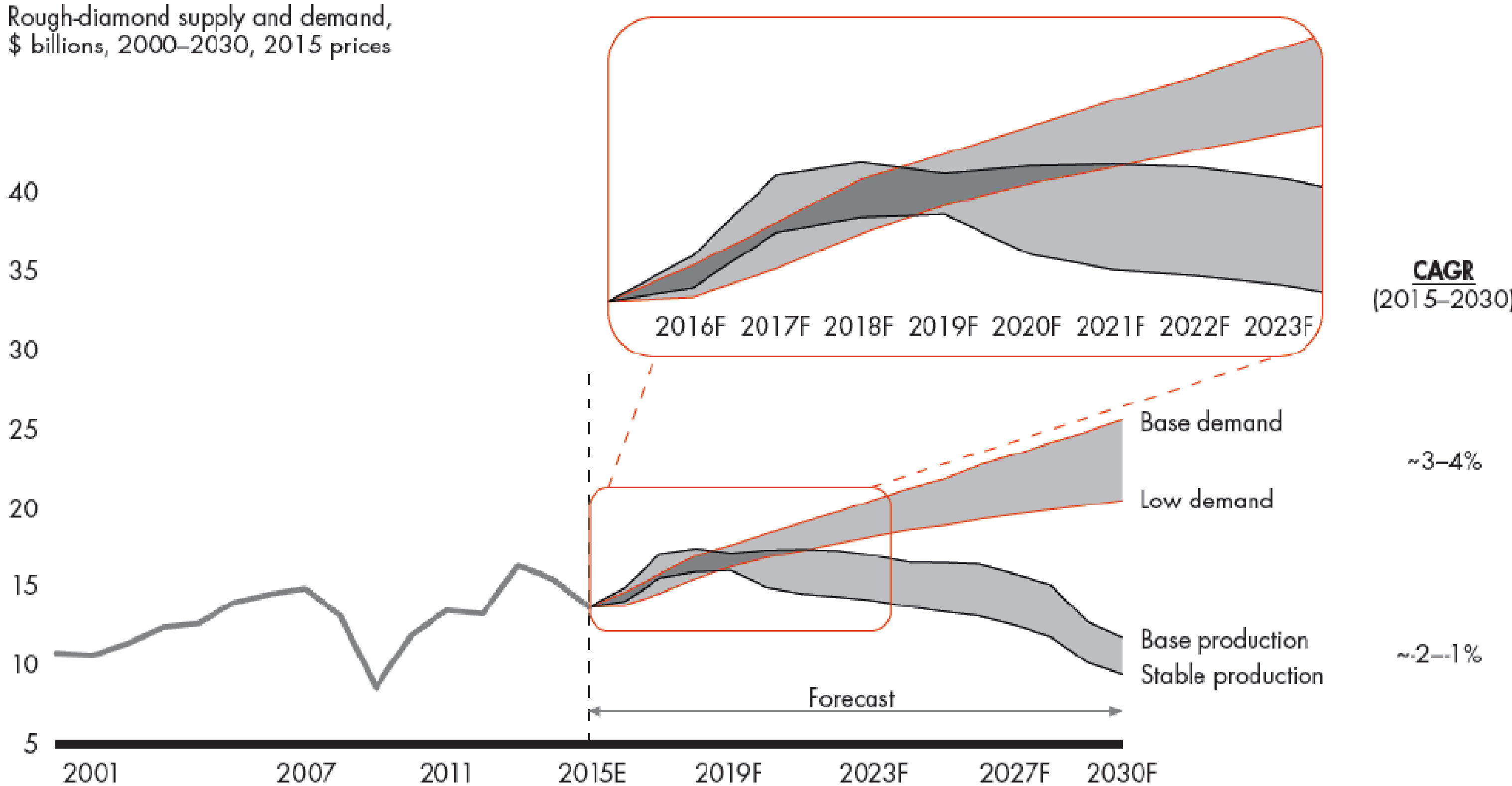
New finds generally take at least seven to 10 years to get to production and often much longer, although there have been some notable exceptions such as Marange in Zimbabwe. Other notable constraints on supply include the following factors.

- Mature mines are facing declining production and increasing costs with depth. Kimberlite deposits by their nature are typically vertical structures that taper with depth with a distinct ore/waste boundary that is defined by the lithology. Therefore, open pit mines face increasing cash costs as stripping ratios and haulage cycle times increase with depth and mining becomes more constrained. For those open pit mines of sufficient quality, the option to go underground involves significant capital investment, higher ore dilution, and even greater constraints on production rate;
- There exists no inventory of undeveloped Mineral Resources of sufficient scale and quality to offset ore depletion. This is the case despite significant investment in exploration over the past 25 years. The last discoveries of significance were Ekati and Diavik in 1991 and 1994, respectively;
- Greenfield and brownfield projects globally are facing increasingly onerous local beneficiation hurdles, as well as cost escalation.

Nearly all commentators have supply gradually rising for five years but at a lower rate than the growth in demand, resulting in modest growth in rough diamond prices. Although production peaks around 2019–2020 (but to a level still below pre-global crisis levels), demand is expected to continue to grow, resulting in a widening of the supply-demand gap that will likely lead to higher diamond price increases.

De Beers compared a McKinsey & Company production forecast (McKinsey & Company 2014; similar to Figure 19-3) with a smoothed demand scenario that reflects continued US recovery and above-average growth in India and China over the next 10 years. The comparison, based in nominal 2015 rough dollar prices, demonstrates the resulting widening disparity between supply and demand as shown in Figure 19-4. The implication is that rough diamond prices would have to increase at an average nominal rate of around 6.8% per annum to bridge the demand gap.

Figure 19-4: Production (Supply) versus Demand Forecast – 2015



Note: Figure from Bain & Company, 2015. E = estimated; F = forecast.

The most recent in-depth study of the diamonds industry (Bain & Company, 2015) makes the following conclusions for their base case forecasts:

- Global long-term rough diamond demand is expected to continue to grow at 3% to 4% per year from 2015 through 2030;
- China, India, and the USA will continue to drive diamond consumption and will account for the lion's share of new demand for diamond jewelry;
- The global supply volume of rough diamonds is expected to grow by a compound annual rate of 5% to 6% until 2019 and then decline by 3% to 4% from 2019 through 2030;
- From 2014 through 2018, the demand growth rate is expected to be exceeded by that of supply. Starting in 2019, demand will outpace supply. Demand is projected to continue its long-term growth trajectory, supported by the outlook for strong market and economic fundamentals, and supply is projected in line with the reduction in global production levels.

On the basis that the consensus view is of a healthy and continued demand growth against a long-term supply constraint, Dominion uses a base case rough diamond price rising at a long-term average rate of 2.5% per annum in real terms from 2017 for the whole life of the project.

19.4 Contracts

The Ekati Mine has a Socio-Economic Agreement with the Government of the Northwest Territories, along with Impact and Benefit Agreements with local aboriginal groups. Within these agreements, the Ekati Mine has committed to developing contracts with Northern and Aboriginal businesses, wherever commercially viable. Furthermore, the Ekati Mine is committed to supporting and developing sustainable businesses, and encourages local and Aboriginal business owners to examine opportunities to develop joint ventures with existing and established businesses.

Major contracts that the Ekati Mine currently has in place include:

- Aurora Ford – light vehicle maintenance;
- Dene Dyno Nobel – blasting material supply and services;
- Dene Tire North – tire supply and services;
- Deton' Cho Logistics/Nolinor – charter aircraft services for cargo;
- Deton' Cho Summit Aviation – charter aircraft services for cargo;

- Deton' Cho Summit Aviation – charter aircraft passenger services;
- Dream – office building lease;
- Finning Canada – mobile equipment supply and maintenance;
- First Air/Lynden – Heavy airlift cargo services;
- Kete Whii / Procon Joint Venture – underground mining labour;
- Kitnuna BradenBurry Expediting (KBX) – freight management and general consumable supply;
- Metshaw – Winter road shipment of reagents;
- Northcan Freighters – winter road fuel transportation services;
- Nuna Logistics Ltd. – civil construction works at Sable;
- SMS – Equipment and parts supply;
- Tli Cho Air / Air Tindi – charter aircraft for passenger and cargo services;
- Tli Cho Domco – catering and janitorial services;
- Tli Cho Landtran – winter road freight transportation services;
- Tli Cho Ventures West – fuel transportation services;
- Westcan – YK fuel tank farm lease.

The Ekati Mine emphasizes strategic sourcing, and typically enters into two to three-year terms for operational contracts, such as those listed above. Contractor employees make up an estimated half of the Ekati Mine workforce, and are well-integrated within the workplace culture.

19.5 Comments on Market Studies and Contracts

In the opinion of the responsible QPs:

- Dominion is currently able to market diamond production from the Ekati Mine;
- The pricing forecasts are based on assumptions provided by Dominion's marketing group and represent a best estimate, given there exists no forward market for rough diamonds to provide external long run pricing trends;
- The price forecasts are acceptable to support Mineral Resource and Mineral Reserve estimation, and use in the cash flow analysis;
- Existing contracts are typical of and consistent with standard industry practices.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Permitting

Ekati is predominantly regulated through an Environmental Agreement and permits with the following key agencies:

- Government of Northwest Territories (GNWT);
- Wek´èezhìi Land and Water Board;
- Fisheries and Oceans Canada (DFO).

20.1.1 Environmental Agreement

Ekati entered into an Environmental Agreement (January, 1997, amended April, 2003) with the Government of Canada (represented by Indigenous and Northern Affairs Canada (INAC)) and the GNWT which provides environmental obligations in addition to those under then applicable legislation;

Key provisions include:

- Funding of an independent environmental monitoring agency to serve as a public watchdog;
- Submission of environmental reports and management plans (including reclamation plans);
- Provide security deposits and guarantee.

The Environmental Agreement provides for the Independent Environmental Monitoring Agency and continues in effect until full and final reclamation of the Ekati Project site is completed.

Compliance with environmental requirements and agreements is reported publicly by Ekati on an annual basis.

20.1.2 Surface Leases and Land Use Permits

Dominion holds 10 surface leases issued subject to the Territorial Lands Act.

The Mackenzie Valley Resource Management Act came into effect after issuance of the six original surface leases and before issuance of the Pigeon, Sable and Lynx surface leases. Therefore, land use permits issued by the Wek´èezhìi Land and Water

Board were also required for the Pigeon, Sable and Lynx sites. Dominion has eight Type A land use permits (Sable haul road, Sable open pit and associated activities, Pigeon open pit and associated activities, Misery power line, Lynx open pit and associated activities, Lynx Waste Rock Storage Area, exploration activities, and the Jay Early Works and associated activities). The surface leases for the Misery site and road were amended in 2014 to explicitly allow for the construction and use of a power distribution line from the central Ekati Mine power-generating plant to the Misery site. The surface leases for the Pigeon to Sable Haul Road, Sable Pit, and the Pigeon Pit were renewed in May and July 2016.

Table 20-1 summarizes the surface lease information. Table 20-2 summarizes the Type A land use permit information. The locations of the surface leases are shown in Figure 20-1 and Figure 20-2.

Table 20-1: Surface Lease Summary Table

Surface Lease Number	Area (ha)	Infrastructure within Lease
76D/9-3-2	1,144	Misery open pit, facilities and road
76D/9-4-2	12	Misery Camp
76D/10-2-2	6,023	Koala, Panda and Fox open pits and facilities.
76D/10-3-2	3,701	Long Lake Containment Facility
76D/10-4-2	110	Airstrip and facilities
76D/15-4-2	998	Sable open pit and facilities
76D/10-5-2	155	Main Camp
76D/10-7-2	324	Pigeon open pit and facilities
76D/9-11-2	173	Lynx Pit
76D/9-10-2	186	Lynx Waste Rock Storage Area
Total	***12,826.6***	

Table 20-2: Land Use Permit Summary Table

Type A Land Use Permit #	Type A Land Use Permit #
W2016F0006	Sable haul road
W2016D0003	Mining and associated activities on Sable Lease
W2016D0005	Mining and associated activities on Pigeon Lease
W2013C0005	Exploration activities
W2013D0006	Lynx open pit
W2015D0005	Lynx Waste Rock Storage Area
W2014I0001	Misery power line
W2016F0007	Jay Early Works

Figure 20-1: Surface Lease Plan

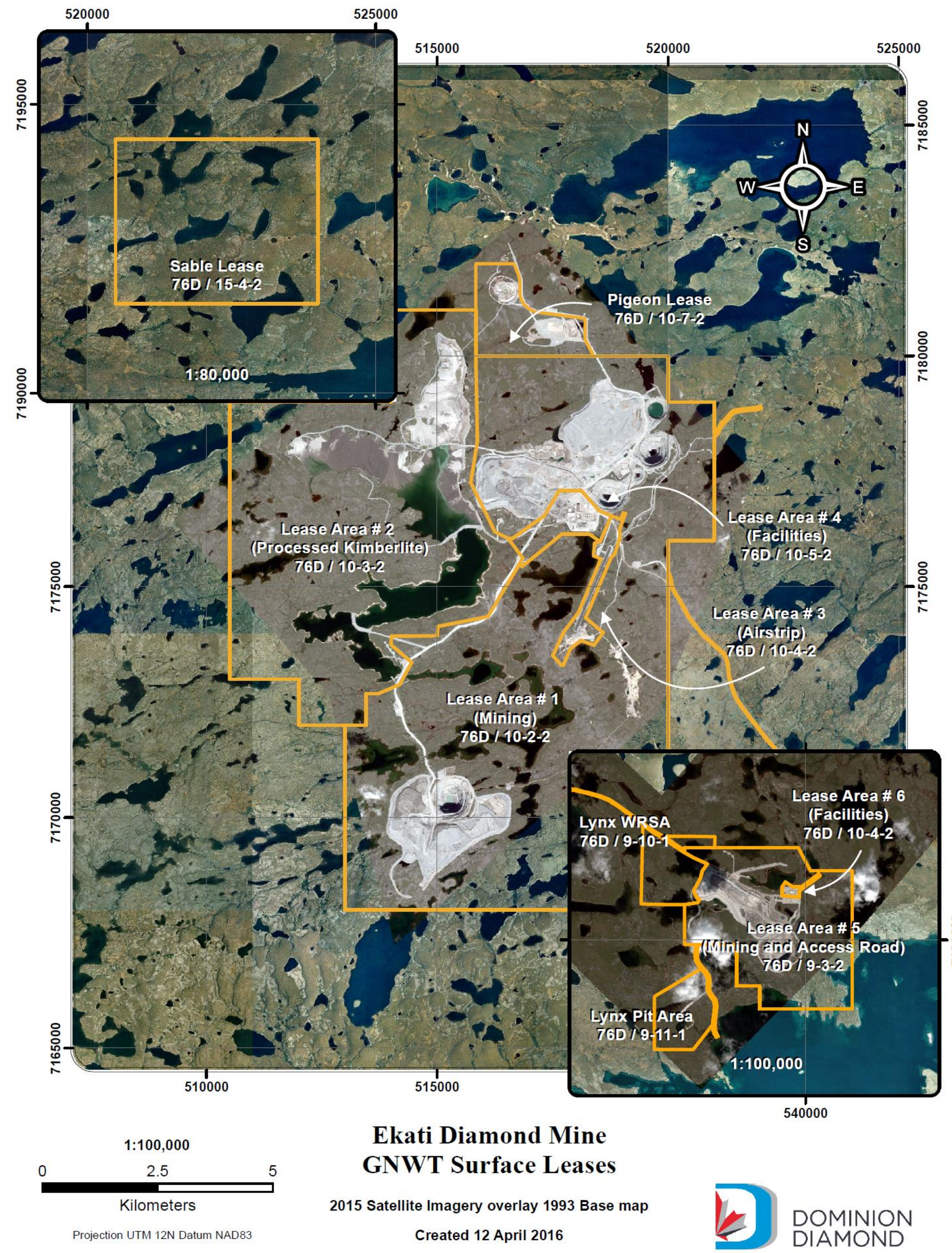
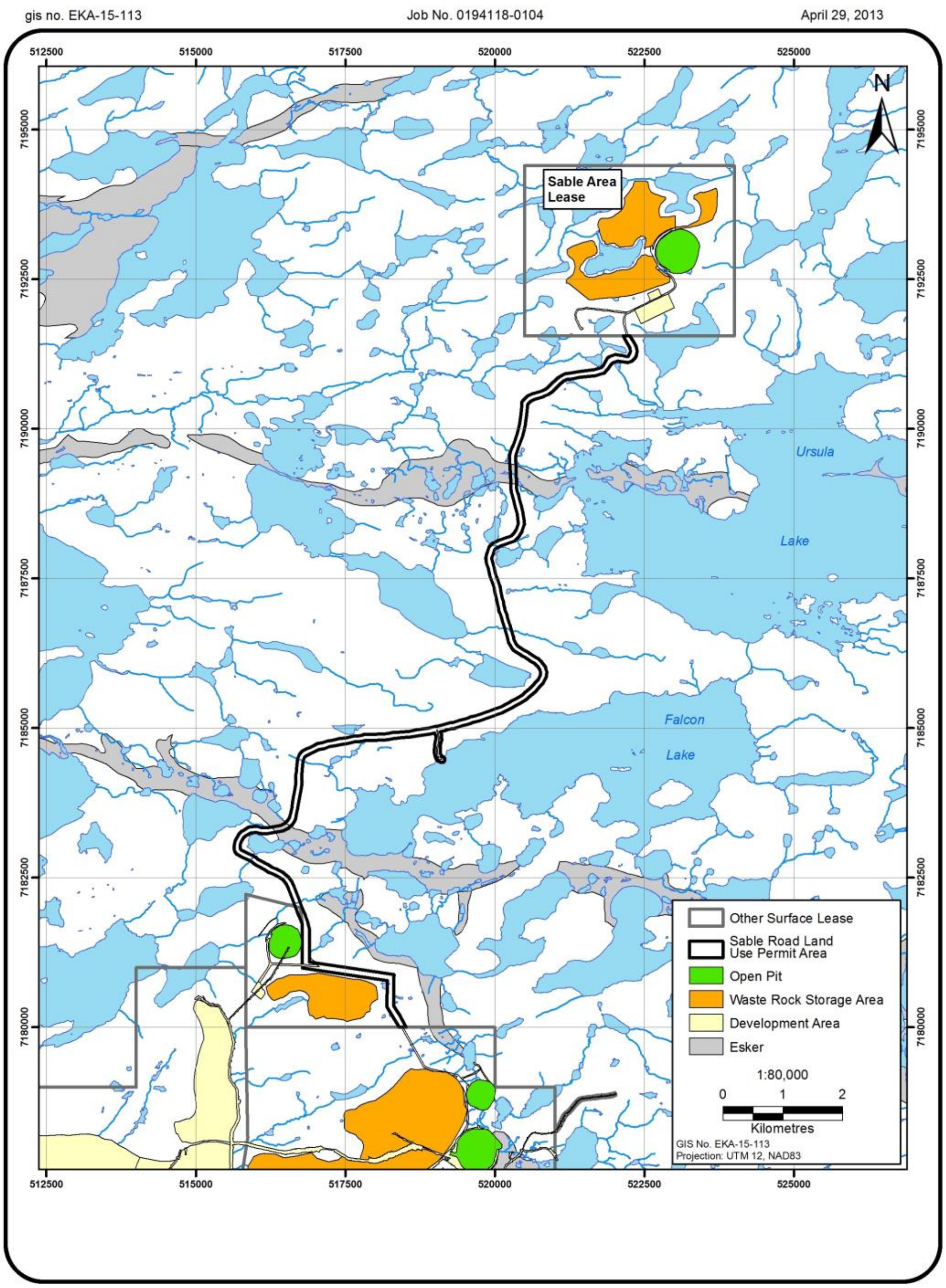


Figure 20-2: Sable Road Corridor Plan



Note: Figure courtesy Rescan, 2013.

The Pigeon surface lease was renewed in December 2012, and now also extends to 2026.

Section 10 of the Territorial Lands Regulations provides for the renewal of the surface leases for a further 30 year term with appropriate engagement with Aboriginal communities. The Sable surface lease was renewed in 2015 and now extends to 2026.

The Sable Pit Land Use Permit was renewed May 13, 2016 and is valid until May 12, 2021. The Pigeon and Sable Haul Road Land Use Permit and the Pigeon Pit Land Use Permit were renewed on July 19, 2016 and are valid until July 18, 2021.

20.1.2.1. Winter Road

Dominion is also a joint holder of three surface leases, one licence of occupation, and one Land Use Permit for the Tibbitt-to-Contwoyto winter road. These permits are jointly held with Diavik Diamond Mines Inc and DeBeers Canada Inc., and are managed by a Winter Road Joint Venture (i.e., not directly managed by Dominion).

20.1.2.2. Jay

In support of planned operations at the Jay pipe, a Type A land use permit will be required for the area around Lac du Sauvage that is outside the boundaries of the pre-*Mackenzie Valley Resource Management Act* surface leases. The land use permit would include extraction of waste rock and kimberlite, construction of a water diversion structure, construction of a site access road, and the other activities required for mining of the Jay pipe. As the surface leases that are in place for the existing operations at the Ekati Mine do not cover the Jay area, a new surface lease will also be required.

Dominion submitted an application to the Wek´èezhìi Land and Water Board in October 2013 for the Jay land use and surface use permits. The Jay proposal was referred by the Department of Aboriginal Affairs and Northern Development Canada to the Mackenzie Valley Environmental Impact Review Board for an environmental assessment in November 2013. On February 1, 2016 MVEIRB published the Jay Report of Environmental Assessment and recommended to the Minister of Lands the project be approved with 23 measures. The Minister of Lands then distributed the report to responsible ministers for consideration. Upon consideration, the ministers issued a decision on May 19, 2016 that the proposed development should proceed to permitting. Dominion has subsequently submitted applications to the Land and Water Board for an Early Works Land Use Permit, as well as a Type A Land Use Permit and an amendment to the Ekati mine Type A Water Licence (W2012L2-0001) to include the Jay project. The Jay Early Works Land Use Permit was granted on July 19, 2016. The Type A Land User Permit and the amendment to the Ekati Mine Type A Water Licence process are ongoing, with permit and licence grant expected in the summer of 2017.

20.1.3 Water Licence

Dominion currently holds one water licence (WL2012L2-0001), which was issued by the Wek´èezhìi Land and Water Board and went into effect on July 30, 2013. The licence will expire on August 18, 2021 but can be renewed. This licence provides for mining at all established areas plus allows for mining of the Pigeon, Lynx, and Sable pipes.

The water licence entitles Dominion to divert water from Upper Panda Lake to Kodiak Lake, and to use water and dispose of waste for the purpose of mining the Panda, Koala, Koala North, Misery, Lynx and Fox kimberlite pipes and for operating the processing facilities and infrastructure associated with diamond mining within the Koala, Misery, King–Cujo and Desperation–Carrie Watersheds of the Lac de Gras basin.

The water licence also entitles Dominion to use water; dewater Sable, Pigeon, Lynx, and Beartooth Lakes for the purpose of mining; to drawdown Two Rock Lake, divert the Pigeon Stream around the Pigeon pit; pipe water from the Bearclaw Lake outflow around Beartooth pit; use water from Ursula and Upper Exeter Lake; deposit processed kimberlite into the Beartooth pit for the purpose of creating a pit lake; and dispose of waste for industrial undertakings in diamond mining and processing, production and associated uses in the Koala, Pigeon and Sable watersheds.

For the planned Jay operation, an amendment to the existing water license will be required. The amended water license would authorize water use and waste deposition associated with the extraction of waste rock and kimberlite, construction of a water diversion structure, drawdown and fish-out of the main body of Lac du Sauvage, open pit and underground mining, placement of waste rock, reclamation, and other activities required for mining of the Jay pipe.

20.1.4 Fisheries Act Authorizations

Ekati has five fisheries authorizations (Section 35(2) authorizations for an undertaking or activity which results in serious harm to fish), which permit the mine to perform activities that result in serious harm to fish (or loss of habitat) under specified circumstances and include two compensation agreements:

- SCA96021 (with compensation agreement): covers all areas except Sable, Pigeon, Beartooth, and Misery;
- SCO1111: covers the Desperation and Carrie Ponds (Misery area);
- SC00028: covers King Pond (Misery area);
- SC99037: covers the Sable, Pigeon and Beartooth areas;
- 15-HCAA-00266 covers the Lynx Lake (with compensation agreement [referred to as offsetting in the 2013 Fisheries Act]).

A fish-out of Sable and Two-Rock Lakes was conducted over a two-year period starting in 2001. Phase 1 was conducted on Sable Lake between August 21 and 30, 2001, and completed from August 23 to 31, 2002. In Two-Rock Lake, the Phase 1 portion of the fish-out was conducted from August 19 to August 30, 2001 and completed from August 15 to September 8, 2002. A fish salvage will be completed on Sable and Two Rock Lakes in 2016. As a condition of this Sable fisheries authorization, all water crossings require habitat assessments, fish species investigations, and a hydrology assessment. This work occurred in summer 2015 and the Department of Fisheries and Oceans Canada (DFO) review was completed in early 2016 approving the water crossings design.

The proposed Jay operation will have effects on fish and fish habitat from construction of the dike in Lac du Sauvage, and from dewatering and fish-out within the diked area. An authorization under the *Fisheries Act* is required for these activities. Dominion will continue to work with the DFO on the details of the offsetting requirements for the Jay project. This authorization can reasonable be anticipated to be received prior to the planned commencement of fisheries work at Jay. Dominion is also pursuing the allowable Exemption from Navigable Waters Authorization for the area of Lac du Sauvage where the Jay pit and dike are located.

20.1.5 Navigable Waters Protection Act Authorizations

Ekati has two Navigable Waters Protection Act Authorizations for structures interfering with navigation (as defined by the Act):

- Ekati water works: bridges, crossings, dikes, intakes, disposal: expires 16 December 2021;
- Sable, Pigeon, Beartooth water works: intakes, dewatering, dams, jetty, diversions, habitat structure, processed kimberlite containment: expires 17 July 2027.

Dominion received an exemption from the Navigable Waters Authorization requirement for the Lynx pit.

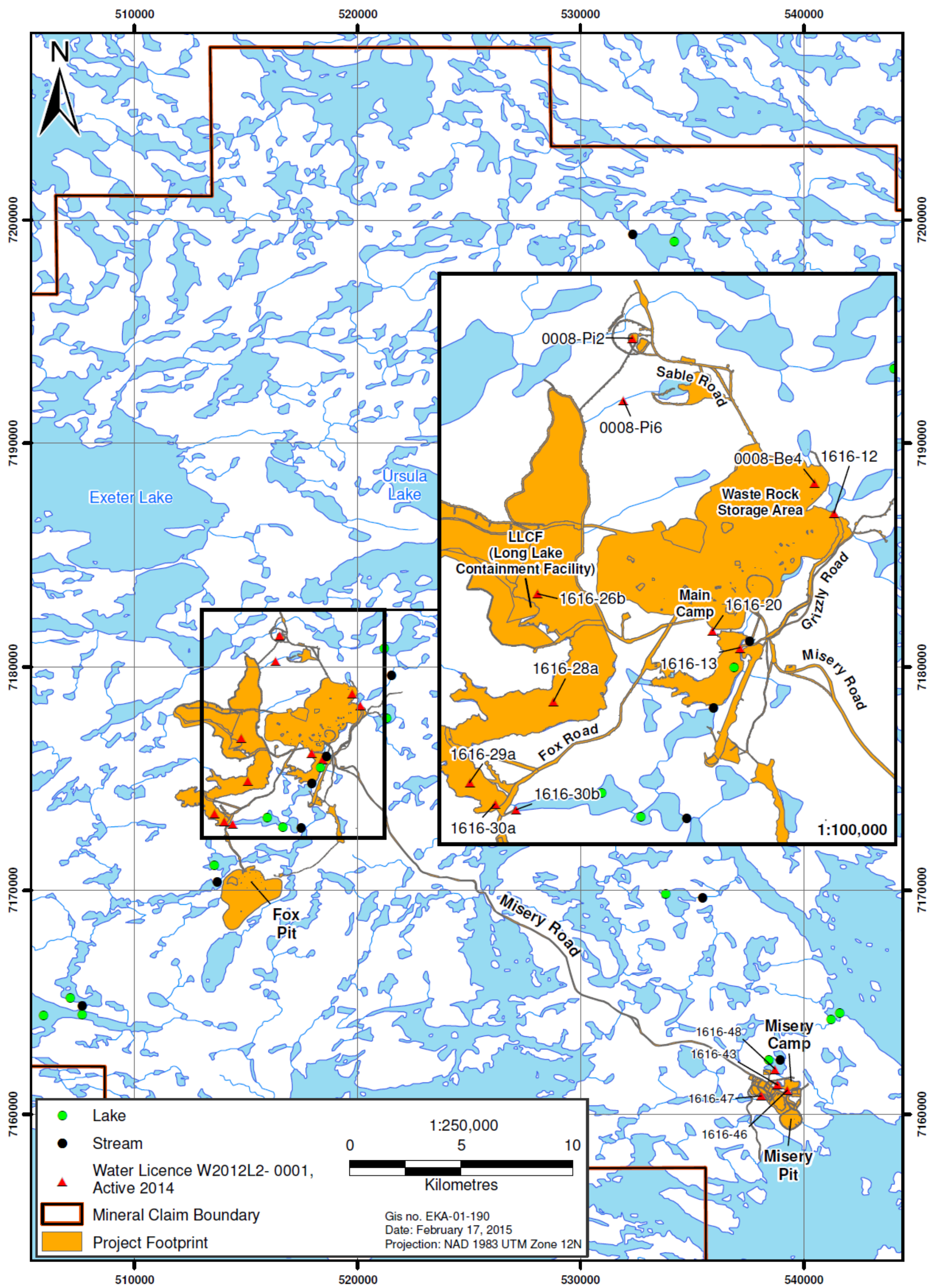
For the Jay project, Dominion will require, and will apply for, an exemption under Section 24 of the *Navigation Protection Act* that would enable dewatering within the isolated portion of Lac du Sauvage inside the dike. Dominion will, after opting-in under Section 4(1), apply for an Approval under Section 5(1) for other works, including dike construction in Lac du Sauvage.

20.2 Monitoring Activities and Studies

20.2.1 Water Quality

Water quality has been monitored continuously over the mine life at numerous monitoring points (Figure 20-3).

Figure 20-3: Water Monitoring Point Sites



Surface discharge from the Long Lake Containment Facility to Leslie Lake is a licensed discharge location.

Under the water licence, discharge criteria need to be met at the Long Lake Containment Facility discharge point (Koala watershed) and the compliance record is excellent.

Run-off from waste rock dumps occurs primarily during freshet and is less or absent at other times of the year. Runoff is primarily to ground and not directly to water bodies. Seepage water is sampled and tested at least twice per year for compliance and trends in water quality, with excellent compliance.

Water from the Misery Pit is pumped (when required) to the King Pond settling facility and then discharged to the environment once discharge criteria have been met.

Dominion has provided all required surveillance network program (SNP) data to the Wek´èezhìi Land and Water Board.

20.2.2 Aquatic Effects Monitoring Program

Aquatic effects are monitored annually, typically at 18 lakes and 15 streams, as part of the aquatic effects monitoring program (AEMP).

Monitoring evaluates physical, chemical, and biological components of the aquatic ecosystem: hydrology, physical limnology, lake and stream water quality, phytoplankton, zooplankton, sediment quality and lake and stream benthos. Meteorological data are also reported in the AEMP because of their relationship to site hydrology.

The Koala watershed contains the majority of the Ekati infrastructure including the main camp, the process plant, the Panda, Koala, Koala North, Fox, and Beartooth open pits and associated waste rock storage areas, the Long Lake Containment Facility, and the airstrip.

In the Koala watershed, the aquatic effects monitoring program examines waters downstream of the Long Lake Containment Facility including the Long Lake Containment Facility discharge (SNP station 1616-30), Leslie Lake, Leslie–Moose Stream, Moose Lake, Moose–Nero Stream, Nema Lake, Nema–Martine Stream, Slipper Lake, Slipper–Lac de Gras Stream.

The internal-watershed reference area (Vulture Lake, Vulture-Polar Stream) is located 5 km upstream of the Ekati camp at the north end of the Koala Watershed. Although the Lower Panda diversion channel, Kodiak Lake, and Kodiak–Little Stream are not downstream of the Long Lake Containment Facility, they are monitored and evaluated as part of the aquatic effects monitoring program because of their proximity to mine operations.

Grizzly Lake is the source of potable water for the Ekati Main Camp, and was added to the aquatic effects monitoring program as an evaluated lake in 2009. The northern bay of Lac de Gras near the inflow from Slipper Lake is also monitored because it is considered to be part of the area that may be influenced by mine activities as the Koala watershed flows into this area of the lake.

The King–Cujo Watershed contains the Misery Camp, Misery pit and associated waste rock storage areas, and the King Pond settling facility. All of the aquatic effects monitoring program sampling locations in the King–Cujo Watershed are within the zone of influence of the mine. In the King–Cujo Watershed, monitored locations include the King Pond settling facility discharge (SNP station 1616-43), Cujo Lake, Cujo Outflow Stream and Christine–Lac du Sauvage Stream. The western part of Lac du Sauvage near the inflow from Christine Lake is also considered to be part of the area that may be influenced by the mine because the King–Cujo Watershed flows into this area of the lake.

The aquatic effects monitoring program sampling also includes two external watershed reference lakes and streams (Nanuq and Counts lakes and their outflows) that are located outside of the zone of influence of the mine. Nanuq Lake is located in the northeast corner of the Ekati claim block approximately 26 km from the nearest possible mine influence. Counts Lake is located southeast of Ekati Main Camp, approximately halfway between the camp and Misery Lake and is approximately 5 km from the closest reach of Misery road, which is the nearest mine influence for this lake.

20.2.3 Fish Habitat Compensation Works

Ekati currently operates under five Fisheries Authorizations. These authorizations provide approval to conduct work that results in serious harm to fish. There are currently two compensation agreements (called offsetting as per the Fisheries Act, 2013) for the Ekati Main site and Lynx Lake.

20.2.3.1. Panda Diversion

Monitoring the Panda diversion channel has successfully demonstrated that it provides effective fish habitat, as documented by DFO. Upon completion of relatively minor physical habitat features, the Authorization will be closed. The channel is used by seven fish species (Arctic grayling, burbot, slimy sculpin, lake chub, round whitefish, longnose sucker, and lake trout) and provides spawning and feeding habitat, as well serving as a migration corridor between Kodiak Lake and North Panda Lake.

20.2.3.2. Nero–Nema Stream Monitoring Program

The Nero–Nema stream is a short, wide stream that flows from Nero Lake to Nema Lake in the Koala watershed. During the winter of 2002 to 2003, an open-span bridge for the Fox access road was installed over Nero–Nema stream. The construction of this bridge resulted in a loss of fish habitat, specifically spawning habitat for Arctic grayling. From 2005 to 2007, eight gravel enhancement pads were installed upstream and downstream of the bridge. These gravel enhancement pads were successful and the Fisheries Act Authorisation was fully satisfied with a release issued by the DFO.

20.2.4 Seepage

Seepage is monitored at several locations at each of the four active waste rock dumps. Seepage surveys have been conducted for the past 10 years and publicly reported by Dominion. There have been no environmental compliance issues noted.

20.2.5 Waste Management Plan

Version 2.0 of the waste management plan was approved by the Wek’èezhìi Land and Water Board in February 2016. The waste management plan includes the following plans:

- Hydrocarbon management plan;
- Solid landfill waste management plan;
- Hazardous waste management plan;
- Composter management plan;
- Incinerator management plan.

The waste management plan also references the waste rock and ore storage management plan and the wastewater and processed kimberlite management plan. Version 5.1 of the waste rock and ore storage management plan was approved by the Wek’èezhìi Land and Water Board in November 2015. The plan incorporates updates of the acid/alkaline rock drainage (ARD) and geochemical characterization and management plan that had been prepared since 2007 as a separate document, such that the waste rock and ore storage management plan is a comprehensive document.

Version 5.1 of the wastewater and processed kimberlite management plan was approved by the Wek’èezhìi Land and Water Board in November 2015.

Annual reports on the ongoing waste rock sampling program are also reported to the Wek'èezhìi Land and Water Board. The operational geochemical test results validate the initial characterisation and waste rock management plans.

20.2.6 Wildlife Effects Monitoring

A wildlife effects monitoring program is performed each year. The monitoring program includes assessing site-specific effects on caribou, wolverine, grizzly bear, wolf, birds, fox, and other species that may interact with the Ekati mine site. Ekati takes part in government-led initiatives for regional monitoring and has contributed to government-led regional programs for caribou, wolverine and grizzly bear.

20.2.7 Re-vegetation

Dominion has been conducting reclamation research and field studies in support of the reclamation goals outlined in the Interim Closure and Reclamation Plan for the mine.

Re-vegetation has been conducted and is assessed at the Long Lake Containment Facility, Culvert Camp, Fred's Channel, Esker South, Old Camp Road, Misery topsoil stockpile, Koala topsoil stockpile, Fay Bay, and at the Pigeon stream diversion, and Panda diversion channel.

Re-vegetation research has focused on:

- Assessment of potential for vegetation of camp pads and laydown areas;
- Vegetation of fine processed kimberlite at the Long Lake Containment Facility;
- Development of reclamation research plans for closure criteria.

20.2.8 Air Quality (AQMP)

The Ekati air quality monitoring program comprises the following components:

- Air emissions and greenhouse gas calculations;
- Total suspended particulate matter (TSP) measurements through Partisol samplers;
- Continuous ambient air sampling (NOx, SO, TSP and PM2.5);
- Dustfall monitoring;
- Snow sampling;
- Lichen sampling.

Emissions calculations and high volume air sampling have been conducted yearly since the start of the program, while snow and lichen sampling programs have been conducted every three years. Results from the AQMP suggest that management measures implemented at Ekati are currently effective at mitigating the effects of the mine on air quality.

20.2.9 Geotechnical Inspections

A requirement of the water license is annual independent geotechnical inspections of dams, dikes and water holding facilities at the Ekati Diamond Mine. Since construction these inspections have been carried out by EBA Engineering of Yellowknife. No significant issues have been raised.

20.3 Environmental Liabilities

Current environmental liabilities comprise those to be expected of an active mining operation that is exploiting a number of kimberlite pipes, and includes open pits, processing plant, infrastructure buildings, a processed kimberlite storage facility, waste rock storage facilities, and access roads.

20.4 Closure and Reclamation Plan

Version 2.4 of the Ekati Mine interim closure and reclamation plan was approved by the Wek´èezhìi Land and Water Board in November 2011. The Ekati Diamond Mine is required under Water Licence W2012L2-0001 and the Environmental Agreement to have a closure plan in place for the Ekati Diamond Mine during active mining operations, and to update that plan on a regular basis and/or when there is a significant change to the Mineral Reserves mine plan. A final closure and reclamation plan will be required two years prior to mine closure.

The Interim Closure and Reclamation Plan is developed with input from Impact Benefit Agreement communities and regulatory agencies, and incorporates specific reclamation activities and objectives detailed in conformance documents that include water licences, the Environmental Agreement, land use permits, and land leases.

Reclamation of the mine site is guided by the reclamation goal to return the Ekati Project site to viable, and wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and the surrounding environment. Closure objectives are used to guide reclamation activities through the use of closure criteria and performance based standards that measure the performance of closure activities in successfully meeting closure objectives.

Development of the Jay pipe will require changes to the Interim Closure and Reclamation Plan, which are primarily related to new reclamation activities at Lac du Sauvage, and an amended pit back-flooding approach for the Lynx, Misery, Panda, and Koala open pits.

- The Jay Pit will be back-flooded at closure. It is estimated that natural lake water levels will be re-established by back-flooding using waters primarily sourced from Lac du Sauvage, and that the back-flooding will take approximately four years. Water quality within the back-flooded diked area will meet pre-defined acceptability criteria before permanent breaching of the dike or return to natural flow paths;
- The Misery open pit will be utilized as a water management facility during the mining of the Jay pipe. At completion of the Project, a portion of the mine water contained within the Misery pit will be pumped to the bottom of the Jay pit, and the remaining water within the pit will be covered by freshwater from a combination of precipitation, runoff, and lake water from Lac du Sauvage;
- The Lynx open pit will be used for the storage and management of lake water containing elevated total suspended solids pumped from Lac du Sauvage during the dewatering phase of the Jay operation. The suspended sediment will settle out and the pit will be monitored to confirm water quality is suitable for discharge before the Lynx pit lake overflow to Lac de Gras is re-established;
- The Panda and Koala open pits are the primary deposition locations for processed Jay kimberlite. Reclamation of the Panda and Koala open pits would proceed by pumping freshwater into the pits as a “cap” overlying the processed kimberlite and, possibly, residual mine water. This pumping scenario is an improvement over the current proposed reclamation because substantively less freshwater is required.

The ICRP will be amended to include these activities. Other aspects of reclamation of Ekati Mine would proceed as described in the existing interim closure and reclamation plan. Community and regulatory engagement will continue to be an important component for closure and reclamation planning.

20.5 Reclamation Security

A total of $298.9 million dollars is currently held for reclamation security of the Ekati Diamond Mine. A total of $11.2 million is required by the Wek’èezhìi Land and Water Board to be posted prior for future developments at the Sable open pit and prior to commence of for the early works associated with the Jay open pit. An additional $13.9 million has been proposed by Dominion to be required for the remaining development of the Jay open pit.

- The current reclamation security held under Water Licence (W2012L2-0001) and Land User Permit (W2008D0008) is equal to $257.0 million. This amount includes reclamation costs for the existing development areas and new construction of the Pigeon and Lynx open pits. This also includes an initial posting of $0.7 million for infrastructure development of the Sable open pit. Three additional phased postings totaling of $9.7 million has been set by the Wek'èezhìi Land and Water Board for the future development of the Sable open pit;
- Security of approximately $20.0 million is held for reclamation and related activities at the Ekati Mine required under the Environmental Agreement. Dominion has also provided a $20 million guarantee required under the Environmental Agreement;
- Additional security of approximately $1.9 million is held under four Fisheries Act Authorizations;
- As part of the granting of the Jay Early Works Land Use Permit the Wek'èezhìi Land and Water Board set a reclamation security cost of $1.5 million before the commencement of the Jay Early Works construction (roads and pads). Dominion has provided a proposed security estimate of $13.9 million for the remaining components of the proposed Jay Development. The proposed security estimate is undergoing review as part of the regulatory process for the Jay Type A Land Use Permit and amendment to the Ekati Type A Water Licence.

20.6 Considerations of Social and Community Impacts

20.6.1 Impact Benefit Agreements

As noted in Section 4.3.3, there are four impact benefit agreements that have been concluded with Aboriginal groups.

20.6.2 Socio-Economic Agreement

A Socio-Economic Agreement was concluded with the Government of the Northwest Territories, and has been in place since 1996. This agreement addresses the economic benefits and social impacts of the Ekati operation on the Northwest Territories, and establishes northern and northern-aboriginal hiring targets and northern business spend targets. The agreement also provides a vehicle for joint industry-government community training and northern recruitment programs.

20.6.3 Community Development Programs

Dominion provides financial support for projects that support the development of long-term sustainable community initiatives, including:

- Physical projects such as community centres;
- Cultural programs such as sharing of traditional knowledge;
- Community social support programs such as women’s transitional housing programs and at-risk youth programs.

20.6.4 Traditional Knowledge

Dominion tries to incorporate the use of traditional knowledge in monitoring programs by involving communities in the programs and teaching the environmental staff the traditional way of the land. Currently, several annual visits are paid by Elders and youth to the Ekati Project site.

Dominion holds several traditional knowledge-oriented community outreach events annually, which include:

- Community visits;
- Cultural workshops at the Ekati Diamond Mine;
- Funding for community programs and events.

20.6.5 Proposed Jay Development

The focus of Dominion’s engagement efforts for the planned Jay operation has, and continues to be, directed towards parties that will likely be the most directly affected if the Project is implemented or is not implemented. The engagement includes potentially affected Aboriginal communities, other Northerners, government and regulatory agencies, and the Independent Environmental Monitoring Agency.

Dominion has held a series of information workshops for communities, regulators, governments, and parties to the environmental assessment process to explain the proposed Jay operation and the contents of the Developer’s Assessment Report and the proposed Management Plans. Dominion also developed a visualization program to assist in explaining the Jay project in the environmental assessment hearing and in meetings with communities and stakeholders. This visualization program includes a physical model that is being used in engagement activities and computer generated images that show the various stages of the Jay project.

Dominion will also continue with its current practice of quarterly engagement meetings and with additional engagement, as required, through written exchanges, public meetings, and face-to-face meetings and workshops to discuss specific issues of interest and to maintain two-way dialogue about the Jay mine proposal with the affected parties.

20.7 Comments on Environmental Studies, Permitting, and Social or Community Impact

In the opinion of the responsible QPs, the permitting, environmental and social licence requirements to operate the Ekati Diamond Mine are well understood and Mineral Resource and Mineral Reserve estimation can be supported.

Land use permits were renewed in 2016, and are in good standing.

It is possible that future changes in water quality discharge limits or unanticipated future changes in water quality due to processing of kimberlite ore could result in the need for additional water management facilities. Adaptive management is practiced to alert mine management and regulators of new trends in water quality data, thereby providing adequate time for implementation of preventative actions before environmental impacts or fines would occur.

Various amendments to the Fisheries Act (including the possible inclusion of diamond mines into the Metal Mine Effluent Regulations (MMER)) have been implemented or proposed by the Federal Government and these could affect permitting of new projects at the Ekati Mine. As a group, Canadian diamond mines have sought for several years the regulatory certainty provided to other types of mines through Schedule 2 of the MMER. The Schedule 2 process allows for regulatory approval of processed kimberlite disposal into certain waters that fall under jurisdiction of the Fisheries Act, where this has been demonstrated to be the most reasonable approach. Canadian diamond mines are involved in the current Environment Canada consultation process on proposed changes to the MMER in an attempt to gain this regulatory certainty on the basis of fairness across the mining industry.

The regulatory reform of the Canadian Environmental Assessment Act (CEAA) does not affect the Ekati Diamond Mine because the Mackenzie Valley Resource Management Act supersedes the CEAA in the Northwest Territories.

There is a risk associated with the permitting processes assumed for the Jay project, due to the need to have approvals in place to mine the Jay pipe so production at the Ekati Project can continue after 2023. The Early Works permit for the Jay road construction has been received. For operations at Jay, Dominion still requires issuance of a Water Licence and Jay Land Use Permit.

21.0 CAPITAL AND OPERATING COSTS

Capital and operating costs are based on a life-of-mine cost model which assumes that the Ekati processing plant operates at optimal throughput for the material to be fed in each year, including the processing of Inferred Mineral Resources and reprocessed plant rejects. Mining and processing costs were reduced to reflect the amount of mining and tonnes processed in the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan.

Investors are cautioned that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, and that the Operating Case Mine Plan includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the Operating Case Mine Plan will be realized. .

Capital and operating costs are reported on a financial year end date of 31 January.

21.1 Capital Cost Estimates

The capital cost estimate is the same for the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan.

21.1.1 Koala, Misery, and Pigeon

No capital is included for the Koala underground, the Misery open pit, and the Pigeon open pit, as all capital costs for these operations are considered to be sunk costs. Minor sustaining capital provision has been made for equipment replacement related to these operations.

21.1.2 Lynx

The Lynx open pit is currently in pre-stripping, with all infrastructure construction including all-season road access and dewatering completed.

Remaining pre-stripping costs at Lynx prior to commercial production will be capitalized for accounting purposes, but are including in the operating cost estimate in 2H FY17 for the purposes of the cost model in this Report.

21.1.3 Sable

Initial development capital for Sable is based on a re-forecast completed in July 2016 for 2H FY17, and the Sable PFS for the remainder of the project. Capital costs used in the Sable PFS were obtained from a variety of sources, including internal Dominion estimates based on historical actuals, contractor estimates, and budgetary quotes from suppliers.

Capitalized expenditures on initial project works in 1H FY17, primarily to mobilise construction equipment and to establish an all-season access road to the Sable site, are included in the total project development capital estimate, but are not included in the economic analysis presented in Section 22 of this Report, which begins in 2H FY17.

Capital allocations for mine and support overhead, which are likely to be incurred whether or not the project is built, are not included in initial development capital, but are included in the operating cost estimate for the purposes of the economic analysis in this report.

Pre-stripping costs at Sable prior to commercial production will be capitalized for accounting purposes, but are including in the operating cost estimate in FY19 for the purposes of the economic analysis in this report.

An exchange rate of 1.33 C$:US$ was assumed for all capital costs. Mine development costs were estimated in C$, while mobile equipment costs were largely estimated in US$.

21.1.4 Jay

21.1.4.1. Capital Cost Estimates (Golder)

Initial development capital for Jay is based on a re-forecast completed in July 2016 for 2H FY17, and the Jay FS for the remainder of the project. Approximately half of the initial development capital estimate in the Jay FS, including the dike, road and pipeline estimates, were prepared by Golder.

The cost estimate produced by Golder was based on the calculation of specific rates applied to units of measure for labour, equipment and materials against the detailed activities identified to complete each scope of work. Productivity factors were considered along with general overhead and indirect costs relating to freight, flight and camp costs, the rental rates for temporary site facilities, fuel consumption and construction supervision. Dominion provided Golder with typical labour rates for use in resource loading costs against detailed activities.

The dike construction estimate was based on Issue-for-Tender level drawings and quantities. Golder used industry standard rental, diesel fuel usage, maintenance, and insurance rates for all development capital construction equipment. Golder also identified the volume and estimated costs of bulk bentonite and cement that would be purchased by Dominion Diamond to facilitate the dike cut-off wall construction.

The pipeline construction and dewatering estimate included all equipment purchases, installing the steel and HDPE pipelines and pumping/booster stations, and the supply and install of all fittings spanning the length of the pipeline. This infrastructure will be constructed from the Jay pit to the Misery pit, and includes a temporary booster station to maintain flow rates from Misery pit to the Lynx pit. The effort to dewater the isolated lake was included within this portion of the estimate.

Golder also estimated the costs of all labour, equipment and materials costs to construct the Jay and North haul roads, laydown areas, the pipeline road towards the Misery Pit, an ore transfer pad, and the waste and ore haul roads.

The engineer's estimate prepared by Golder was validated against the results of a request for information (RFI) process in which four construction contractors with experience in heavy civil works in remote areas were asked to submit budgetary cost estimates for the main components of the work.

Golder also provided estimates for future engineering support, fishing out the isolated lake, providing environmental and regulatory permitting support to Dominion, and providing engineering and quality assurance support throughout the construction timeline.

The portion of the total Jay initial development capital cost estimate prepared by Golder is summarized in Table 21-1. These costs are exclusive of contingencies, which were applied by Dominion to these estimates to calculate a total project cost.

Table 21-1: Golder Capital Cost Estimates, Jay Project ($C million)

Cost Area	Costs
Roads, Dike & Pumping Systems	361
Engineering, Design, Consulting	47
Environmental	8
Total	***417***

Note: Totals may not sum due to rounding

21.1.4.2. Additional Capital Cost Estimates (Dominion)

The other half of the capital cost estimate in the Jay FS, including Owners' costs and the balance of the project infrastructure, were prepared by Dominion based on internal estimates derived from historical actuals, contractor estimates, and budgetary quotes from suppliers.

Capitalized expenditures on initial project works in 1H FY17, primarily to purchase and commission the project's aggregate crusher and associated mobile equipment, are included in the total project development capital estimated in the Jay FS, but are not included in the economic analysis presented in Chapter 22 of this report, which begins in 2H FY17.

Capital allocations for mine and support overhead, and for supply of waste rock from the Lynx pit to the project, which are likely to be incurred whether or not the project is built, are not included in initial development capital, but are included in the operating cost estimate for the purposes of the economic analysis in this Report.

Pre-stripping costs at Jay prior to commercial production will be capitalized for accounting purposes, but are including in the operating cost estimate in FY22–23 for the purposes of the economic analysis in this report.

An exchange rate of 1.33 C$:US$ was assumed for all capital costs. Mine development costs were estimated in C$, while mobile equipment costs were largely estimated in US$.

21.1.5 Development Capital Costs

21.1.5.1. Sable Capital Costs

The Sable PFS estimated capital costs for the development of the Sable Project as follows:

- Establishment of all-season access to the Sable site, as well as roads at the project site, is estimated at $30 million;
- Water controls, including a frozen core dam at the outlet of Two Rock Lake, and a filter dike in the middle of Two Rock Lake, are estimated at $9 million;
- Infrastructure, including fuel tanks, a fabric maintenance shelter, and local electrical generation and distribution is estimated at $15 million;

- Mobile equipment, including one hydraulic shovel, three smaller loading units, six haul trucks (which will be shared with Jay), one drill, and various support equipment is estimated at $71 million;
- Project indirect costs, including construction management and engineering, are estimated at $32 million;
- Owners' costs, such as the project team labour and expenses to support construction, are estimated at $9 million.

An overall contingency of 14% or $23 million has been allocated based on the remaining uncertainty associated with each project component.

Estimated initial development capital costs for the Sable project based on the Sable PFS are summarized in Table 21-1. As discussed in the basis of estimate, these totals are inclusive of capital expenditures during 1H FY17, and exclusive of capital allocations and pre-stripping costs.

Table 21-2: Development Capital Cost Estimate, Sable Project (C$ million)

Cost Area	FY17	FY18	FY19	Total
Site Access and Roads	28	2	-	30
Water Controls	3	6	-	*9*
Infrastructure	6	9	1	*15*
Mobile Equipment	8	50	12	*71*
Project Indirects	13	15	4	*32*
Owner's Costs	5	3	1	*9*
Contingencies	10	11	3	*23*
Total	***72***	***97***	***21***	***190***

Note: Totals may not sum due to rounding.

21.1.5.2. Jay Capital Costs

The Jay FS estimated capital costs for the development of the Jay Project as follows.

The primary capital development cost will be the construction of a water retention dike and its associated infrastructure, including crushing, roads and pumping infrastructure, which amounts to $437 million. Engineering, design, crusher quality control, and quality assurance costs are estimated at an additional $56 million.

Equipment costs are estimated to be $114 million, which includes the purchase of eight haul trucks, one hydraulic shovel, four front-end loaders, three production drills, two dozers, and other support equipment. The maximum fleet required for construction would be 19 haul trucks, but the capital cost estimate is based on renting

11 additional smaller haul trucks that would not be used during mine operations. Other smaller pieces of mining equipment and specialized dike construction equipment will also be rented during the construction phase.

To support a large truck fleet remote from the main Ekati Mine site infrastructure, new maintenance facilities and upgrades to existing facilities would be required at a cost of $20 million.

Blending options are available during the initial processing stages of Jay kimberlite which will offset the expected high clay content in the upper portion of the Jay pipe. In addition, plant upgrade studies will be undertaken to identify material handling upgrades required to be able to efficiently process Jay material at a throughput rate of 4.35 million dry metric tonnes per year. These studies are at an early stage, but an allowance of $53 million has been allocated based on the cost of similar-scale projects in the Ekati processing plant. Blending with Sable ore and stockpiling upper bench ore to blend with lower, less clay-rich ore may reduce the scope of processing plant investment.

Other capital costs include $29 million in project team labour and expenses to support the construction activities, $17 million for a power connection between the Misery camp and the Jay site, $17 million to expand the Misery camp to accommodate the construction workforce, $12 million in environmental/permitting costs including fish salvage and offsetting, and $6 million in road upgrades.

An overall contingency of 13% has been allocated based on the remaining uncertainty associated with each project component, for a total of $100 million in contingency. The total initial capital cost to develop the Jay pipe is $861 million.

Estimated initial development capital costs for the Jay project based on the Jay FS are summarized in Table 21-3. As discussed in the basis of estimate, these totals are inclusive of capital expenditures during 1H FY17, and exclusive of capital allocations and pre-stripping costs.

Table 21-3: Initial Capital Development Cost Estimate, Jay Project (C$ million)

Cost Area	FY17	FY18	FY19	FY20	FY21	FY22	Total
Roads, Dike & Pumping Systems	20	40	54	118	114	92	437
Engineering, Design, Consulting	7	4	7	13	17	7	56
Environmental	4	1	1	4	2	1	12
Mining & Support Equipment	16	0	39	26	0	32	114
Process Plant	-	1	-	7	-	45	53
Camp Construction	-	-	17	-	-	-	17
Power Connection	-	-	-	6	11	0	17
Road Widening	-	0	0	5	-	-	6
Truck Shop	-	-	19	0	0	0	20
Owners Team Costs	3	3	5	6	6	6	29
Contingency	1	6	19	24	21	28	100
Total	***51***	***55***	***162***	***210***	***172***	***211***	***861***

Note: Totals may not sum due to rounding.

21.1.6 Other Development Capital Costs

The Fines DMS circuit (refer to Section 17.3) is expected to be commissioned at the end of FY17. The remaining installation investment is estimated at C$8 million during 2H FY17.

The completion and commissioning of a 69 kV powerline between Misery and Ekati discussed in Section 18.8 is expected in 2H FY17. The remaining installation investment is estimated at C$2 million during 2H FY17.

An expansion of the bridge on the Misery to Ekati haul road at Paul Lake is in progress. This expansion is designed to facilitate the transit of 793F haul trucks between the Lynx and Jay project areas, and the main Ekati truck shop. The bridge is expected to be operational in 2H FY17. The remaining installation investment is estimated at $2 million during 2H FY17.

A new shop is planned for the Ekati Main camp area to service the DPRTs. A DPRT-specific shop will allow for the full length servicing, maintenance and washing of a coupled unit. A permanent tipping wall is also planned, providing the capacity to offload multiple full length DPRT units simultaneously. The shop and tipping wall construction is planned for FY18. The total installation investment is estimated at $17 million.

21.1.7 Sustaining Capital Costs

Sustaining capital costs for the 2H FY17 are based on a re-forecast completed in July 2016. Sustaining capital costs from FY18 to FY21 are forecast to range from $28–$44 million, based on a detailed analysis of mining, processing, and support requirements as developed in the “FY17 Budget and Five-Year Plan”. From FY22 to FY29, sustaining capital is forecast to be $25 million annually, based on an assessment of the average long-term equipment and infrastructure replacement requirements of the mine, with additional allowances for known major equipment purchases such as the planned expansion of the dual-powered road train fleet. From FY30 to FY34, sustaining capital is forecast to gradually decrease to zero as the end of mine life is approached.

21.1.8 Capital Cost Summary

Estimated capital costs for the Ekati Mine are summarized in Table 21-4. As discussed in the basis of estimate, these totals are exclusive of capital expenditures during 1H FY17, capital allocations, and pre-stripping costs.

Table 21-4: Capital Cost Summary (C$ million)

Fiscal Year	Jay Project	Sable Project	Other Development	Sustaining	Total Capital Costs
2H FY17	15	30	11	19	75
FY18	55	97	17	44	213
FY19	162	21	—	44	227
FY20	210	—	—	35	245
FY21	172	—	—	28	200
FY22	211	—	—	33	244
FY23	—	—	—	39	39
FY24	—	—	—	31	31
FY25	—	—	—	25	25
FY26	—	—	—	25	25
FY27	—	—	—	25	25
FY28	—	—	—	25	25
FY29	—	—	—	25	25
FY30	—	—	—	20	20
FY31	—	—	—	10	10
FY32	—	—	—	5	5
FY33	—	—	—	2	2
FY34	—	—	—	1	1
Total	***825***	***148***	***29***	***436***	***1,437***

Note: Totals may not sum due to rounding.

21.2 Operating Cost Estimates

Operating cost estimates have been produced for both the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan.

21.2.1 Basis of Estimates

21.2.1.1. Mine Plans

Operating costs for the Mineral Reserves Base Case Mine Plan are adapted from a XERAS cost model produced in conjunction with the Jay FS in June 2016. Using the Jay FS life-of-mine schedule and costing as a base model, operating costs were adjusted to account for changes to the plan timing as a result of the process plant fire (see Section 17). Variable mining costs were adjusted based on changes to annual total material movement.

After these timing adjustments were complete, mining and processing costs associated with non-reserve material, such as Misery satellite mill feed, and reprocessed plant rejects, were removed from the operating costs. No adjustment was made to camp, G&A, or other costs.

Operating costs for the Operating Case Mine Plan are also adapted from a XERAS cost model produced in conjunction with the Jay FS in June 2016. As with the Mineral Reserves Base Case Mine Plan, using the Jay FS life-of-mine schedule and costing as a base model, operating costs were adjusted to account for changes to the plan timing as a result of the process plant fire. Variable mining costs were adjusted based on changes to annual total material movement.

After these timing adjustments were complete, mining and processing costs associated with reprocessed plant rejects, were removed from the operating costs. No adjustment was made to camp, G&A, or other costs.

21.2.1.2. Labour Costs

Operating costs were calculated within the XERAS cost model based on rates developed through the Ekati's FY17 budget and five-year plan process. Beyond the five-year plan, the cost model assumes flat real employee compensation. This process is a zero-based approach and costs were calculated as follows:

- Direct Labour: The number of equipment operators was calculated based on the equipment hours calculated in the mine plan. Maintenance headcount and costs were calculated based on the equipment hours in the FY17 budget, with minor adjustments to account for differences between the FY17 budget mine plan and the mine plans in this Report;
- Support Labour: For support labour costs, costs are based on a detailed assessment of the number and type of positions needed, by department to the individual position level, to support the budget and five-year plan. For support headcount beyond the five-year plan, the mix of labour types is assumed to stay constant.

21.2.1.3. Material Costs

21.2.1.3.1. Mining Consumables

Mining costs were calculated based upon the production plan, which includes drilling, blasting, loading, and transportation or hauling activities for open pit mining and production and development drilling, blasting, loading, and rehabilitation for underground mining at Koala. Drill and blast consumables were calculated based upon rates developed for metres drilled and tonnes blasted. Fleet costs, such as tires and ground engaging tools used in the above activities, were calculated based upon production hours and consumption rates. These consumption rates were developed based on actual materials consumed in the mining process. The cost per tonne of bulk mining consumables such as ammonium nitrate and cement are affected by both variable market conditions and by transportation costs to Yellowknife and from Yellowknife to Ekati via the winter road.

21.2.1.3.2. Diesel

The production plan forecasts production hours required by the major and support fleet. Each piece of the fleet has a diesel burn rate per production hour in the XERAS cost model. This rate is based upon an historical burn rate and is verified annually. Power consumption is forecast by feeder, and combined with forecasted generation efficiencies to generate a diesel consumption forecast.

The average diesel rate forecast includes fuel purchase, transportation, storage, distribution, and applicable fuel excise tax. Diesel prices assumed are CAD 1.10 per litre for heating, CAD 1.13 per litre for power generation, CAD 1.17 per litre for non-motive equipment, and CAD 1.23 per litre for motive equipment. The cost per litre of diesel delivered to Ekati is affected by both variable market conditions and by transportation costs to Yellowknife and from Yellowknife to Ekati via the winter road.

21.2.1.3.3. Maintenance

Maintenance costs were forecast using a XERAS model. The model uses the combination of equipment maintenance strategies and mine/processing plan equipment hours to project maintenance events for mining equipment and fixed plant. An exchange rate of 1.33 C$:US$ was assumed for the purchase of parts priced in US$ which are used in mobile and fixed plant maintenance.

21.2.1.3.4. Processing Consumables

Variable processing costs such as reagents are calculated using a XERAS cost model based upon consumption factors and tonnes of ore processed.

21.2.1.4. Camp Costs

Camp costs such as travel, catering and cleaning are based on the number of people at camp throughout the life of mine. Other support costs such as site services, warehouse, and training costs are based upon the FY17 budget and five-year plan with reductions in costs beyond the five-year plan to reflect the mining and processing activities to be supported in those years.

21.2.1.5. General & Administrative Costs

General & Administrative costs such as finance, information technology, and human resources are based upon the FY17 budget and five-year plan with reductions in costs beyond the five-year plan to reflect the decreasing complexity of the operation in the later years of the mine plan.

21.2.1.6. Reclamation Costs

The reclamation costs of $297 million were based on the Ekati Mine's closure cost model that includes all regulatory reclamation activities required by the Wek'èezhìı Land and Water Board (WLWB) approved Interim Closure and Reclamation Plan and those proposed in the Conceptual Closure and Reclamation Plan for the Jay project. Additionally this cost includes reclamation obligations as part of the Ekati Mine's Environmental Agreement.

These costs are not included in the operating cost forecast, but are included in the economic analysis presented in Section 22.

21.2.1.7. Marketing Costs

Dominion sorts its rough diamonds in Belgium, Canada, and India and then distributes the resulting sales parcels to its Belgian and Indian subsidiaries for sale. The models are based on production sales revenue (assume that all diamonds are sold in the year of production). Marketing costs are estimated at C$14 million per annum, including all Ekati-specific marketing costs and a proportional allocation of Dominion corporate marketing costs.

These costs are not included in the operating cost forecast, but are included in the economic analysis presented in Chapter 22.

21.2.2 Operating Cost Summary

Currently estimated life-of-mine operating costs, generating using the basis of estimate described in Section 21.2.1 are summarized in Table 21-5 and Table 21-6, using present-day dollar terms.

Table 21-5: Mineral Reserves Base Case Mine Plan Operating Costs (C$ million)

Fiscal Year	Mining Costs	Processing Costs	Camp and G&A Costs	Total Operating Costs
2H FY17	145	34	73	252
FY18	265	58	199	522
FY19	241	51	197	489
FY20	209	66	194	469
FY21	186	66	186	437
FY22	204	48	161	414
FY23	178	68	163	408
FY24	180	67	163	410
FY25	167	67	122	356
FY26	154	67	122	343
FY27	136	67	122	325
FY28	150	67	122	339
FY29	143	67	122	332
FY30	129	67	122	317
FY31	120	67	121	309
FY32	105	67	121	293
FY33	106	67	114	287
FY34	52	56	50	158
Total	***2,868***	***1,119***	***2,475***	***6,463***

Table 21-6: Operating Case Mine Plan Operating Costs (C$ million)

Fiscal Year	Mining Costs	Processing Costs	Camp and G&A Costs	Total Operating Costs
2H FY17	149	34	73	257
FY18	269	66	199	534
FY19	242	61	197	500
FY20	209	66	194	469
FY21	186	66	186	437
FY22	204	50	161	415
FY23	178	68	163	408
FY24	180	67	163	410
FY25	167	67	122	356
FY26	154	67	122	343
FY27	136	67	122	325
FY28	150	67	122	339
FY29	143	67	122	332
FY30	129	67	122	317
FY31	120	67	121	309
FY32	105	67	121	293
FY33	106	67	114	287
FY34	52	56	50	158
Total	***2,879***	***1,139***	***2,475***	***6,492***

Mining costs include direct open pit and underground mine operating costs as well as mobile maintenance, fixed plant maintenance related to the underground, and mine technical services. Pre-stripping costs at Lynx, Sable, and Jay prior to commercial production will be capitalized for accounting purposes, but are included in the mining operating costs below for the purposes of the economic analysis in this Report.

Processing costs include processing plant operations, power consumption related to the process plant, and fixed plant maintenance related to the process plant.

Camp costs include communications, site management, training, project engineering services, maintenance engineering and planning, electrical services, maintenance services, power consumption not related to the process plant, travel, contracts and purchasing, catering and cleaning, warehouse, health and safety, security, site services, and strategic planning.

General and administrative costs include administration, information technology, environment and communities, external affairs, finance, human resources, and legal.

Reclamation, marketing, and other costs are not included in total operating costs.

21.3 Comments on Capital and Operating Costs

The responsible QPs consider that the information discussed in this section supports the estimation of Mineral Reserves, based on the following:

- Capital and operating cost estimates for the Mineral Reserves Base Case Mine Plan are based on the “FY17 Budget and Five-Year Plan”, the Sable PFS, the Jay FS, the estimated equipment, labour, and consumables required for each year of production, first-principle calculations and checks, and the estimated Mineral Reserves reported in Section 15;
- The capital costs are estimated by project study level, and/or projected infrastructure requirements;
- For both the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan, capital costs are estimated at $1,002 million of development capital and $436 million of sustaining capital for each plan. Jay pipe development capital is estimated at $825 million, and Sable pipe development capital is estimated at $148 million;
- Direct and indirect operating costs are estimated at $6.4 billion in the Mineral Reserves Base Case Mine Plan, and $6.5 billion in the Operating Case Mine Plan. Current reclamation costs are estimated at $297 million including the costs of reclaiming all works associated with all the pipes in the mine plan. Marketing costs are estimated at $240 million for both Mineral Reserves Base Case Mine Plan and Operating Case Mine Plan;
- Operating costs can be affected by the duration of the period available for usage of the ice road to bring in supplies, and by changes in fuel prices, as all electricity is generated by diesel on site.

22.0 ECONOMIC ANALYSIS

The results of the economic analysis to support Mineral Reserves represent forward-looking information that is subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Forward-looking statements in this Report include, but are not limited to, statements with respect to future diamond valuations and diamond sales contracts, the estimation of Mineral Reserves and Mineral Resources, the realization of Mineral Reserve estimates, the timing and amount of estimated future production, costs of production, capital expenditures, costs and timing of the development of new kimberlite pipes, permitting time lines for development of new pipes or treatment of stockpiles, requirements for additional capital, exchange rate assumptions, in particular Canadian/US dollar exchange rate, government regulation of mining operations, accidents, labour disputes and other risks of the mining industry, environmental risks, unanticipated reclamation expenses, continuation of the social licence to operate, and title disputes or claims.

Without limiting the generality of the above risk statements, some specific risks can come from changes in parameters as mine and process plans continue to be refined. These include possible variations in Mineral Resource and Mineral Reserve estimates, grade or recovery rates; diamond reference price estimate assumptions; geotechnical considerations during mining and geotechnical and hydrogeological considerations during Jay Dike construction and operation, including impacts of mud rushes, pit wall failures, or dike integrity; failure of plant, equipment or processes to operate as anticipated if granite or clay content of ore increases over the assumptions used in the mine plan; modifications to existing practices so as to comply with any future permit conditions that may be imposed by the appropriate regulator; and delays in obtaining regulatory approvals and lease renewals.

Investors are cautioned that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability and are further cautioned that the Operating Case Mine Plan includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the Operating Case Mine Plan will be realized.

22.1 Methodology Used

To support estimation of Mineral Reserves, Dominion prepared an economic analysis to confirm that the economics based on the Mineral Reserves could repay life-of-mine operating and capital costs. The Ekati Diamond Mine was evaluated on an after-tax, project stand-alone, 100% equity-financed basis at the project level, using diamond valuations as at 30 June, 2016, and a 7% discount rate.

22.2 Financial Model Parameters

The model was prepared starting in the second half of fiscal year 2017. The model start date is August 1, 2016.

22.2.1 Mineral Resource, Mineral Reserve, and Mine Life

The financial analysis is based on two cases:

- The Mineral Reserves Base Case Mine Plan is based on Probable Mineral Reserves of 70.4 dry Mt grading 1.6 cpt. The mine life based on the Mineral Reserves Base Case Mine Plan is 18 years, to FY34;
- The Operating Case Mine Plan is based on Probable Mineral Reserves of 70.4 dry Mt grading 1.6 cpt, and Inferred Mineral Resources in the Misery South and Misery Southwest Extension areas of 1.2 dry Mt grading 2.6 cpt. The Operating Case Mine Plan also has a mine life of 18 years, to FY34.

22.2.2 Metallurgical Recoveries

Mineral Reserves are reported at +1.0 mm (diamonds retained on a 1.0 mm slot screen and inclusive of small diamonds recovered by the Fines DMS circuit which is scheduled for commissioning in late FY17). The current forecast production rate for Ekati main process plant is 4.35 million dry tonnes per annum.

22.2.3 Operating Costs

Direct and indirect operating costs are estimated at $6,463 million in the Mineral Reserves mine plan, and $6,492 million in the Operating Case mine plan. Marketing costs, royalty payments and estimated reclamation costs are included as separate line items to the operating cost estimate in the financial analysis.

22.2.4 Capital Costs

The Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan capital costs are estimated at $1,002 million of development capital and $436 million of sustaining capital for each plan.

22.2.5 Royalties

The NWT Royalty payable is either 13% of the value of output of the mine, or an amount calculated based on a sliding scale of royalty rates dependent upon the value of output of the mine, ranging from 5% for value of output between $10,000 and $5 million to 14% for value of output over $45 million. For modelling purposes, an illustrative royalty calculation has been used calculated as 13% of modelled free cash flow.

22.2.6 Working Capital

Movements in working capital are not incorporated in the economic analysis. This applies to rough diamond stocks in inventory at the start of the first year, supplies inventory, accounts receivable and payable.

22.2.7 Taxes

The taxation treatment in this analysis is applied to the Ekati Diamond Mine as a stand-alone whole entity and on a simplified basis. The joint venture partners in the Ekati Diamond Mine are separate parties, each of which are responsible for their own corporate income taxes.

For modelling purposes an illustrative corporate tax calculation has been used calculated as 26.5% of modelled free cash flow post the NWT Royalty. The 26.5% rate is based on the 2016 Federal corporate income tax rate of 15% and the 2016 Northwest Territories corporate income tax rate of 11.5%.

22.2.8 Closure Costs and Salvage Value

A total of $297 million is assumed in the financial analysis to cover life-of-mine closure cost expectations. The financial analysis tables in Section 22.3 only present closure costs through fiscal year 2040 for readability.

22.2.9 Inflation

Inflation is not considered in the financial analysis. All figures are presented on a real basis in 2016 Canadian dollars.

22.2.10 Diamond Prices

Dominion sorts its rough diamonds in Antwerp, Belgium, Toronto, Canada and Mumbai, India and then distributes the resulting sales parcels to its Belgium and Indian subsidiaries for sale. The models are based on production sales revenue (assume that all diamonds are sold in the year of production).

The diamond price forecast used assumes a 2.5% annual increase from the June 2016 Dominion Price Book.

The price forecast by pipe by fiscal year is presented in Table 22-1 for the period of estimated active mine life to FY34.

Table 22-1: Price Forecast by Pipe by Fiscal Year

Area	Item		2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Price (US$/ct)	Underground	Koala	311.72	294.99	299.39	317.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	71.34	67.91	68.67	70.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Misery South	—	—	—	—	—	57.48	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SW Ext.	—	39.33	40.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	—	156.91	160.70	164.72	168.84	173.06	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	—	—	—	142.03	145.58	149.22	152.95	156.77	160.69	164.71	—	—	—	—	—	—	—	—
		Lynx	—	240.91	245.75	251.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	—	—	—	—	—	—	68.15	69.73	71.32	73.17	74.92	75.53	74.17	72.67	73.19	74.85	76.66	87.39

22.3 Financial Results

Results of the financial analysis using the Mineral Reserves Base Case Mine Plan indicated positive economics until the end of mine life in FY34, and supported the declaration of Mineral Reserves.

Over the life of mine outlined in the Mineral Reserves mine plan, assuming a 7% discount rate, the NPV is $1.1 billion and the pre-tax cumulative cash flow is $4.36 billion.

In the Operating Case Mine Plan, also assuming a 7% discount rate, the NPV is $1.2 billion and the pre-tax cumulative cash flow is $4.5 billion.

For both the Mineral Reserves Base Case Mine Plan and Operating Case Mine Plan, given that the mine is generating an immediate positive cash flow, payback period and internal rate of return (IRR) calculations are not relevant.

The cash flow analysis based on the Mineral Reserves Base Case Mine Plan to FY40 is included as Table 22-2.

The cash flow analysis based on the Operating Case Mine Plan to FY40 is included in Table 22-3.

Table 22-2: Mineral Reserves Base Case Mine Plan Cash Flow Analysis Table (includes post-operational closure costs to FY 40)

Area	Item		Mineral Reserves Base Case Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40
Waste mined (wMt)		Total	305.64	10.90	26.01	28.44	31.02	27.88	30.64	21.22	19.20	31.62	27.88	14.01	12.88	10.54	7.35	4.04	1.51	0.51	—	—	—	—	—	—	—
Ore mined (wMt)		Total	75.01	1.53	3.47	3.48	4.55	4.24	2.96	7.50	13.60	0.03	2.06	3.28	4.12	5.46	4.65	5.56	4.49	4.03	—	—	—	—	—	—	—
Ore processed (dMt)	Underground	Koala	2.40	0.81	1.04	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	2.93	0.50	0.98	0.85	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	7.31	—	1.21	1.68	1.32	2.28	0.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—	—	—	1.39	1.75	2.30	3.27	1.24	1.24	0.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	1.09	3.11	3.11	3.57	4.35	4.35	4.35	4.35	4.35	4.35	4.35	3.33	—	—	—	—	—	—
Grade (cpt)	Underground	Koala	0.54	0.47	0.55	0.63	0.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	5.15	4.71	4.67	5.29	6.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	0.47	—	0.44	0.42	0.51	0.51	0.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	0.85	—	—	—	0.67	0.74	0.89	0.93	0.91	0.84	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.77	—	0.69	0.85	0.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	1.76	—	—	—	—	—	—	1.23	1.48	1.40	1.42	1.38	1.55	1.88	2.08	2.19	2.22	2.18	1.39	—	—	—	—	—	—
Carats recovered (Mcts)	Underground	Koala	1.30	0.38	0.57	0.28	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	15.07	2.36	4.59	4.47	3.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	3.46	—	0.53	0.71	0.67	1.17	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	10.15	—	—	—	0.93	1.30	2.06	3.04	1.13	1.04	0.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.76	—	0.19	0.10	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	78.64	—	—	—	—	—	—	1.34	4.60	4.35	5.05	6.00	6.75	8.19	9.07	9.52	9.68	9.48	4.64	—	—	—	—	—	—
Revenue	Average Price	US$ / ct	Variable	104.64	103.58	95.27	110.71	156.61	152.92	127.05	86.93	88.60	83.71	74.92	75.53	74.17	72.67	73.19	74.85	76.66	87.39	—	—	—	—	—	—
	Exchange Rate	US$ / C$	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Cash Inflow	C$ M	12,785	381	811	705	853	514	495	739	662	635	636	598	678	807	877	926	964	966	539	—	—	—	—	—	—
Costs	Development Capital	C$ M	1,002	56	169	183	210	172	211	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sustaining Capital	C$ M	436	19	44	44	35	28	33	39	31	25	25	25	25	25	20	10	5	2	1	—	—	—	—	—	—
	Total Operating Costs	C$ M	6,463	252	522	489	469	437	414	408	410	356	343	325	339	332	317	309	293	287	158	—	—	—	—	—	—
	Reclamation Costs	C$ M	277	1	2	3	6	3	3	3	3	8	4	3	3	3	5	4	4	4	4	81	70	31	12	14	3
	Marketing Costs	C$ M	240	7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	—	—	—	—	—	—
	Cash Outflow	C$ M	8,416	335	750	732	735	654	675	464	458	403	386	368	381	374	356	336	316	306	177	81	70	31	12	14	3
Net Cash Flow before Taxes		C$ M	4,368	45	60	(27)	118	(140)	(180)	275	204	232	250	230	297	433	520	590	648	660	362	(81)	(70)	(31)	(12)	(14)	(3)

Area	Item		Mineral Reserves Base Case Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40
Tax	NWT Royalty (13% of pre—tax free cash flow)	C$ M	640	6	8	—	15	—	—	36	27	30	33	30	39	56	68	77	84	86	47	—	—	—	—	—	—
	Income tax (26.5% of post—NWT royalties free cash flow)	C$ M	1,136	10	14	—	27	—	—	63	47	54	58	53	68	100	120	136	149	152	84	—	—	—	—	—	—
Cash Flow	Revenue less Costs	C$ M	2,592	29	38	(27)	75	(140)	(180)	176	131	149	160	147	190	277	333	377	414	422	232	(81)	(70)	(31)	(12)	(14)	(3)
	Net present value at 7% discount rate	C$ M	1,102																								

Notes to Accompany Cash Flow Table

(1) Value by pipe weighted by production from each pipe.

(2) Tax calculation is illustrative (i.e. applies basic taxes on the year that production and revenue is incurred).

(3) The cash flow table is provided on a 100% ownership basis. As at 31 July, 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.

Table 22-3: Operating Case Plan Cash Flow Analysis Table (includes post-operational closure costs to FY 40)

Area	Item		Operating Case Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40
Waste mined (wMt)		Total	305.64	10.90	26.01	28.44	31.02	27.88	30.64	21.22	19.20	31.62	27.88	14.01	12.88	10.54	7.35	4.04	1.51	0.51	—	—	—	—	—	—	—
Ore mined (wMt)		Total	75.01	1.53	3.47	3.48	4.55	4.24	2.96	7.50	13.60	0.03	2.06	3.28	4.12	5.46	4.65	5.56	4.49	4.03	—	—	—	—	—	—	—
Mill feed mined (wMt)		Total	1.00	0.42	0.51	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ore processed (dMt)	Underground	Koala	2.40	0.81	1.04	0.45	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	2.93	0.50	0.98	0.85	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	7.31	—	1.21	1.68	1.32	2.28	0.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	11.98	—	—	—	1.39	1.75	2.30	3.27	1.24	1.24	0.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.99	—	0.27	0.12	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	44.67	—	—	—	—	—	—	1.09	3.11	3.11	3.57	4.35	4.35	4.35	4.35	4.35	4.35	4.35	3.33	—	—	—	—	—	—
Mill feed processed (dMt)	Open Pit	Misery South	0.12	—	—	—	—	—	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SW Ext.	1.04	—	0.49	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grade (cpt)	Underground	Koala	0.54	0.47	0.55	0.63	0.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	5.15	4.71	4.67	5.29	6.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	0.47	—	0.44	0.42	0.51	0.51	0.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	0.85	—	—	—	0.67	0.74	0.89	0.93	0.91	0.84	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.77	—	0.69	0.85	0.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	1.76	—	—	—	—	—	—	1.23	1.48	1.40	1.42	1.38	1.55	1.88	2.08	2.19	2.22	2.18	1.39	—	—	—	—	—	—
		Misery South	1.23	—	—	—	—	—	1.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SW Ext.	2.80	—	2.83	2.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carats Recovered (Mcts)	Underground	Koala	1.30	0.38	0.57	0.28	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Open Pit	Misery	15.07	2.36	4.59	4.47	3.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Pigeon	3.46	—	0.53	0.71	0.67	1.17	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Sable	10.15	—	—	—	0.93	1.30	2.06	3.04	1.13	1.04	0.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Lynx	0.76	—	0.19	0.10	0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Jay	78.64	—	—	—	—	—	—	1.34	4.60	4.35	5.05	6.00	6.75	8.19	9.07	9.52	9.68	9.48	4.64	—	—	—	—	—	—
		Misery South	0.14	—	—	—	—	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Misery SW Ext.	2.92	—	1.40	1.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Revenue	Average Price	US$ / ct	Variable	104.64	91.26	83.43	110.71	156.61	147.65	127.05	86.93	88.60	83.71	74.92	75.53	74.17	72.67	73.19	74.85	76.66	87.39	—	—	—	—	—	—
	Exchange Rate	US$ / C$	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Cash Inflow	C$ M	12,950	381	884	787	853	514	506	739	662	635	636	598	678	807	877	926	964	966	539	—	—	—	—	—	—

Area	Item		Operating Case Mine Plan Totals	2H FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40
Costs	Development Capital	C$ M	1,002	56	169	183	210	172	211	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sustaining Capital	C$ M	436	19	44	44	35	28	33	39	31	25	25	25	25	25	20	10	5	2	1	—	—	—	—	—	—
	Total Operating Costs	C$ M	6,492	257	534	500	469	437	415	408	410	356	343	325	339	332	317	309	293	287	158	—	—	—	—	—	—
	Reclamation Costs	C$ M	277	1	2	3	6	3	3	3	3	8	4	3	3	3	5	4	4	4	4	81	70	31	12	14	3
	Marketing Costs	C$ M	240	7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	—	—	—	—	—	—
	Cash Outflow	C$ M	8,446	340	763	743	735	654	677	464	458	403	386	368	381	374	356	336	316	306	177	81	70	31	12	14	3
Net Cash Flow before Taxes		C$ M	4,504	41	121	45	118	(140)	(171)	275	204	232	250	230	297	433	520	590	648	660	362	(81)	(70)	(31)	(12)	(14)	(3)
Tax	NWT Royalty (13% of pre—tax free cash flow)	C$ M	653	5	16	6	15	—	—	36	27	30	33	30	39	56	68	77	84	86	47	—	—	—	—	—	—
	Income tax (26.5% of post—NWT royalties free cash flow)	C$ M	1,159	9	28	10	27	—	—	63	47	54	58	53	68	100	120	136	149	152	84	—	—	—	—	—	—
Cash Flow	Revenue less Costs	C$ M	2,692	26	77	29	75	(140)	(171)	176	131	149	160	147	190	277	333	377	414	422	232	(81)	(70)	(31)	(12)	(14)	(3)
	Net Present Value at 7% discount rate	C$ M	1,188																								

Notes to Accompany Cash Flow Table

(1) Value by pipe weighted by production from each pipe.

(2) Tax calculation is illustrative (i.e. applies basic taxes on the year that production and revenue is incurred).

(3) The cash flow table is provided on a 100% ownership basis. As at 31 July, 2016, Dominion has an 88.9% participating interest in the Core Zone Joint Venture and a 65.3% participating interest in the Buffer Zone Joint Venture.

22.4 Sensitivity Analysis

The sensitivity of the Ekati Project under the Mineral Reserves Base Case Mine Plan assumptions to changes in diamond price, diamond grade, operating costs, capital costs and Canadian/US dollar exchange rate is summarized in Table 22-4. The sensitivity of the mine under the Operating Case Mine Plan assumptions is summarized in Table 22-5. In both tables, net present value at a 7% real discount rate is used as the indicator to evaluate the impact of varying the diamond prices, the grade, the capital costs, the operating costs and the Canadian/US dollar exchange rate on the Ekati Project economics. For the variables in the sensitivity analysis, a ±10% change was applied.

Table 22-4: NPV Sensitivity Analysis under Mineral Reserve Base Case Mine Plan (estimate base case is highlighted)

Parameter	Financial Sensitivity NPV ($ Million)		
	- 10% Change	Base Case	+ 10% Change
Price	583	1,102	1,600
Grade	583	1,102	1,600
Capital Costs	1,191	1,102	1,013
Operating Costs	1,399	1,102	798
US$/C$ Foreign Exchange Rate	1,655	1,102	632

Table 22-5: NPV Sensitivity Analysis under Operating Case Mine Plan (estimate base case is highlighted)

Parameter	Financial Sensitivity NPV ($ Million)		
	- 10% Change	Base Case	+ 10% Change
Price	679	1,188	1,688
Grade	679	1,188	1,688
Capital Costs	1,271	1,188	1,106
Operating Costs	1,479	1,188	896
US$/C$ Foreign Exchange Rate	1,743	1,188	726

The analysis demonstrated that the Ekati Diamond Mine is most sensitive to variations in exchange rate, diamond parcel valuations and diamond grades, less sensitive to fluctuations in operating costs, and least sensitive to changes in the capital cost assumptions.

22.5 Comments on Economic Analysis

Based on the assumptions detailed in the financial analysis of both the Mineral Reserves Base Case Mine Plan and the Operating Case Mine Plan, the Ekati Project demonstrates positive economics over the mine life.

Mineral Resources that are not included in either the current Mineral Reserve Base Case Mine Plan or the Operating Case Mine Plan include a portion of Koala underground, Misery Deep and Fox Deep. Of these deposits, Misery Deep represents the most significant opportunity, due to its high estimated diamond grade, potential for development below the existing open pit, and advanced permitting.

The coarse reject tails, along with additional levels at the Koala underground, and the Mineral Resources estimated at Misery Deep and Fox Deep represent future plant feed upside potential, and some or all of this mineralization may be able to be incorporated in the life-of-mine plan once sufficient additional work has been undertaken.

There is also upside potential to treat low-grade stockpiles, primarily derived from open pit mining at the Fox kimberlite if the grades in the stockpiles can be demonstrated to be economic.

23.0 ADJACENT PROPERTIES

There are no adjacent properties that are relevant to this Report.

24.0 OTHER RELEVANT DATA AND INFORMATION

Dominion notes that calendar years provided in this subsection are advisory, as actual dates will depend on the progress of permitting, engineering, procurement, and construction activities.

24.1 Sable

24.1.1 Project Schedule

Construction of the Sable Project began in 2016. An overview of the timeline and general activities for the Project is provided in Table 24-1.

Table 24-1: Overview of Project Timeline and General Activities for the Sable Project

Year	Project Phase	General Activities
2016	Engineering & Construction	• Complete detailed engineering on all outstanding project components • Complete construction of the Sable Haul Road • Begin site earthworks (roads, pads)
2017	Construction	• Construct Two Rock Dam at the outlet of Two Rock Lake • Construct Two Rock Filter Dike across Two Rock Lake to form Two Rock Sedimentation Pond • Erect site buildings and fuel storage area
2018	Operations	• Take delivery of mobile equipment • Pre-stripping • Release first ore
2019	Operations	• Pit is in full production

Construction is expected to take approximately two years (2016 to 2017). The construction period will be followed by an approximate 6-year operational period (2018 to 2023) during which kimberlite from the Sable Pit will be mined.

24.1.2 Execution Plan

24.1.2.1. Construction

The contractor completed mobilization activities in late 2015 (marshalling equipment, maintenance, and site-specific safety compliance upgrades to equipment). In March 2016, all construction equipment required for the project was shipped on the Tibbitt-to-Contwoyto winter road and was received at Ekati.

A base of operations was established at Ekati in the area of the Beartooth WRSA, and includes a laydown, field shop and office trailers for project personnel.

Construction of the Sable haul road began in April 2016 and as of end July 2016 had reached within 3 km of Sable pipe (see Figure 2-1).

Once road access is established, work will commence on the Two Rock Dam. Construction of the dam, crest access road and turnaround can be achieved, in most part, using conventional earth moving equipment. Most of the dam construction activities must occur during the winter months. Placement of the dam core material will require an ambient air temperature sufficiently cold to maintain frozen core conditions.

Two Rock Filter Dike will be constructed during the summer months after the completion of the Two Rock Dam.

A fish salvage operation was carried out in summer 2016in Two Rock Lake and Sable Lake, prior to dewatering activities.

Once the water level has been lowered in Two Rock Lake, and Two Rock Sedimentation Pond has been established (completion of dam and dike), the complete drawdown of Sable Lake can begin.

Construction activities are expected to be complete by fall of 2017. Contractor demobilization activities will occur the subsequent winter road season (2018).

24.1.2.2. Operations

The Sable kimberlite pipe will be developed over a period of six years (2018 to 2023) using a conventional open-pit truck-and-shovel mining method.

24.1.2.3. Closure

Upon completion of mining at Sable, the intent is to fill the pit with water and eventually reconnect it to the local hydrological system. In order to fill the mined out pit, seasonal pumping from near-by Ursula Lake will be required. Recharge rates and seasonal restrictions will govern the filling time.

The Sable WRSAs will be constructed during mining operations to a design that will meet reclamation requirements for sloping, eliminating any requirement for earthworks after open pit mining is complete.

24.1.3 Risk Assessments

24.1.3.1. Safety

A mid-level risk assessment was completed during July 2015. It was limited to assessing safety risks (e.g. fires, injuries and medical emergencies) for the Sable project during the execution phase and evaluating appropriate levels of response to mitigate the new risks.

A series of impacts resulting from unwanted events were tested and risk-ranked. No critical risks emerged from any of the scenarios.

24.1.3.2. Project Execution

This was supplemented with a Project Execution Risk Assessment conducted in November 2015, focusing on risks associated with project execution, construction of the Sable haul road, and interactions with the Pigeon pit operating teams.

In general all activities discussed were well known and have been done successfully at Ekati since 1998. These activities include open pit mining, road building, culvert installation, crushing, dam and dike construction, and generally operating in adverse climactic conditions. From a technical point of view, no new critical or high risks were introduced as a result of the project. New critical and high risks identified related to the timing of the project and the critical path items required to complete the project on schedule. The mine plan relies on a timely completion of the Sable project to ensure uninterrupted plant feed.

Key risks and mitigation strategies that may be able to be employed to alleviate the risks are provided in Table 24-2.

Table 24-2: Risk and Mitigation Strategies

Activity / Circuit	Unwanted Event / Potential Loss	Causes	Impacts	Risk Level	Mitigation Strategy	Status (July 2016)
Obtain approvals from DFO for water crossings	Approval not granted	Inadequate plan	Delay to project schedule	High	Obtain advanced screening on proposed plan from DFO. Incorporate feedback (if any). Commit to additional habitat creation for disturbed areas.	Approval obtained and crossings successfully constructed.
Mining in Beartooth Dump	Lower than expected productivity	Hard digging	Reduced project progress	High	Plan to blast 100% of material. Mobilize additional drill capable of rotary drilling, which has been the primary bit used at Beartooth WRSA. Additional reliability will be introduced by supplying a Caterpillar 6018 excavator as a back-up loading tool.	Feed from Beartooth WRSA delivered on schedule.
Road Building	Lower than expected advance rate	Severe weather events	Reduced project progress	High	Critical risk driven by consequence. Daily progress tracking by full-time survey and project controls personnel is planned. A plan to reduce required road materials (reduced width and depth) will be created and put into action if advance rate falls to critical levels.	Road construction advancing on schedule.
Road Building	Late finish, unable to construct Two Rock Dam	Lower than expected productivity	Add one year to schedule	Critical	In the event that the Sable Haul Road, Site Development (roads and pads), or Two Rock Dam run late, resulting in an inability to construct the dam, the project will be delayed by one full year until the subsequent winter when the frozen core can be installed. A contingency plan will be put in place which completes other associated infrastructure and earthworks tasks to minimize the impact.	
Site Development	Late start, unable to construct Two Rock Dam	Predecessor tasks took longer to complete	Inability to complete pads in time for dam construction and site material production to begin	Critical		
Dam Construction	Late start, unable to construct Two Rock Dam	Predecessor tasks took longer to complete	Inability to complete the dam in the winter months, add one year to schedule	Critical		

24.1.3.3. Failures and Malfunctions

A failures and malfunctions review was also performed.

The Sable project introduces no new technology or operating methods to Ekati. As it relates to accidents and malfunctions, reviews of proposed newly-constructed infrastructure, namely the Two Rock Dam and Two Rock Filter Dike (collectively forming Two Rock Sedimentation Pond), describe these structures as very low risk. Nonetheless, a Risk Assessment was created to review potential worst-case scenarios. All resulting risks were considered low due the probability of a failure being remote, and the worst-case scenario being of relatively low impact (finite amount of water being released to the environment and no human health and safety impacts).

24.2 Jay

24.2.1 Project Schedule

An overview of the timeline and general activities for the Jay project is provided in Table 24-3.

Table 24-3: Project Schedule

Calendar Year (Fiscal Year)	Mine Year	Project Phase	General Activities
2016 to 2017 (FY17 to FY18)	Early works	Early works	• Contractor selection • Issuance of early works Land Use Permit from Wek'èezhìi Land and Water Board • Set up and commissioning of crusher, crushing and stockpiling of construction materials • Issuance of Water Licence and final Land Use Permit from WLWB • Finalization of detailed design and Issued for Construction (IFC) packages (dikes, access roads, laydowns, and pumping and pipeline systems) • Construction of roads, to within 30 m of Lac du Sauvage, and laydown areas
2018 to 2020 (FY19 to FY21)	Construction Years 1 to 3	Construction	• Crushing of construction materials • Construction of dikes, power line, pipelines, and pumping facilities • Construction of Sub-Basin B Diversion Channel • Expansion of camp at Misery • Construction of maintenance facilities at Misery • Construction of Misery to Jay powerline and substation at Jay • Storage of waste materials at the Jay WRSA • Fish-out within diked area

Calendar Year (Fiscal Year)	Mine Year	Project Phase	General Activities
2021 (FY22)	Construction/ Operations (Year 0)	Construction/ Operations	• Completion of construction (dikes, pipelines and pumping system, diversion channel) • Dewatering of the diked area (including final fish-out) • Use of the Misery Pit for dewatering water management • Back-flooding of the Lynx Pit • Construction of operational roads, operational sumps, ore transfer pads, and laydowns • Construction of power distribution system • Pre-stripping for the Jay Pit
2022 to 2032 (11 years) (FY23 to FY33)	Operations Years 1 to 11	Operations	• Mining of the Jay Pit • Stockpiling kimberlite from the Jay Pit • Processing of kimberlite from the Jay Pit (continues 6-12 months beyond the end of mining operations) • Misery Pit used for minewater management • Construction of a diffuser outfall at Lac du Sauvage • Minewater discharge from Misery Pit to Lac du Sauvage (starting after 7 years of operations) • Placement of waste rock at the Jay WRSA • Placement of FPK and CPK in the mined-out Panda and Koala pits
2033 to 2036 (4 years) (FY34 to FY37)	Closure Years 1 to 4	Closure	• Pumping minewater from the Misery Pit to the Jay Pit • Back-flooding the Jay Pit and the dewatered area of Lac du Sauvage (with lake water) • Back-flooding of the Misery Pit with a cap of freshwater from Lac du Sauvage • Decommissioning of roads and Sub-Basin B Diversion Channel • Reclamation of surface facilities • Breaching of the Jay Dike

24.2.2 Execution Plan

24.2.2.1. Detailed Design Phase

Following issue of an issued-for-tender package, the feasibility design for the pumping and pipeline system, operational roads and infrastructure, and the North Dike will be updated to a detailed design level. Comments received from the contractors during the Request for Proposal process will be reviewed and incorporated as part of the detailed design phase. The issued-for-construction (IFC) drawings and technical specifications package would be completed and provided to the selected contractor before the end of 2017.

The design basis for the new maintenance facilities will be circulated to appropriate vendors for quotes and design development during 2017.

If the combined requirements of the Misery, Lynx, and Jay projects necessitate the Misery road upgrade, a feasibility level design would be prepared in 2017 in preparation for permitting in 2018. A detailed design would be completed in advance of construction in early 2019.

The design of the Jay power distribution system will be advanced following completion of the Jay pumping and pipeline system design and operational roads design. The power distribution system will be used to provide power to the Jay pit during operations.

The studies and conceptual designs for modifications to the processing plant will be advanced to a feasibility and detailed design level before the end of 2018. Any plant modifications will be completed before commencing processing of the Jay kimberlite ore.

24.2.2.2. Construction

Dominion proposes to construct the Jay project components over approximately four years.

The Project schedule assumes that early works construction (e.g., Jay roads, pipeline bench, and laydown areas) will commence once an interim land use permit is available, with dike construction in Lac du Sauvage starting in July 2018, subject to permitting and approvals.

The schedule assumes the following key dates:

- An early works interim Land Use Permit will be granted by September 2016;
- All equipment will be available to complete access road construction in 2017;
- A water licence and full Land Use Permits will be granted in 2017;
- Construction of the Jay Dike will commence by July 2018;
- Fish-out will be complete by fall 2020 to allow dewatering of the diked area in 2021.

24.2.2.3. Operations

The construction period will be followed by an approximately 12-year operational period (calendar year 2022 to 2033) during which kimberlite from the Jay Pit will be mined and/or processed. The Jay pit will be mined using a conventional open-pit truck-and-shovel method. Mining is expected to end in calendar year 2032 (FY33) and ore processing in calendar year 2033 (FY34).

24.2.2.4. Closure

Reclamation of some existing facilities that have no ongoing operational use will proceed during the Project. This will include, for example, Cells A, B, and C of the Long Lake Containment Facility, and Pigeon pit. Reclamation of other existing facilities will proceed upon completion of the Project, including, for example, the Ekati main camp and processing plant.

Active closure will occur after the completion of mining, and is currently scheduled to take place over four years starting in 2034.

24.2.3 Risk Assessments

A risk assessment workshop was held at the Ekati Diamond Mine in August 2015 as part of the Jay FS. The risk assessment addressed the activities associated with the construction, operations, and closure/post-closure phases of the Jay project components.

The risk assessment considered all consequence categories in Dominion's Risk Management System, including project budget variance, liquid cash, mine shutdown, project delays, security, health, safety, environment, legal/regulatory, community perception/stakeholder relations, and strategy.

The risk assessment began with the identification of risk scenarios, including the unwanted event, causes, consequences, and the existing (or planned) controls. For each risk scenario, the consequence severity and likelihood of the risk occurring were estimated. A risk rating of Critical, High, Moderate, or Low was determined for each risk scenario according to the Dominion risk matrix, based on the estimated consequence severity and likelihood with the implementation of the existing controls. Additional controls were also identified when applicable, for further evaluation.

Critical risks and the planned mitigations are provided in Table 24-4.

Table 24-4: Risk Register and Mitigation

Risk	Impact	Mitigation	Status (July 2016)
Rejection or unworkable requirements from the permitting and licensing process.	Considerable changes, delay, or cancellation of the project.	Dominion would continue its frequent engagement with communities and relevant government agencies and its focus on Northern issues. It would continue to provide Project documentation and supporting information to meet the permitting and licensing requirements.	This risk was partly reduced following issue of the Mackenzie Valley Environmental Impact Review Board Report on Environmental Assessment and Reasons for Decision (REA), and the subsequent acceptance of the REA by the Minister of Lands. Dominion Diamond's assessment of the identified measures is that their implementation would not pose substantial risks to the project.
Conflict in the use of resources between Jay project construction and other projects.	Project delays and cost escalation.	Dominion would continue planning, cooperation, and communication among projects. Project plans include slack in infrastructure and support equipment, as well as adequate contingencies.	2016 early works program completed without significant resource conflicts with operations.
A lack of corporate experience in executing major projects at similar scales.	Project delays and cost escalation.	Dominion would retain experienced contractors, and is developing its internal project management capabilities and forming the Owner's team in advance of construction.	Sable Project construction has successfully started since Dominion's purchase of the operation. Corporate project execution experience continues to grow through cross-staffing and sharing of knowledge between projects.
A shortened winter road season during the construction phase.	Project delays.	Early planning would be completed to allow early staging and prioritization of equipment for transport on the Tibbitt to Contwoyto Winter Road. Other risk controls would include insurance, contractor selection, and potential use of heavy lift as backup.	2016 winter road mobilisation successfully completed despite shortened season.
Diamond size, quality, or grade that are lower than expected.	Reduction in expected revenue.	Bulk samples have been collected and analyzed.	Winter 2015 bulk sampling results incorporated into Jay Feasibility Study, approved in July 2016.
Appreciation of the Canadian dollar against the US dollar.	Variances in budgets, and/or reduced profitability.	Hedging of foreign exchange risk will be considered.	Dominion considering appropriate strategies to manage foreign exchange risk after Project approval.
Lower diamond prices	Reduction in expected revenue.	Key controls include marketing strategy and market monitoring.	Jay-specific marketing strategies in development.
Slope failure of the Jay Pit wall.	Loss of equipment, wall remediation and additional depressurization, disruption to the operations. Impact on operating costs. Potential for injuries.	Control measures include engineering design, field investigation, and geological mapping. Procedures for monitoring slope movement and pore water pressure would be	Additional field investigation completed in winter 2016.

Risk	Impact	Mitigation	Status (July 2016)
		implemented for the Project, along with a worker evacuation plan.	
Traffic accident.	Equipment damage. Potential for injuries.	Update and implement the current traffic management plan, including the requirement for operator certification, and the fatigue management plan within the Jay project area.	
Heavy vehicle traffic on Misery Road during operations.	Increased capital expenditure for haulage and road maintenance.	The project plan includes switching the haulage vehicles operating on Misery Road to higher payload road trains. Alternative road options, including road widening and bridge upgrades are also under consideration.	Paul Lake bridge upgrades underway in summer 2016. DPRT fleet gradually replacing smaller vehicles on Misery Road.
Reduction in processing plant throughput as a result of processing Jay ore.	Reduction in revenue.	Upgrades to the front end of the processing plant, geo-metallurgical test work, and blending Jay and Sable ore.	Engineering studies to evaluate processing plant upgrade options scheduled for 2017.
Expanded scope and cost of reclamation and closure to meet regulatory requirements.	Higher reclamation bonds and increased closure cost and timeline.	Update and optimize the Interim Closure and Reclamation Plan with the extended mine life and continue to engage the Wek'èezhìi Land and Water Board and others interested in the project on closure planning.	As part of the granting of the Jay Early Works Land Use Permit the Wek'èezhìi Land and Water Board set a reclamation security cost of $1.5 million is required before the commencement of the Jay Early Works construction (roads and pads). A proposed security estimate of $13.9 million for the remaining components of the proposed Jay Development have been provided Dominion. The proposed security estimate is undergoing review as part of the regulatory process for the Jay Type A Land Use Permit and amendment to the Ekati Type A Water Licence.

25.0 INTERPRETATION AND CONCLUSIONS

The QPs, as authors of this Report, have reviewed the data for the Ekati Project and have reached the following conclusions and interpretations in their areas of responsibility.

25.1 Mineral Tenure and Royalties

Mineral tenure is held under two joint venture agreements. The Ekati mining lease block currently comprises 281 mining leases. The Core JV includes 175 mining leases, totalling about 172,992 ha. The Buffer JV contains 106 mining leases (89,184 ha).

All mining leases were legally surveyed by licensed surveyors. Annual lease payment requirements have been met as they fall due.

A production royalty is payable to the Government.

25.2 Permits

Within the Ekati mineral leases, there are 10 surface leases, which provide tenure for operational infrastructure. All mine project developments are within these surface leases. All of the surface leases will expire in 2026. The Pigeon surface lease was renewed in December 2012, and now extends to 2026. The Sable lease was renewed in 2015 and now also extends to 2026. Section 10 of the Territorial Lands Regulations provides for the renewal of these surface leases for a further 30 year term with appropriate engagement with Aboriginal communities.

Additional permits will be required to support planned mining at the Jay pipe.

Dominion has three granted Type A land-use permits that cover the area of the Sable and Pigeon pits and the Sable haul road. Issue permits have a five-year term with a possible one-time extension of two years, which was requested and approved in 2014. All three land-use permits were renewed in 2016 until 2021.

Dominion is also a joint holder of three surface leases, one licence of occupation and one Land Use Permit for the winter road. These permits are managed by a Winter Road Joint Venture.

The Ekati Project has two Navigable Waters Protection Act Authorizations for structures interfering with navigation, and holds five fisheries authorizations which permit the mine to alter fish habitat in specified circumstances.

Dominion currently holds one water licence, which was issued by the Wek´èezhìi Land and Water Board. This licence provides for mining at all established areas plus allows for mining of the Pigeon, Lynx and Sable pipes. The licence is required to be renewed by August 2021.

Some of the permits granted to Ekati at the start of operations are nearing their expiry dates and must be renewed. In some cases, the legislation under which the permits were granted has been revised, or discharge/emissions standards have altered in the interim. In these instances it is possible that renewal of the permits will require modifications to existing practices so as to comply with the permit conditions that may be imposed by the appropriate regulator. While there is a reasonable expectation that the permits will be renewed, additional data collection or supporting studies on discharges/emissions may be required.

25.3 Environment and Social Licence

Dominion operates Ekati under an Environmental Agreement with the Government of Canada and the Government of the Northwest Territories that was concluded in 1997. The agreement is binding over the life-of-mine.

A number of environmental monitoring programs are in place, and include ongoing assessments of water quality, aquatic effects, fish habitat compensation measures, site reclamation projects, waste rock storage area seepage, wildlife effects, air quality, and geotechnical stability of engineered structures.

Compliance with environmental requirements and agreements is reported publicly on an annual basis through the Water Licence, Environmental Agreement, Fisheries Act Authorizations and other means.

Version 2.4 of the ICRP was approved by the Wek´èezhìi Land and Water Board in November 2011. Various updates to the ICRP have been approved through the Annual Reclamation Progress Report.

Dominion has sufficiently addressed the environmental impact of the operation, and subsequent closure and remediation requirements that Mineral Resources and Mineral Reserves can be estimated, and that the mine plan is appropriate and achievable. Monitoring programs are in place.

The Ekati Diamond Mine currently holds the appropriate social licenses to operate. Impact and Benefit Agreements were concluded with four Aboriginal communities.

25.4 Geology and Mineralization

The geological understanding of the settings, lithologies, and structural and alteration controls on mineralization in the different pipes is sufficient to support estimation of Mineral Resources and Mineral Reserves. The geological knowledge of the pipes is also considered sufficiently acceptable to reliably inform mine planning.

The mineralization style and setting is well understood and can support estimation of Mineral Resources and Mineral Reserves. The kimberlite pipes in the Ekati Project area display most of the typical features of kimberlite pipes. They are mostly small pipe-like bodies (surface area mostly <3 ha but up to 20 ha) that typically extend to projected depths of 400–600 m below the current land surface.

25.5 Exploration

The exploration programs completed to date are appropriate to the style of the deposit and prospects. The research work supports Dominion's genetic and affinity interpretations for the deposits.

25.6 Drilling

Core drilling is used to define the pipe contacts, wall-rock conditions, and internal geology but is not used for grade estimation. Core drilling is also used to obtain geotechnical and hydrogeological data. Diamonds for grade estimation and valuation are obtained by RC drilling and/or by bulk sampling in underground or open pit mines.

The quantity and quality of the lithological, geotechnical, density, collar and down hole survey data collected in the drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation.

25.7 Sampling

The density and spatial distribution of RC drill holes between pipes varies considerably and depends on a number of factors including pipe size, geologic complexity and grade characteristics relative to economic cut-offs.

Sampling methods are acceptable, meet industry-standard practices for diamond operations, and are acceptable for Mineral Resource and Mineral Reserve estimation and mine planning purposes.

Sampling error has the potential to cause over- or under-estimation of diamond grade. For both RC and drift bulk samples, it is typically not possible to measure fundamental grade sample error (e.g. check assays) as the entire sample is processed. The responsible QPs consider that the precision of the diamond weight estimates is high because concentrates are double picked by different qualified sorters and audits are undertaken on the double picked concentrates.

The quality of the analytical data is reliable and sample preparation, analysis, and security are generally performed in accordance with exploration best practices and industry standards.

25.8 Quality Assurance, Quality Control, and Data Verification

Regular data verification programs have been undertaken on the data collected from the Ekati Project. Findings of these programs acceptably support the geological interpretations and the database quality, and therefore support the use of the data in Mineral Resource and Mineral Reserve estimation, and in mine planning.

25.9 Metallurgical Test Work

Industry-standard studies were performed as part of process development and initial plant design. Subsequent production experience and focused investigations have guided plant expansions and process changes. Recovery estimates are based on appropriate metallurgical test work and confirmed with production data, and are appropriate to the stone frequency distributions for the various kimberlite domains.

The major geological parameter that can affect process plant performance is the presence of granite xenoliths in the plant feed. Typically, granite-containing feed is limited to 10% of the process throughput.

Feed with a high clay content can also result in poorer plant performance. Development of the Jay kimberlite will require careful attention to the quantities of sediments/fines and clay content in the plant feed.

25.10 Mineral Resource Estimates

Mineral Resources and Mineral Reserves are reported using the 2014 CIM Definition Standards.

Mineral Resources take into account geological, mining, processing and economic constraints, and have been defined within a conceptual stope design or a conceptual open pit shell. Depletion has been included in the estimates. No Measured Mineral Resources are estimated.

Factors which may affect the Mineral Resource estimates include: diamond book price and valuation assumptions; changes to geological interpretations; changes to the assumptions used to estimate the diamond carat content; conceptual block cave and open pit design assumptions; geotechnical, mining and process plant recovery assumptions; diamond parcel sizes for the pipes with estimates that are not in production or planned for production; and the effect of different sample-support sizes between RC drilling and underground sampling.

Two targets for additional exploration have been estimated, covering the coarse reject tails that have been stockpiled at Ekati since the start of production in 1998, and the Misery Deep area.

25.11 Mineral Reserve Estimates

Mineral Reserves were estimated for the Koala, Pigeon, Misery Main, Sable, Lynx and Jay pipes, and for stockpile materials.

Factors which may affect the Mineral Reserve estimates include diamond price assumptions; grade model assumptions, underground mine design, open pit mine design, geotechnical, mining and process plant recovery assumptions, practical control of dilution, changes to capital and operating cost estimates and variations to the permitting, operating or social license regime assumptions, in particular if permitting parameters are modified by regulatory authorities during permit renewals.

25.12 Mining Recovery

Underground and open pit mine plans are appropriately developed to maximize mining efficiencies, based on the current knowledge of geotechnical, hydrogeological, mining and processing information on the Ekati Diamond Mine. The predicted mine life to 2034 in the Mineral Reserves Base Case Mine Plan is achievable based on the projected annual production rate and the Mineral Reserves estimated. There is project upside potential if some or all of the mineralization that is in Mineral Resources that has not been converted to Mineral Reserves can be demonstrated with appropriate studies to support such conversion.

The equipment and infrastructure requirements required for life-of-mine operations are well understood. Conventional mining equipment is, and will continue to be used to support the mining activities. The fleet requirements are appropriate to the planned production rate and methods outlined in the mine plan.

25.13 Process Recovery

The Ekati processing plant had an original design capacity of 9,000 dmt/d. Through various efficiency improvements, the current capacity and budgeted operating rate is 10,800 dmt/d.

The process plant was not operating as of end July, 2016 due to a disruption in late June 2016. Plant remediation activities are in progress and the process plant is scheduled to resume full production by early October.

There are 18 years of production history that allow for a reasonable assessment of plant performance in a production setting. There are no data or assumptions in the Mineral Reserves mine plan that are significantly different from previous plant operating experience, previous production throughputs and recoveries, or the Ekati Project background history.

The metallurgical process is conventional for the diamond industry. DMS and X-ray are the primary methods of extracting diamonds from processed kimberlite.

The current process facilities are appropriate, and the existing process facilities will support the current life-of-mine plan.

As there are a number of kimberlite sources being treated, the plant will produce variations in recovery due to changes in kimberlite type and domains being processed. These variations are expected to trend to the forecast recovery value for quarterly or longer reporting periods. Granite, clay and tramp metal can cause issues with plant performance.

Processing of the Jay kimberlite will require minor modifications to the process plant.

Reagent consumptions and process conditions are based on both test work and production data. The operating costs associated with these factors are considered appropriate given the nature of the kimberlites to be processed.

25.14 Infrastructure

Ekati is an operating mine and key infrastructure on site includes the open pits, underground mines, sample and process plants, waste rock storage and processed kimberlite storage facilities, buildings (mobile and permanent), pipelines, pump stations, electrical systems, quarry site, camp pads and laydowns, ore storage pads, roads, culverts and bridges, airstrip, helipad, and mobile equipment.

To support the new fleet of larger trucks, a two-bay fabric maintenance facility will be constructed at Sable, and a four-bay fabric maintenance facility will be constructed at the Misery camp in support of Jay operations. To support the expanded DPRT fleet, a DPRT-specific maintenance facility will be constructed at the main Ekati camp. A secondary weld shop will also be established at Misery.

Two waste rock storage areas are planned for Sable, and one for Jay.

The existing and planned infrastructure, availability of staff, the existing power, water, and communications facilities, the methods whereby goods are transported to the mine, and any planned modifications or supporting studies are sufficiently well-established, or the requirements to establish such, are well understood by Dominion, and can support the estimation of Mineral Resources and Mineral Reserves and the mine plan.

25.15 Markets

The pricing forecasts are based on assumptions provided by Dominion's marketing group and represent a best estimate, given there exists no forward market for rough diamonds to provide external long run pricing trends. Forecasts are considered acceptable to support the Mineral Reserves and mine plan assumptions.

25.16 Capital and Operating Costs

The operating and capital cost estimates are appropriate to the estimated Mineral Reserves and Mineral Reserves mine plan assumptions.

25.17 Economic Analysis

Using the assumptions detailed in this Report, the Ekati Diamond Mine has positive economics until the end of the mine life.

The results of a sensitivity analysis demonstrated that the Ekati Diamond Mine is most sensitive to variations in exchange rate, diamond parcel valuations and diamond grades, less sensitive to fluctuations in operating costs, and least sensitive to changes in the capital cost assumptions.

25.18 Conclusions

In the opinion of the responsible QPs, the Ekati Project that is outlined in this Report has met its objectives.

Mineral Resources and Mineral Reserves have been estimated, a mine has been constructed, mining and milling operations are performing as expected, and reconciliation between mine production and the Mineral Resource model is acceptable. This indicates the data supporting the Mineral Resource and Mineral Reserve estimates were appropriately collected, evaluated and estimated, and the original objective of identifying mineralization that could support mining operations has been achieved.

The Ekati Project retains upside potential for mine-life extensions.

25.19 Risks and Opportunities

The Ekati Diamond Mine is a long-established operation with a clear understanding of challenges facing Dominion in exploiting the kimberlite pipes. The following risks and opportunities are noted.

25.19.1 Risks

Risks that can affect the mining operations, mine plan, recovery, environmental, social licence and permitting assumptions and therefore the Mineral Reserve estimates include mud rushes and geotechnical conditions that could cause pit wall or dike failures, diamond pricing forecasts, fuel prices, environmental compliance requirements that may become cost or permit prohibitive, and non-renewal of surface leases or permits.

25.19.2 Opportunities

Mineral Resources that are not included in either the current Mineral Reserve Base Case Mine Plan or the Operating Case Mine Plan include a portion of Koala underground, Misery Deep and Fox Deep. Of these deposits, Misery Deep represents the most significant opportunity, due to its high estimated diamond grade, potential for development below the existing open pit, and advanced permitting.

The Misery satellite pipes and the coarse reject tails, together with these Mineral Resources, along with additional levels at the Koala underground, represent future plant feed upside potential, and some or all of this mineralization may be able to be incorporated in the life-of-mine plan once sufficient additional work has been undertaken to support estimation of higher-confidence Mineral Resources and eventual conversion to Mineral Reserves.

There is also potential to treat low-grade stockpiles, primarily derived from open pit mining at the Fox kimberlite if the grades in the stockpiles can be demonstrated to be economic.

26.0 RECOMMENDATIONS

26.1 Introduction

A single phase work program is recommended as follows. No portion of the different work programs are dependent on the results of completion of another.

The program recommendations total approximately $10 million. All budget recommendation amounts are in Canadian dollars.

26.2 Current Operations

For the current operations (Misery pushback pit and the Lynx pit) the following work should be conducted:

- Carry out diamond drilling program for the Misery Main kimberlite to improve geological information, microdiamond grade estimates and geotechnical data for accessing the potential for mining below the current ultimate depth limit for the Misery pushback pit (estimated cost = $1,500,000);
- An updated resource estimate for the Misery Main kimberlite should be completed incorporating the new drilling information (estimated program cost = $50,000);
- Complete trade-off study for two mining methods to access Misery deep kimberlite (estimated cost = $100,000);
- A revised resource estimate for the Pigeon kimberlite utilizing the stone distribution methodology and incorporating the June 2016 production trial price data (estimated cost = $50,000);
- Complete production trial and bulk sample testing at the Lynx pit to improve diamond price estimate and to assess grade model (estimated cost = $200,000).

The overall cost estimate for the work recommended for the current operations totals approximately $1.9 million.

26.3 Sable

For the Sable project the following work should be conducted:

- Complete additional infill geotechnical drilling to finalize the pit design prior to mining (estimated cost = $1,600,000).

The overall cost estimate for the work recommended for the Sable project totals approximately $1.6 million.

26.4 Jay

For the Jay project the following work should be conducted:

- Confirmatory geotechnical drilling should be completed along the dike alignment to infill areas of greater uncertainty prior to dike construction (estimated cost = $2,400,000)

- Additional infill geotechnical drilling should also be completed to finalize the pit design prior to mining (estimated cost = $2,700,000).

The overall cost estimate for the work recommended for the Jay project totals approximately $5.1 million.

26.5 Fox Deep

In support of estimating Mineral Resources for the Fox Deep zone, the following work program is recommended:

- Complete sample processing and analysis for RC samples collected in winter 2016 (estimated cost = $500,000);
- Update Fox resource block model (estimated cost = $50,000);
- Complete scoping study for large scale underground development (estimated cost = $250,000).

The estimated total cost for this proposed work program for the Fox Deep zone is approximately $800,000.

26.6 Process Plant

Additional work is recommended to be undertaken in relation to the Ekati process plant, as follows:

- Carry out capital studies to improve the ability of the front-end of the process plant to handle high clay content material (estimated cost = $600,000).

The estimated total cost for this proposed work program for the process plant is approximately $600,000.

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Appendix A

Mining Leases

Core Zone Mining Leases

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3473	B 13	1996 Apr 10	2017 Apr 10	2,597.4	1,051.1	076D10	
3474	B 14	1996 Apr 10	2017 Apr 10	2,369.7	959.0	076D10	
3475	B 15	1996 Apr 10	2017 Apr 10	2,420.8	979.7	076D10	
3476	B 16	1996 Apr 10	2017 Apr 10	2,473.6	1,001.0	076D10	
3477	B 17	1996 Apr 10	2017 Apr 10	2,600.6	1,052.4	076D10	
3478	B 18	1996 Apr 10	2017 Apr 10	2,342.5	948.0	076D10	076D09
3479	A 13	1996 Apr 10	2017 Apr 10	2,377.1	962.0	076D10	
3480	A 14	1996 Apr 10	2017 Apr 10	2,517.8	1,018.9	076D10	
3481	A 15	1996 Apr 10	2017 Apr 10	2,417.7	978.4	076D10	
3482	A 16	1996 Apr 10	2017 Apr 10	2,462.0	996.3	076D10	
3483	A 17	1996 Apr 10	2017 Apr 10	2,417.9	978.5	076D10	
3484	A 18	1996 Apr 10	2017 Apr 10	2,474.0	1,001.2	076D10	076D09
3488	T 13	1996 Apr 10	2017 Apr 10	2,544.8	1,029.8	076D10	
3489	T 14	1996 Apr 10	2017 Apr 10	2,523.2	1,021.1	076D10	
3490	T 15	1996 Apr 10	2017 Apr 10	2,419.2	979.0	076D10	
3491	T 16	1996 Apr 10	2017 Apr 10	2,544.4	1,029.7	076D10	
3492	T 17	1996 Apr 10	2017 Apr 10	2,420.7	979.6	076D10	
3493	T 18	1996 Apr 10	2017 Apr 10	2,607.2	1,055.1	076D10	076D09
3494	T 19	1996 Apr 10	2017 Apr 10	2458.6	994.9	076D09	
3495	T 20	1996 Apr 10	2017 Apr 10	2464.4	997.3	076D09	
3496	B 19	1996 Apr 10	2017 Apr 10	2,494.0	1,009.3	076D09	076D10
3497	B 20	1996 Apr 10	2017 Apr 10	2,510.9	1,016.1	076D09	
3498	B 21	1996 Apr 10	2017 Apr 10	2,593.4	1,049.5	076D09	
3499	B 22	1996 Apr 10	2017 Apr 10	2,303.5	932.2	076D09	
3500	B 23	1996 Apr 10	2017 Apr 10	2,359.4	954.8	076D09	
3501	B 24	1996 Apr 10	2017 Apr 10	2,509.7	1,015.6	076D09	
3502	B 25	1996 Apr 10	2017 Apr 10	2,504.1	1,013.4	076D09	
3507	E 26	1996 Apr 10	2017 Apr 10	1,102.1	446.0	076D09	
3508	E 27	1996 Apr 10	2017 Apr 10	803.1	325.0	076D09	
3509	E 28	1996 Apr 10	2017 Apr 10	2,360.7	955.3	076D09	
3513	E 24	1996 Apr 10	2017 Apr 10	2,411.7	976.0	076D09	
3514	E 25	1996 Apr 10	2017 Apr 10	2,537.7	1,027.0	076D09	
3518	C 14	1996 Apr 10	2017 Apr 10	2512.0	1016.6	076D15	076D10
3519	C 15	1996 Apr 10	2017 Apr 10	2383.5	964.6	076D15	076D10
3520	C 16	1996 Apr 10	2017 Apr 10	2463.1	996.8	076D15	076D10
3521	C 17	1996 Apr 10	2017 Apr 10	2503.9	1013.3	076D15	076D10
3522	C 18	1996 Apr 10	2017 Apr 10	2377.5	962.2	076D15	076D10
3589	M 17	1997 Jun 26	2018 Jun 26	2,424.3	981.1	076D15	

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3590	M 18	1997 Jun 26	2018 Jun 26	2,405.4	973.4	076D15	076D16
3591	M 19	1997 Jun 26	2018 Jun 26	2,499.7	1,011.6	076D16	
3592	D 16	1997 Jun 26	2018 Jun 26	2,379.6	963.0	076D15	
3593	D 17	1997 Jun 26	2018 Jun 26	2591.6	1048.8	076D15	
3594	D 18	1997 Jun 26	2018 Jun 26	2452.6	992.5	076D15	076D16
3595	W 15	1997 Jun 26	2018 Jun 26	2404.8	973.2	076D15	
3596	W 16	1997 Jun 26	2018 Jun 26	2524.7	1021.7	076D15	
3597	W 17	1997 Jun 26	2018 Jun 26	2446.3	990.0	076D15	
3848	D19	1999 Aug 16	2020 Aug 16	2,577.9	1,043.3	076D16	
3803	W 12	1999 Nov 05	2020 Nov 05	2334.3	944.7	076D15	
3804	W 13	1999 Nov 05	2020 Nov 05	2665.0	1078.5	076D15	
3805	W 14	1999 Nov 05	2020 Nov 05	2395.6	969.5	076D15	
3806	C 3	1999 Nov 05	2020 Nov 05	2,495.3	1,009.8	076D14	076D11
3849	D20	1999 Nov 05	2020 Nov 05	1,841.8	745.3	076D16	
3850	D21	1999 Nov 05	2020 Nov 05	1,915.3	775.1	076D16	
3851	D22	1999 Nov 05	2020 Nov 05	2,025.5	819.7	076D16	
3852	D23	1999 Nov 05	2020 Nov 05	2,019.4	817.2	076D16	
3853	D24	1999 Nov 05	2020 Nov 05	1,969.1	796.9	076D16	
3854	F15	1999 Nov 05	2020 Nov 05	2,442.1	988.3	076D15	
3855	F16	1999 Nov 05	2020 Nov 05	2,457.8	994.6	076D15	
3856	F17	1999 Nov 05	2020 Nov 05	2,598.2	1,051.4	076D15	
3807	T 12	1999 Nov 17	2020 Nov 17	2,517.2	1,018.7	076D10	
3808	C 8	1999 Nov 17	2020 Nov 17	2488.3	1007.0	076D15	076D10
3809	C 9	1999 Nov 17	2020 Nov 17	2408.8	974.8	076D15	076D10
3810	C 10	1999 Nov 17	2020 Nov 17	2396.5	969.8	076D15	076D10
3811	C 11	1999 Nov 17	2020 Nov 17	2427.6	982.4	076D15	076D10
3812	C 12	1999 Nov 17	2020 Nov 17	2395.7	969.5	076D15	076D10
3813	C 13	1999 Nov 17	2020 Nov 17	2558.2	1035.3	076D15	076D10
3814	A 8	1999 Nov 17	2020 Nov 17	2,305.9	933.2	076D10	
3815	A 9	1999 Nov 17	2020 Nov 17	2,510.5	1,015.9	076D10	
3816	A 10	1999 Nov 17	2020 Nov 17	2,264.3	916.3	076D10	
3817	A 11	1999 Nov 17	2020 Nov 17	2,557.1	1,034.8	076D10	
3818	A 12	1999 Nov 17	2020 Nov 17	2,453.3	992.8	076D10	
3819	A 2	1999 Nov 17	2020 Nov 17	2531.0	1024.2	076D11	
3820	A 3	1999 Nov 17	2020 Nov 17	2,391.9	968.0	076D11	
3821	A 4	1999 Nov 17	2020 Nov 17	2,609.2	1,055.9	076D11	
3822	T 2	1999 Nov 17	2020 Nov 17	2,584.3	1,045.8	076D11	
3823	T 5	1999 Nov 17	2020 Nov 17	2,362.7	956.2	076D14	
3824	W 18	1999 Nov 17	2020 Nov 17	2337.3	945.9	076D15	076D16
3825	W 19	1999 Nov 17	2020 Nov 17	2,457.7	994.6	076D16	
3826	W 20	1999 Nov 17	2020 Nov 17	2,503.5	1,013.1	076D16	

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3827	W 21	1999 Nov 17	2020 Nov 17	2,369.7	959.0	076D16	
3828	W 22	1999 Nov 17	2020 Nov 17	2,441.9	988.2	076D16	
3829	W 23	1999 Nov 17	2020 Nov 17	2,450.0	991.5	076D16	
3830	W 24	1999 Nov 17	2020 Nov 17	2,459.6	995.4	076D16	
3831	W 2	1999 Nov 17	2020 Nov 17	2,559.2	1,035.7	076D14	
3832	W 3	1999 Nov 17	2020 Nov 17	2452.0	992.3	076D14	
3833	W 4	1999 Nov 17	2020 Nov 17	2266.0	917.0	076D14	
3834	W 5	1999 Nov 17	2020 Nov 17	2542.7	1029.0	076D14	
3835	W 6	1999 Nov 17	2020 Nov 17	2417.9	978.5	076D14	
3836	W 7	1999 Nov 17	2020 Nov 17	2446.3	990.0	076D14	076D15
3837	W 8	1999 Nov 17	2020 Nov 17	2525.1	1021.9	076D15	
3857	M14	1999 Nov 17	2020 Nov 17	2,528.3	1,023.2	076D15	
3858	M15	1999 Nov 17	2020 Nov 17	2,482.6	1,004.7	076D15	
3859	M16	1999 Nov 17	2020 Nov 17	2,457.1	994.4	076D15	
3860	T21	1999 Nov 17	2020 Nov 17	2,570.1	1,040.1	076D09	
3861	T22	1999 Nov 17	2020 Nov 17	2,338.8	946.5	076D09	
3862	T23	1999 Nov 17	2020 Nov 17	2,510.6	1,016.0	076D09	
3863	T24	1999 Nov 17	2020 Nov 17	2,490.4	1,007.8	076D09	
3864	A19	1999 Nov 17	2020 Nov 17	2,371.1	959.5	076D09	076D10
3865	A20	1999 Nov 17	2020 Nov 17	2,646.0	1,070.8	076D09	
3866	A21	1999 Nov 17	2020 Nov 17	2,422.3	980.3	076D09	
3867	A22	1999 Nov 17	2020 Nov 17	2,458.7	995.0	076D09	
3868	A23	1999 Nov 17	2020 Nov 17	2,535.1	1,025.9	076D09	
3869	A24	1999 Nov 17	2020 Nov 17	2,353.5	952.4	076D09	
3870	C19	1999 Nov 17	2020 Nov 17	2501.8	1012.5	076D16	076D09
3871	C20	1999 Nov 17	2020 Nov 17	2467.9	998.7	076D16	076D09
3872	C21	1999 Nov 17	2020 Nov 17	2347.6	950.1	076D16	076D09
3873	C22	1999 Nov 17	2020 Nov 17	2390.4	967.3	076D16	076D09
3874	C23	1999 Nov 17	2020 Nov 17	2503.9	1013.3	076D16	076D09
3875	C24	1999 Nov 17	2020 Nov 17	2427.1	982.2	076D16	076D09
3876	D14	1999 Nov 17	2020 Nov 17	2,396.6	969.9	076D15	
3877	D15	1999 Nov 17	2020 Nov 17	2,528.7	1,023.3	076D15	
3895	W9	2000 Jun 02	2021 Jun 02	2475.6	1001.8	076D15	
3896	W10	2000 Jul 17	2021 Jul 17	2565.9	1038.4	076D15	
3897	W11	2000 Jun 02	2021 Jun 02	2535.3	1026.0	076D15	
3898	A5	2000 Jun 02	2021 Jun 02	2,340.0	947.0	076D11	
3899	A6	2000 Jun 02	2021 Jun 02	2,508.1	1,015.0	076D11	
3900	A7	2000 Jun 02	2021 Jun 02	2,464.1	997.2	076D11	
3901	C4	2000 Jun 02	2021 Jun 02	2,554.2	1,033.7	076D14	076D11
3902	C5	2000 Jun 02	2021 Jun 02	2,496.0	1,010.1	076D14	076D11
3903	C6	2000 Jun 02	2021 Jun 02	2,390.7	967.5	076D14	076D11

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3904	C7	2000 Jun 02	2021 Jun 02	2,498.9	1,011.3	076D14	076D11
3905	T4	2000 Jun 02	2021 Jun 02	2,530.7	1,024.1	076D11	
3906	A25	2000 Jun 02	2021 Jun 02	2,542.8	1,029.0	076D09	
3907	T25	2000 Jun 02	2021 Jun 02	2,435.8	985.7	076D09	
3908	D3	2000 Jun 02	2021 Jun 02	2,620.0	1,060.3	076D14	
3909	D4	2000 Jun 02	2021 Jun 02	2,496.7	1,010.4	076D14	
3910	D5	2000 Jun 02	2021 Jun 02	2,494.2	1,009.4	076D14	
3911	D6	2000 Jun 02	2021 Jun 02	2,484.3	1,005.4	076D14	
3912	D7	2000 Jun 02	2021 Jun 02	2,288.1	926.0	076D14	076D15
3913	M8	2000 Jun 02	2021 Jun 02	2,328.2	942.2	076D15	
3914	M9	2000 Jun 02	2021 Jun 02	2,508.6	1,015.2	076D15	
3915	M10	2000 Jun 02	2021 Jun 02	2,384.5	965.0	076D15	
3916	M11	2000 Jun 02	2021 Jun 02	2,481.1	1,004.1	076D15	
3917	M12	2000 Jun 02	2021 Jun 02	2,486.9	1,006.4	076D15	
3918	M13	2000 Jun 02	2021 Jun 02	2,298.1	930.0	076D15	
3919	F11	2000 Jun 02	2021 Jun 02	2500.9	1012.1	076D15	
3920	F12	2000 Jun 02	2021 Jun 02	2,464.4	997.3	076D15	
3921	F13	2000 Jun 02	2021 Jun 02	2,427.8	982.5	076D15	
3922	F14	2000 Jun 02	2021 Jun 02	2,360.2	955.1	076D15	
3932	C2	2000 Jun 02	2021 Jun 02	2,646.0	1,070.8	076D14	076D11
3933	M21	2000 Jun 02	2021 Jun 02	2,422.7	980.4	076D16	
3934	M23	2000 Jun 02	2021 Jun 02	2,611.4	1,056.8	076D16	
3935	D8	2000 Jun 02	2021 Jun 02	2,651.6	1,073.1	076D15	
3936	D9	2000 Jun 02	2021 Jun 02	2,431.3	983.9	076D15	
3937	D10	2000 Jun 02	2021 Jun 02	2,305.9	933.2	076D15	
3938	D11	2000 Jun 02	2021 Jun 02	2,552.0	1,032.8	076D15	
3939	D12	2000 Jun 02	2021 Jun 02	2,499.7	1,011.6	076D15	
3940	D13	2000 Jun 02	2021 Jun 02	2,312.9	936.0	076D15	
3945	T6	2000 Jun 02	2021 Jun 02	2,579.4	1,043.8	076D14	
3946	T7	2000 Jun 02	2021 Jun 02	2,485.7	1,005.9	076D14	
3947	T8	2000 Jun 02	2021 Jun 02	2,633.0	1,065.5	076D10	
3948	T9	2000 Jun 02	2021 Jun 02	2,406.6	973.9	076D10	
3949	T10	2000 Jun 02	2021 Jun 02	2,494.3	1,009.4	076D10	
3950	T11	2000 Jun 02	2021 Jun 02	2,376.4	961.7	076D10	
3951	C1	2000 Jun 02	2021 Jun 02	2,654.9	1,074.4	076D14	076D11
3952	C101	2000 Jun 02	2021 Jun 02	2,569.6	1,039.9	076D14	076D11
3953	C25	2000 Jun 02	2021 Jun 02	2,587.0	1,046.9	076D16	076D09
3954	D25	2000 Jun 02	2021 Jun 02	2,139.6	865.9	076D16	
3955	W25	2000 Jun 02	2021 Jun 02	2,652.7	1,073.5	076D16	
3956	D1	2000 Jun 02	2021 Jun 02	2,596.3	1,050.7	076D14	
3957	D2	2000 Jun 02	2021 Jun 02	2,577.6	1,043.1	076D14	

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3958	D101	2000 Jun 02	2021 Jun 02	2371.5	959.7	076D14	
3959	E29	2000 Jun 02	2021 Jun 02	2,476.0	1,002.0	076D09	
3960	T3	2000 Jun 02	2021 Jun 02	2,384.3	964.9	076D11	
3961	W1	2000 Jun 02	2021 Jun 02	2,665.2	1,078.6	076D14	
3962	W101	2000 Jun 02	2021 Jun 02	2,536.8	1,026.6	076D14	
3963	M20	2000 Jun 02	2021 Jun 02	2,497.7	1,010.8	076D16	
3964	M22	2000 Jun 02	2021 Jun 02	2,658.4	1,075.8	076D16	
3965	M24	2000 Jun 02	2021 Jun 02	2,526.8	1,022.6	076D16	
3966	M101	2000 Jun 02	2021 Jun 02	2,732.0	1,105.6	076D14	
3967	M2	2000 Jun 02	2021 Jun 02	2,658.1	1,075.7	076D14	
3968	M3	2000 Jun 02	2021 Jun 02	2,456.1	993.9	076D14	
3969	M25	2000 Jun 02	2021 Jun 02	2,629.5	1,064.1	076D16	
3970	M6	2000 Jun 02	2021 Jun 02	2,487.3	1,006.6	076D14	
3971	M7	2000 Jun 02	2021 Jun 02	2,473.9	1,001.2	076D14	

TOTAL	***175 Mining Leases in Core Zone***	***427,472.3 acres***	***172,991.9 hectares***

Buffer Zone Mining Leases

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3485	ED 52	1996 Apr 10	2017 Apr 10	2,485.5	1,005.9	076D09	
3486	ED 53	1996 Apr 10	2017 Apr 10	2,524.5	1,021.6	076D09	
3487	ED 54	1996 Apr 10	2017 Apr 10	1,459.4	590.6	076D09	
3503	ED 69	1996 Apr 10	2017 Apr 10	1,045.2	423.0	076D09	
3504	ED 70	1996 Apr 10	2017 Apr 10	1,677.8	679.0	076D09	
3505	ED 26	1996 Apr 10	2017 Apr 10	2,497.3	1,010.6	076D09	
3506	ED 66	1996 Apr 10	2017 Apr 10	1,262.9	511.1	076D09	
3510	ED 20	1996 Apr 10	2017 Apr 10	2,653.1	1,073.7	076D09	
3511	ED 21	1996 Apr 10	2017 Apr 10	2,402.6	972.3	076D09	
3512	ED 22	1996 Apr 10	2017 Apr 10	2,698.7	1,092.1	076D09	
3515	ED 23	1996 Apr 10	2017 Apr 10	1,560.2	631.4	076D09	
3516	ED 24	1996 Apr 10	2017 Apr 10	1,598.3	666.0	076D09	
3517	ED 25	1996 Apr 10	2017 Apr 10	1,100.3	445.3	076D09	
3941	ED68	2001 Jul 27	2022 Jul 27	1,947.4	788.1	076C12	076D09
3942	ED72	2001 Jul 27	2022 Jul 27	981.5	397.2	076D09	076C12
3943	ED64	2001 Jul 27	2022 Jul 27	1,639.4	663.4	076C12	
3975	ED67	2001 Jul 27	2022 Jul 27	2,200.8	890.6	076D09	
3976	ED71	2001 Jul 27	2022 Jul 27	2,238.6	905.9	076D09	
3979	ED28	2001 Jul 27	2022 Jul 27	2,414.3	977.0	076C12	076D09
3981	ED74	2001 Jul 27	2022 Jul 27	2,646.0	1,070.8	076D09	
3982	ED75	2001 Jul 27	2022 Jul 27	2,372.7	960.2	076D09	
3983	GO4	2001 Jul 27	2022 Jul 27	2,604.5	1,054.0	076D16	
3984	GO5	2001 Jul 27	2022 Jul 27	2,501.0	1,012.1	076D16	
3986	ED76	2001 Jul 27	2022 Jul 27	1,995.9	807.7	076D09	
3987	ED77	2001 Jul 27	2022 Jul 27	2,031.7	822.2	076D09	
3988	ED78	2001 Jul 27	2022 Jul 27	2,045.2	827.7	076D09	
3989	ED62	2001 Jul 27	2022 Jul 27	1,497.2	605.9	076D09	
3990	ED63	2001 Jul 27	2022 Jul 27	1,607.5	650.5	076C12	076D09
4028	ED58	2001 Jul 27	2022 Jul 27	2,064.8	835.6	076C12	
4029	ED56	2001 Jul 27	2022 Jul 27	2,365.2	957.2	076D09	
4030	ED57	2001 Jul 27	2022 Jul 27	2,617.0	1,059.0	076C12	076D09
4031	GO23	2001 Jul 27	2022 Jul 27	2,464.2	997.2	076D16	
4036	ED55	2001 Jul 27	2022 Jul 27	1,731.5	700.7	076D09	
4037	ED59	2001 Jul 27	2022 Jul 27	2,597.8	1,051.3	076D09	076C12
4038	ED60	2001 Jul 27	2022 Jul 27	2,841.2	1,149.8	076C12	076D09
4039	ED61	2001 Jul 27	2022 Jul 27	2,634.0	1,066.0	076C12	
3977	ED27	2001 Nov 01	2022 Nov 01	2,558.2	1,035.3	076D09	
3978	ED29	2001 Nov 01	2022 Nov 01	1,749.9	708.2	076C12	

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
3980	ED73	2001 Nov 01	2022 Nov 01	2,442.3	988.4	076D09	
3985	GO6	2001 Nov 01	2022 Nov 01	2,574.4	1,041.8	076D16	
3991	GO10	2001 Nov 01	2022 Nov 01	2,525.3	1,021.9	076D16	
3992	GO11	2001 Nov 01	2022 Nov 01	2,560.1	1,036.0	076D16	
3993	GO12	2001 Nov 01	2022 Nov 01	2,571.8	1,040.8	076D16	
4003	AM59	2001 Nov 01	2022 Nov 01	2,521.7	1,020.5	076D15	
4010	AM72	2001 Nov 01	2022 Nov 01	1,218.7	493.2	076D15	
4011	AM60	2001 Nov 01	2022 Nov 01	2,617.7	1,059.4	076D15	
4012	AM61	2001 Nov 01	2022 Nov 01	2,475.4	1,001.7	076D15	
4013	AM62	2001 Nov 01	2022 Nov 01	2,489.8	1,007.6	076D15	
4014	AM63	2001 Nov 01	2022 Nov 01	2,540.0	1,027.9	076D15	076D16
4015	AM64	2001 Nov 01	2022 Nov 01	1,788.2	723.7	076D16	
4016	AM73	2001 Nov 01	2022 Nov 01	1,334.2	539.9	076D15	
4017	AM74	2001 Nov 01	2022 Nov 01	1,260.2	510.0	076D15	
4018	AM75	2001 Nov 01	2022 Nov 01	1,222.6	494.7	076D15	
4019	AM76	2001 Nov 01	2022 Nov 01	1,331.8	539.0	076D15	076D16
4020	AM77	2001 Nov 01	2022 Nov 01	905.1	366.3	076D16	
4021	AM65	2001 Nov 01	2022 Nov 01	2,561.8	1,036.7	076D16	
4022	GO27	2001 Nov 01	2022 Nov 01	1,643.9	665.3	076D16	
4023	GO28	2001 Nov 01	2022 Nov 01	1,556.1	629.7	076D16	
4024	GO29	2001 Nov 01	2022 Nov 01	1,589.5	643.3	076D16	
4025	GO13	2001 Nov 01	2022 Nov 01	2,350.0	951.0	076D16	076D09
4026	GO14	2001 Nov 01	2022 Nov 01	2,611.9	1,057.0	076D16	076D09
4027	GO15	2001 Nov 01	2022 Nov 01	2,611.2	1,056.7	076D16	076D09
4032	GO22	2001 Nov 01	2022 Nov 01	2,500.0	1,011.7	076D16	
4033	GO24	2001 Nov 01	2022 Nov 01	2,359.3	954.8	076D16	
4034	GO30	2001 Nov 01	2022 Nov 01	2,418.0	978.5	076D16	
4035	GO31	2001 Nov 01	2022 Nov 01	2,439.7	987.3	076D15	076D16
4040	ED65	2001 Nov 01	2022 Nov 01	450.3	182.2	076C12	
4041	GO7	2001 Nov 01	2022 Nov 01	2,518.9	1,019.3	076D16	
4042	GO8	2001 Nov 01	2022 Nov 01	2,484.0	1,005.2	076D16	
4043	GO9	2001 Nov 01	2022 Nov 01	2,659.8	1,076.4	076D16	
4273	ED42	2001 Nov 16	2022 Nov 16	1,657.2	670.6	076D10	
4274	ED43	2001 Nov 16	2022 Nov 16	1,809.3	732.2	076D10	
4275	ED44	2001 Nov 16	2022 Nov 16	1,512.4	612.0	076D10	
4276	ED45	2001 Nov 16	2022 Nov 16	1,647.8	666.8	076D10	
4277	ED46	2001 Nov 16	2022 Nov 16	1,457.7	589.9	076D10	076D09
4281	ED11	2001 Nov 16	2022 Nov 16	2,634.2	1,066.0	076D10	
4282	ED12	2001 Nov 16	2022 Nov 16	2,494.3	1,009.4	076D10	
4287	ED9	2001 Nov 16	2022 Nov 16	2,561.5	1,036.6	076D10	
4288	ED10	2001 Nov 16	2022 Nov 16	2,532.5	1,024.8	076D10	

Mining Lease	Original Claim ID	Anniversary Date	Expiry Date	Area Acres	Area Hectares	NTS Sheet (main)	NTS Sheet (minor)
4289	ED40	2001 Nov 16	2022 Nov 16	1,591.9	644.2	076D10	
4290	ED41	2001 Nov 16	2022 Nov 16	1,682.1	680.7	076D10	
4351	GO16	2001 Nov 16	2022 Nov 16	1,662.8	672.9	076D16	
4352	GO17	2001 Nov 16	2022 Nov 16	1,711.9	692.8	076D16	
4353	GO18	2001 Nov 16	2022 Nov 16	1,601.4	648.1	076D16	
4354	GO25	2001 Nov 16	2022 Nov 16	1,630.9	660.0	076D16	
4355	GO26	2001 Nov 16	2022 Nov 16	1,657.2	670.6	076D16	
4356	GO1	2001 Nov 16	2022 Nov 16	2,659.9	1,076.4	076D16	
4357	GO2	2001 Nov 16	2022 Nov 16	2,502.6	1,012.7	076D16	
4358	GO19	2001 Nov 16	2022 Nov 16	2,380.7	963.4	076D16	
4359	GO20	2001 Nov 16	2022 Nov 16	2,484.8	1,005.6	076D16	
4360	GO21	2001 Nov 16	2022 Nov 16	2,586.0	1,046.5	076D16	
4361	ED47	2001 Nov 16	2022 Nov 16	1,939.3	784.8	076D09	
4362	ED48	2001 Nov 16	2022 Nov 16	1,450.5	587.0	076D09	
4363	ED49	2001 Nov 16	2022 Nov 16	1,642.8	664.8	076D09	
4364	ED50	2001 Nov 16	2022 Nov 16	1,543.6	624.7	076D09	
4365	ED51	2001 Nov 16	2022 Nov 16	1,554.0	628.9	076D09	
4366	ED13	2001 Nov 16	2022 Nov 16	2,510.8	1,016.1	076D10	
4367	ED14	2001 Nov 16	2022 Nov 16	2,378.9	962.7	076D10	
4368	ED15	2001 Nov 16	2022 Nov 16	2,609.3	1,056.0	076D10	
4369	ED16	2001 Nov 16	2022 Nov 16	2,310.0	934.8	076D10	
4370	ED17	2001 Nov 16	2022 Nov 16	2,773.7	1,122.5	076D10	076D09
4371	ED18	2001 Nov 16	2022 Nov 16	2,785.8	1,127.4	076D09	
4372	ED19	2001 Nov 16	2022 Nov 16	2,330.3	943.0	076D09	
4380	GO3	2001 Nov 16	2022 Nov 16	2,464.6	997.4	076D16	
4532	ED38	2001 Nov 16	2022 Nov 16	1,612.5	652.5	076D10	
4533	ED39	2001 Nov 16	2022 Nov 16	1,518.9	614.7	076D10	

TOTALS	***106 Mining Leases in Buffer Zone***	***220,330.6 acres***	***89,183.8 hectares***