Macassa Property, Ontario, Canada

Updated NI 43-101 Technical Report

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Report Addressed to Kirkland Lake Gold

Important Notice

This Technical Report has been prepared as a National Instrument 43-101 Technical Report, as prescribed in Canadian Securities Administrators' National Instrument 43-101, Standards of Disclosure for Mineral Projects (NI 43-101) for Kirkland Lake Gold Ltd. (KLG). The data, information, estimates, conclusions and recommendations contained herein, as prepared and presented by the Authors, are consistent with: the information available at the time of preparation; the data supplied by outside sources, which has been verified by the authors as applicable; and the assumptions, conditions and qualifications set forth in this Technical Report.

Cautionary Note with Respect to Forward-Looking Information

Certain information and statements contained in this Technical Report are "forward looking" in nature. All information and statements in this report, other than statements of historical fact, that address events, results, outcomes or developments that Kirkland Lake Gold Ltd. and/or the Qualified Persons who authored this report expect to occur are "forward-looking statements". Forward looking statements are statements that are not historical facts and are generally, but not always, identified by the use of forward-looking terminology such as "plans", "expects", "is expected", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates", "projects", "potential", "believes" or variations of such words and phrases or statements that certain actions, events or results "may", "could", "would", "should", "might" or "will be taken", "occur" or "be achieved" or the negative connotation of such terms.

Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause actual results, performance or achievements to be materially different from any of its future results, performance or achievements expressed or implied by forward-looking statements. These risks, uncertainties and other factors include, but are not limited to, assumptions and parameters underlying the life of mine update not being realized, a decrease in the future gold price, discrepancies between actual and estimated production, changes in costs (including labour, supplies, fuel and equipment), changes to tax rates; environmental compliance and changes in environmental legislation and regulation, exchange rate fluctuations, general economic conditions and other risks involved in the gold exploration and development industry, as well as those risk factors discussed in the Technical Report. Such forward-looking statements are also based on a number of assumptions which may prove to be incorrect, including, but not limited to, assumptions about the following: the availability of financing for exploration and development activities; operating and capital costs; the Company's ability to attract and retain skilled staff; sensitivity to metal prices and other sensitivities; the supply and demand for, and the level and volatility of the price of, gold; the supply and availability of consumables and services; the exchange rates of the Canadian dollar to the U.S. dollar; energy and fuel costs; the accuracy of reserve and resource estimates and the assumptions on which the reserve and resource estimates are based; market competition; ongoing relations with employees and impacted communities and general business and economic conditions. Accordingly, readers should not place undue reliance on forward-looking statements. The forward-looking statements contained herein are made as of the date hereof, or such other date or dates specified in such statements.

All forward-looking statements in this Technical Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Kirkland Lake Gold Ltd. and the

Qualified Persons who authored this report undertake no obligation to update publicly or otherwise revise any forward-looking statements contained herein whether as a result of new information or future events or otherwise, except as may be required by law.

Non-IFRS Financial Performance Measures

Kirkland Lake Gold has included a non-IFRS measure “total site costs”, “total site costs per ounce” and various unit costs in this Technical Report. The Company believes that these measures, in addition to conventional measures prepared in accordance with IFRS, provide investors an improved ability to evaluate the underlying performance of the Company. The non-IFRS measures are intended to provide additional information and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with IFRS. These measures do not have any standardized meaning prescribed under IFRS, and therefore may not be comparable to other issuers.

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SUMMARY

This National Instrument 43-101 Technical Report (Technical Report) was triggered by the disclosure from KLG of its Annual Information Form (AIF) for the year 2016 (section 4.2 (1) (f) of the Instrument).

This Technical Report has been prepared for KLG, the beneficial owner of the Macassa Mine. KLG is listed on the Toronto Stock Exchange under the ticker symbol “KL”. This Technical Report provides the Mineral Resource and Mineral Reserve (MRMR) estimates for the Macassa Mine that have resulted from ongoing exploration and resource definition drilling and as a result of ongoing mine design and evaluation during the period January 1, 2016 to December 31, 2016.

The Macassa Mine is located in the Municipality of Kirkland Lake, Teck Township, District of Timiskaming, Ontario, Canada, at approximately 48°10’ N Latitude and 80°2’ W Longitude, approximately 600 km north of Toronto.

The Macassa Mine went through numerous owners since it started in 1933. Operations were suspended in 1999 due to depressed gold price and the mine was flooded in 2000. Underground mining restarted in 2002. The property consists of 253 mining claims in the Teck and Lebel Townships that covers 4,035 hectares (186 patented claims, 11 crown leases and 56 staked claims).

The Kirkland Lake mining camp is located in the west portion of the Archean Abitibi greenstone belt of the Abitibi Sub-province that forms part of the Superior Province in the Precambrian Shield.

The Macassa deposit is hosted within the Timiskaming Group of rocks, which is approximately 3.2 km and stretches from Kenogami Lake to the Quebec border. Host rocks are predominantly conglomerates and sandstones, trachytic lava flows and pyroclastic tuffs trending N65°E and dipping steeply to the south at Kirkland Lake. Gold mineralization occurs preferentially in the syenites. The Kirkland Lake-Larder Lake Break, and its associated splay faults and fracture system, form a complex, major structural feature that can be traced from Matachewan (west of Kirkland Lake) to Louvicourt (Quebec). It passes through, or near, current and historical mining areas, such as: Larder Lake, Rouyn-Noranda, Cadillac, Malartic, Val d’Or and Louvicourt.

The Macassa Mine is hosted in a fault system located north of the main Kirkland Lake-Larder Lake Break, as individual fracture fill quartz veins from several centimetres to a few metres. Historical workings at Macassa indicated that gold was often associated with 1% to 3% pyrite and, sometimes, molybdenite or tellurides. Silver is both amalgamated with the gold and in tellurides. Pyrite and silicification does not always

guarantee the presence of gold, but higher grade ore is almost always accompanied by increased percentages of pyrite and silica.

The SMC Zone, located to the south of the Main Break and the ’04 Break, reveals a different style of mineralization that includes wide sulphide systems instead of quartz vein mineralization. Tellurides appear to be more prevalent in the SMC (e.g. Calaverite).

KLG’s exploration program will be directed at expanding the potential of the SMC zones along strike (to the eastern boundary of the Property) and dip, and continue to explore the Amalgamated Break Trend through surface exploration.

Access to the mining areas is by #3 Shaft and various lateral development headings within the ’04 Break, Main Break and SMC zones. Main mining method includes longhole stoping, mechanized overhand cut and fill, and underhand cut and fill. Various materials are available for backfilling stopes: waste rock, cemented rock fill and paste fill. Ore (and some waste) is hoisted to surface via #3 Shaft, which has an average capacity of 2,200 tpd.

After crushing and grinding (95% passing 44 microns), the ore is processed by conventional cyanide leaching with a carbon-in-pulp recovery system. The mill capacity is 2,000 tpd and average recovery is approximately 97%.

The updated (MRMR), as of December 31, 2016, are presented in Summary Table 1 and Summary Table 2, respectively.

	Measured			**Indicated**			**Measured + Indicated**			**Inferred**		
	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)
Main / '04 Break	871	16.16	452	766	17.95	442	1,637	17	894	324	17.54	183
SMC	27	18.19	16	294	24.23	229	321	23.72	245	850	23.93	654
Other Zones	9	18.29	5	510	10.85	178	519	10.98	183	248	11.06	88
Grand Totals	**907**	**16.24**	**473**	**1,570**	**16.82**	**849**	**2,477**	**16.61**	**1,322**	**1,422**	**20.23**	**925**

Notes
CIM definitions (2014) were followed in the estimation of Mineral Resource
Mineral Resources are reported Exclusive of Mineral Reserves
Mineral Resource estimates were prepared under the supervision of D. Cater, P. Geo.
Mineral Resources were estimated at a block cut-off grade of 8.57 g/t Au or 0.25 opt.
Mineral Resources are estimated using a gold price of C$1,500/oz
A minimum mining width of 1.83m or 6’ Horizontal Mining Width (“HMW” used on the ’04 Break) or 2.74m or 9’ Vertical Mining Height (“VMH” used on the SMC shallow dipping veins) was applied
A bulk density of 2.74 t/m^3 or 11.7 cu. ft. was used
Totals may not add exactly due to rounding

Summary Table 1: Mineral resources at Macassa Mine (as of Dec 31, 2016).

MACASSA MINE				
ZONE	**CATEGORY**	**TONNES**	**GRADE**	**OUNCES**
SMC	PROVEN	337,999	17.81	193,499
SMC	PROBABLE	2,076,118	22.63	1,510,457
MAIN BREAK	PROVEN	271,813	15.85	138,492
MAIN BREAK	PROBABLE	316,749	16.05	163,449
East End	PROVEN	0	0.00	0
East End	PROBABLE	0	0.00	0
Shaft Pillar	PROVEN	0	0.00	0
Shaft Pillar	PROBABLE	0	0.00	0
TOTAL	**PROVEN**	**609,812**	**16.93**	**331,990**
TOTAL	**PROBABLE**	**2,392,866**	**21.76**	**1,673,906**
TOTALS	**2 P'S**	**3,002,679**	**20.78**	**2,005,896**

Notes
CIM definitions (2014) were followed in the estimation of Mineral Reserves
Cut-off grades were calculated for each stope, unless noted otherwise
Mineral Reserves were estimated using a long-term gold price of US$1,200/oz (CDN$1,500/oz)
Mineral Reserves estimates were prepared under the supervision of P. Rocque, P. Eng.
Totals may not add exactly due to rounding

Summary Table 2: Mineral reserves at Macassa Mine (as of Dec 31, 2016).

Production activities at the Macassa Mine started in 1933. After a brief shutdown due to low gold prices in the early 200's, the mine re-opened and continue to produce gold from high grade ore.

The recent business transaction between Kirkland Lake Gold Inc. and Newmarket Inc. provided additional opportunities to further develop the Property supported by an increased in capital expenditures. In current gold price environment, the operation is expected to generate significant free cash flows that will benefit KLG's shareholders.

Main opportunities at the Macassa Mine are as follows:

- SMC mineralization remains open to the east, west and at depth. Diamond drilling continues to return high grade mineralization. That said, the 5300 Level exploration drift east with associated drill bays must be considered a high priority development heading at the mine.

- In 2017, the operation will transition from modified polygonal mineral resource estimates to block modelling. This will optimize grade interpolation, determination of high grade capping levels, and aid with mine / mill reconciliation process.

- Improvements in the material handling process could result in favourable impact on the mine operating costs.

- Upgrade of the ventilation system will have a favourable impact on the work environment temperature.

Main risks that could be present at the operation are as follows:

- Future exploration programs are unable to keep pace with mining that in turn results in mineral resources and mineral reserves being depleted;

- Increased costs for skilled labour, power, fuel, reagents, trucking, etc. could lead to an increase the cut-off grade and decrease the level of mineral resources and mineral reserves;

- Mechanical breakdown of critical equipment (hoist, conveyance, mill, etc.) or infrastructure that could decrease or halt the production throughput at the mine;

- Production throughput relies on completing development activities as per the mining plan schedule. If lower development productivity than budgeted are encountered, this will likely affect the production profile of the current mining plan.

The following recommendations are provided:

- 2017 will be a transformational year at Macassa as the company changes the mineral resource calculation method from modified polygonal to block modelling. This change is anticipated to result in more efficient resource updates, facilitate grade reconciliation studies and will provide benefits to the LOM planning.

- Exploration Drilling will continue to test for the easterly strike extension of the SMC mineralization to the east employing a combination of deep scout level drilling from surface, with follow-up underground drill testing from the 5300 Level east

- 2017 will be a transformational year at Macassa as the company changes the mineral resource calculation method from modified polygonal to block modelling. This change is anticipated to result in more efficient resource updates, facilitate grade reconciliation studies and will provide benefits to the LOM planning.

- Exploration Drilling will continue to test for the easterly strike extension of the South Mine Complex ("SMC") mineralization to the east employing a combination of deep scout level drilling from surface, with follow-up underground drill testing from the 5300 Level East.

- Complete technical studies to increase the airflow and reduce the work environment temperature and humidity. Some study work can be completed internally; Otherwise, approximately $50,000 was budget to complete technical work.

- Technical work should be undertaken to assess infrastructure requirements for the continuous mining of the Macassa deposit.

In the opinion of the Qualified Persons (QPs), the MRMR estimates truly reflect the mineralization that is currently known and were completed in accordance with the requirements of National Instrument 43-101 (NI 43-101).

1.0 INTRODUCTION

This National Instrument 43-101 Technical Report was triggered by the disclosure from KLG of its AIF for the year 2016 (section 4.2 (1) (f) of the Instrument).

The Technical Report was prepared by employees of KLG and under the supervision of Pierre Rocque, P. Eng. and Douglas Cater, P. Geo. Both QPs are not independent of KLG, as allowed under section 5.3 (3) of the Instrument.

Information was obtained through operation and technical work related to the Macassa Mine over the past few years.

The two QPs frequently visited the Macassa Mine throughout the year.

The units of measures used in this report conform to the metric system. Unless stated otherwise, the Canadian Dollar (CDN$) is the currency used in this Technical Report. A list of abbreviations is displayed in Table 1-1.

μ	micron	kVA	kilovolt-amperes
°C	degree Celsius	kW	kilowatt
°F	degree Fahrenheit	kWh	kilowatt-hour
μg	microgram	L	litre
A	ampere	L/s	litres per second
a	annum	m	metre
bbl	barrels	M	mega (million)
Btu	British thermal units	m^2	square metre
CDN$	Canadian dollars	m^3	cubic metre
cal	calorie	min	minute
cfm	cubic feet per minute	MASL	metres above sea level
cm	centimetre	mm	millimetre
cm^2	square centimetre	mph	miles per hour
d	day	MVA	megavolt-amperes
dia.	diameter	MW	megawatt
dmt	dry metric tonne	MWh	megawatt-hour
dwt	dead-weight ton	m^3/h	cubic metres per hour
ft	foot	opt, oz/st	Troy ounce per short ton
ft/s	foot per second	oz	Troy ounce (31.1035g)
ft^2	square foot	oz/dmt	Troy ounce per dry metric tonne
ft^3	cubic foot	ppm	part per million
g	gram	psia	pound per square inch absolute
G	giga (billion)	psig	pound per square inch gauge
Gal	Imperial gallon	RL	relative elevation
g/L	gram per litre	s	second
g/t	gram per tonne	st	short ton
gpm	Imperial gallons per minute	stpa	short ton per year
h	hour	stpd	short ton per day
ha	hectare	t	metric tonne
hp	horsepower	tpa	metric tonne per year
in	inch	tpd	metric tonne per day
in^2	square inch	US$	United States dollar
J	joule	USg	United States gallon
k	kilo (thousand)	USgpm	US gallon per minute
kcal	kilocalorie	V	volt
kg	kilogram	W	watt
km	kilometre	wmt	wet metric tonne
km/h	kilometre per hour	yd^3	cubic yard
km^2	square kilometre	yr	year
kPa	kilopascal		

Table 1-1: List of abbreviations.

2.0 RELIANCE ON OTHER EXPERTS

For some aspects of this Technical Report, the QPs relied on the following persons:

- Natasha Dombrowski, Environmental Coordinator (section 19; environmental).
- Alasdair Federico, Executive Vice President (section 4.3 and section-19; community and First Nations).
- Amanda Kasner, Comptroller Canadian Operations (Section-19; financial assurances).

3.0 PROPERTY DESCRIPTION AND LOCATION

The following sections are copied (and updated) from the previous Technical Report (Clark, 2015).

3.1 Location

The Macassa Mine is in the Municipality of Kirkland Lake within Teck Township, District of Timiskaming, in the eastern part of Northern Ontario, Canada. Macassa is at approximately 48°10' N Latitude and 80°2' W Longitude at an elevation of approximately 305 m (Figure 3-1).

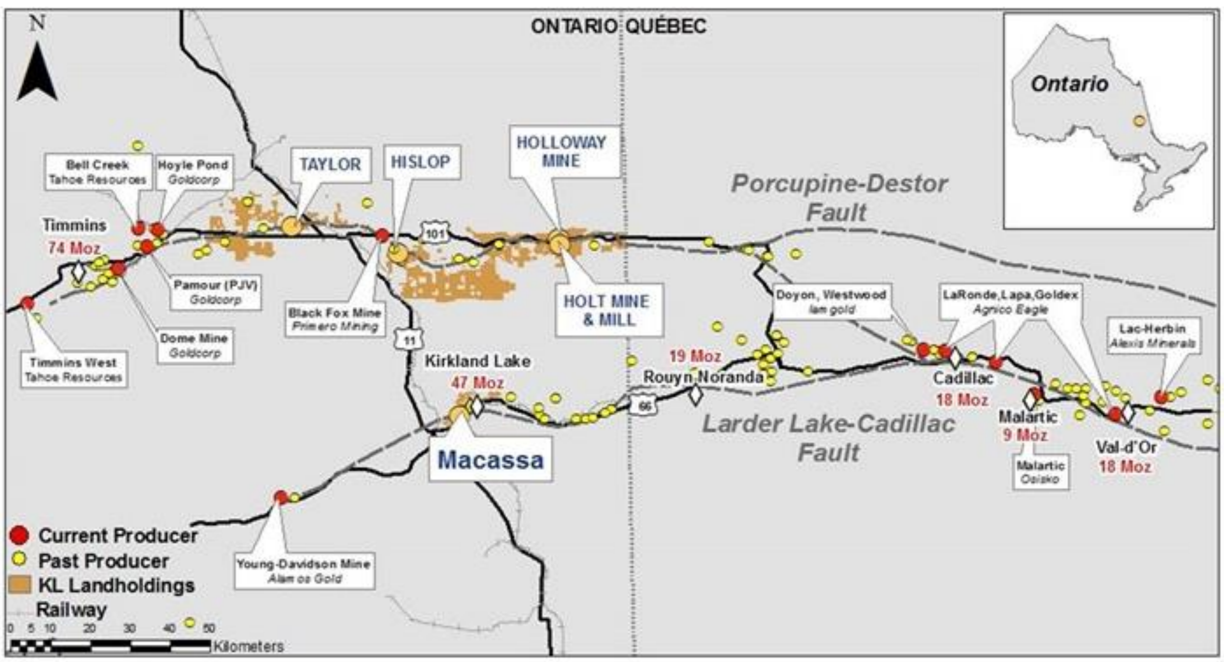

Figure 3-1: Location map.

3.2 Mineral Tenure and Encumbrances

KLG holds title to 253 mining claims in Teck and Lebel Townships that covers 4,035 hectares (ha). There are 186 patented claims, 11 crown leases and 56 staked claims. Macassa Mine is the only currently active operating mine within these property groups (Figure 3-2). Title to the Company's Mining Claims and Leases While the Company has carried out reviews of title to its mining claims and leases, this should not be construed as a guarantee that title to such interests will not be challenged or impugned. The mining claims and leases may be subject to prior unregistered agreements or transfers or native land claims, and title may be affected by undetected defects. The Company has had difficulty in registering ownership of certain titles in its own name due to the demise of the original vendors of such titles when owned by the Company's predecessors-in-title. Any material title defects would have a materially adverse effect on the Company, its business and results of operations

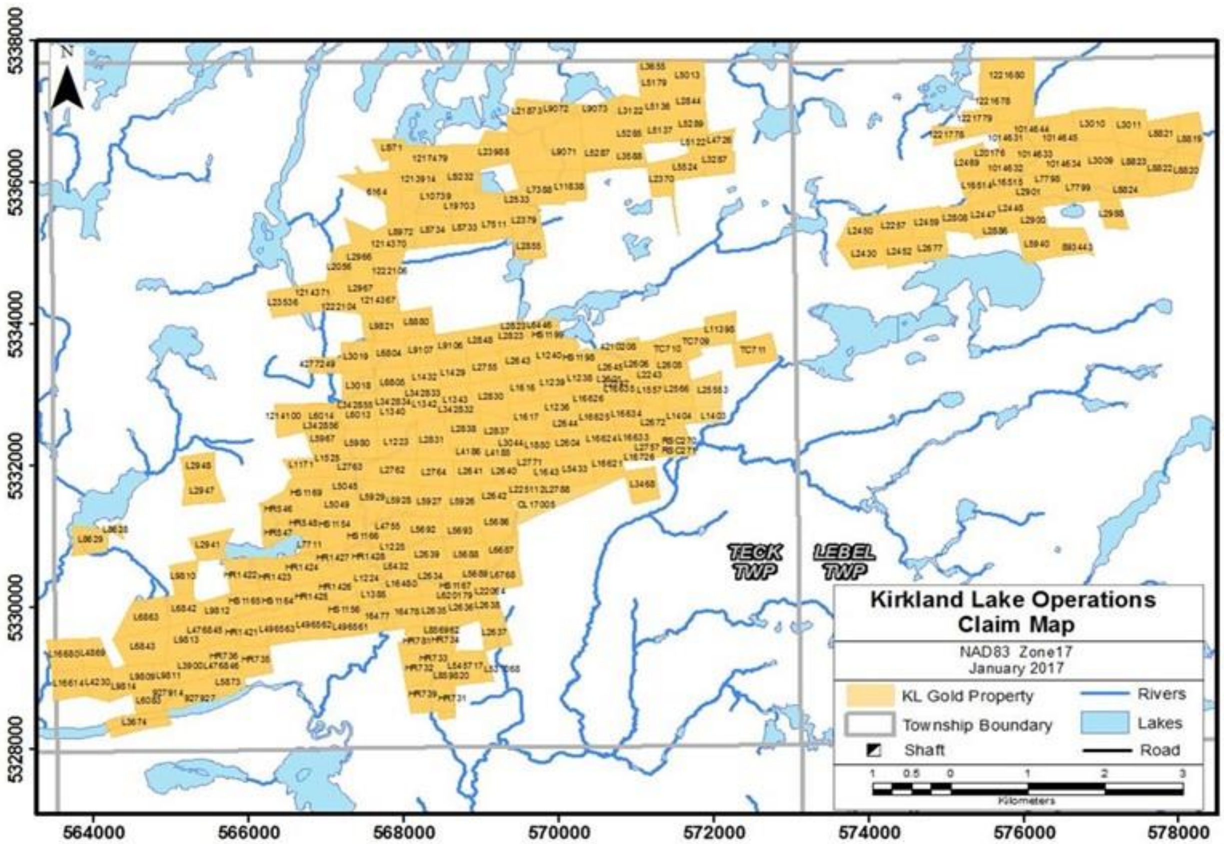

Figure 3-2: Claims Location Map.

There are 100 patented claims covering 1,365 ha that include mineral rights and surface rights. There are 61 patented claims covering 860 ha that hold the mineral rights only. These claims are surveyed and do not require assessment work to be done each year. There are 11 Crown Leases covering 306 ha that hold the mining rights only. These leases are surveyed and do not require assessment work each year. Taxes have to be paid on both the patented claims and the crown leases. In addition, there are 25 patented claims that hold only the surface rights and taxes are paid on them. There are 56 staked claims. These claims are not surveyed and require a minimum assessment work to be done each year. In the second and all subsequent years, a minimum of $400 of assessment work per 16 ha claim unit per year is to be reported until a lease is applied for. The work does not have to be done on each claim as it can be spread over adjacent claims and excess work in a year can be used for later years. Some of the staked claims will not require the $400 exploration expenditures as stated above until 2016 Doug update. Other claims will require the assessment work between 2018 and 2020. There are enough excess work credits to keep the claims in good standing for at least another 10 years.

All the claims are located in eastern Teck Township and western Lebel Township. They cover the properties of Macassa Mine including the Tegren property at the west end of the mine strip. To the east of Macassa the properties cover the past producing mines of Kirkland Minerals, Tech-Hughes, Lake Shore and Wright-Hargreaves. Of note, the Lebel claims are not contiguous with the main property. A list of all the claims with associated royalties is provided in Appendix A.

On March 28, 2012, KLG purchased the joint venture properties from Queenston (now Canadian Malartic Corporation) and those properties are now owned 100% by KLG. There are still some conditions regarding further payments: in the event that production from these claims exceeds 1,300,000 (Troy) ounces of gold, KLG will pay Canadian Malartic Corporation $15 per ounce for the first 1,000,000 ounces produced above the threshold and will pay $20 per ounce for any ounces above 2,300,000. The claims that are affected include: Morgan, HM (Hurd McCauley), Trudel, North AK, Hudson, Kirkland West, Gracie West and Axcell claims.

Many of the claims have royalties due to the previous owners. These royalties are usually based on production or the Net Smelter Return (NSR) from the sale of the metal production. They apply to one or more claims and vary depending on the agreement reached when purchasing the claims. A plan showing the individual boundaries and notes related to the royalty agreements are displayed in Figure 3-2 and Table 3-1 respectively.

On October 31, 2013 KLG and Franco-Nevada completed a royalty transaction. Franco-Nevada paid US$50 million for a 2.5% NSR on the production from all of KLG's properties. This royalty is in addition to any existing royalties. KLG bought back 1% at the end of 2016 for US$36 million.

Note	Item
1	SIS: 1.5% NSR
2	Mallpacks Development: 1.5% NSR
3	2% NSR to Condie
4	Spark Gold Mines 1% net proceeds
5	KGI 1/4 share, A.H. Seguian to 2/4 share, Thomas Wood to 1/4 share
6	Thompson/Pollock(Millyard) 5% NPI
7	Boisvert $3000 annual, $0.25/ton milled, 20% NPI to Franco-Nevada, min. $10,000 annual.
8	Robert Price $8/Ton if Au> CDN$1,000/oz
9	KGI 450/500 share, W.P. St. Charles to 25/500 share, James W. McFadden to 11/500 share, James Cowan to 7/500 share,
10	Davis (Willroy) Royalty $1.5/Ton. Still to be transferred from Barrick
11	$8/Ton if Au>CDN$1,000/oz to Karl Gerber/Gord St. Jean
12	Gracie: $10,000 when mining on claim, 20%NPR to Franco-Nevada, $10,000 Min annual, part of St. Joseph royalty
13	KGI 2/3 interest, John McIvor to 1/3 interest
14	Town of KL: 3%NSR
15	Dyment/Kidston 1.5% NSR
16	Condie: $4/Ton milled
17	3% NSR Royalty to Franco-Nevada if Au>CDN$US1,000/oz
18	47.5% Interest held by Arthur Lillico, 5% Interest to John McB
19	2% NSR to Franco-Nevada, 4.75% NPR to Forbes Estate, 3.75% NPR to Mike Leany, 1.5% NPR to J. Forbes
20	2% NSR to Franco-Nevada, 3.5% NPR to Premier Explorations, 0.8% to Ron Crichton, 3.5% NPR to Mike Leany, 2.2% NPR
21	2% NSR to Axcell
22	100% Ownership, 2% NSR To Trudel, Buyback 50% For CDN$1,000,000
23	100% Ownership, 1.5-3% NSR, Advance Royalty Of $50,000/year commencing Feb. 2011
24	100% Ownership, 2% NSR to Premier Royalty Inc., 1% to Hurd/McCauley
25	2% NSR to Alamos (previously Aurico Gold)
26	2% NSR to Daniel Belshaw
27	2% NSR to Franco-Nevada, 0.33% NSR to Michael Leahy, 0.12% NSR to Ron Chrichton, 0.16% NSR to James Forbes
28	In the event that production from these claims exceeds 1,300,000 ounces of gold KLG will pay Canadian Malartic Corporation $15 per ounce for the first 1,000,000 ounces produced above the threshold and will pay $20 per ounce for any ounces above
29	Franco-Nevada Coporation 1.5% NSR (bought back 1% from FNV in 2016)
30	Estate of Ernie Deloye, 5% mine value(~20% metals recovered) capped at CDN$250,000
31	Todd Morgan - Morgan claim $50K Adjusted Annual minimum royalty - payable in mid April, or 1.5% NSR gold price > C$700 / oz, 2% NSR if gold price is >C$700 and <C$1,000 / oz, and 3% NSR if gold price is > C$1,000 / oz

Table 3-1: Royalties notes.

3.3 Permit Status

With the exception of the Land and Rivers Improvement Act (“LRIA”) permit required to operate the tailings (expected by the end of March 2017), all permits and certificates are in good standing with the appropriate regulatory offices. Updates or modifications are performed in compliance with current legislation.

3.4 Environmental Liability and Other Potential Risks

In the QP's opinion, there are no significant factors or risks, besides obtaining the LRIA permit to operate the tailings facilities that may affect access, title or the right or ability of KLG to perform work on the Macassa property.

4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The following sections are copied (and updated) from the previous Technical Report (Clark, 2015).

4.1 Climate, Topography and Physiography

Climatic conditions are typical for the central Canadian Shield, with short, mild summers and long, cold winters. Mean temperatures range from –15°C in January to 18°C in July. Mean annual precipitation throughout the region averages 764 mm, including average snowfalls of 219 cm.

The area is primarily covered by forest (spruce and poplar are the main essences), swamps and lakes, with relatively modest relief. Rock outcrops surrounded by glacial till are common, but the till is generally not very thick (up to 46 m in some locations). The area around the mine sits at approximately 305 m above sea level (masl).

4.2 Means of Access to the Property

The Macassa Mine is at the west end of the community of Kirkland Lake. The Mine is adjacent to Highway 66 just east of Highway 11. The area is serviced by railway and bus. Although there is a small airport at Kirkland Lake there is no scheduled transportation service to the airport from southern Ontario. Kirkland Lake is approximately 600 km by road north of Toronto.

Surface amenities are secured behind fenced and gated facilities. The security service is company-owned; all personnel and visitors are required to sign in and out of the facilities (or use an access card provided by KLG). Employee and visitor parking areas are provided outside the gated facilities.

4.3 Infrastructure and Local Resources

Kirkland Lake (approximately 10,000 inhabitants) has been a mining community since the Tough-Oakes Burnside Mine (later called the Toburn) started in 1915. As a result, an experienced mining work force as well as mining services, equipment and infrastructure are readily available.

The mining complex is located on the edge of the town of Kirkland Lake. As such, it is a part of the community landscape, and operational and environmental considerations are of vital importance to community relations. KLG is committed to supporting the community, not just through its operational standards and performance, but also socially and culturally. KLG is an active member of the community and contributor to community events, and maintains an open dialogue with community leadership.

Power is supplied through the Hydro One grid. Water is plentiful in the area and can be sourced from rivers and small lakes.

The ore is treated at the company's Macassa mill and tailings are managed on site.

Waste rock is typically hoisted to surface unless it can be used as a source of backfill material for the underground stopes, as needs arise.

KLG does not anticipate opposition from the local communities to continued operation of the Macassa Mine. The primary First Nations community living close to the Macassa property is the Wahgoshig First Nation (WFN). The WFN is an Anishinaabe (Algonquin and Ojibwa) and Cree First Nation located near Matheson, in the Cochrane District of north-eastern Ontario, Canada. The reserve covers 7,770.1 ha (Abitibi 70 Indian Reserve) on the south end of Lake Abitibi. The First Nation community has approximately 270 registered people; 121 people live on the reserve, where they provide the following services: band office, health clinic, warehouse / fire hall, public works garage and a community hall. Wahgoshig is policed by the Nishnawbe-Aski Police Service, an Aboriginal staffed service.

KLG has recently signed an agreement with First Nations who have treaty and aboriginal rights which they assert within the operations area of the mine.

The agreement provides a framework for strengthened collaboration in the development and operations of the mine and outlines tangible benefits for the First Nations, including skills training and employment, opportunities for business development and contracting, and a framework for issues resolution, regulatory permitting and Kirkland Lake Gold's future financial contributions.

To the extent relevant to the mineral project, it is the opinion of the QPs that the surface rights, the availability and sources of power, water, mining personnel, potential tailings storage areas, potential waste disposal areas and processing plant site are sufficient to continue the operations of the Macassa Mine.

5.0 HISTORY

The following sections are copied (and updated) from the previous Technical Report (Clark, 2015).

5.1 Property Prior Ownership

The Kirkland Lake mining camp has been a prolific gold producer since mining began there in 1915. The Macassa Mine and the four former producers that KLG now owns have produced approximately 22 million ounces of gold since 1917. The production from these five mines accounts for about 90% of the camp total production.

The Macassa Mine started in 1933. The first shaft was sunk in the Main Break zone in the late 1920's to a depth of 152 m; however, sufficient gold was not located and operations were halted. In 1931, the Macassa property was entered via underground access at the east end of the property from the adjacent Kirkland Minerals Mine from the 2475 Level. This entry was successful in finding gold and in October 1933 the first mill on the property began processing the ore at a rate of 181 tpd. The milling rate was increased to 386 tpd in 1949 and to 476 tpd in 1956. In August 1988 a new mill was built that could process up to 544 tpd of ore and 680 tpd of tailings. By 1996, modifications had increased mill capacity to 816 tpd of ore and 907 tpd of tailings. When mining was suspended in 1999, mill capacity was near 1,361 tpd of ore.

In 1986, the #3 Shaft was sunk from surface to a depth of 2,233 m. At that time, this was the deepest single lift shaft in the Western Hemisphere.

Starting in 1988 and until October 1999, the tailings from the Lake Shore Mine were processed at Macassa. These tailings were recovered by either dry mining or by dredging.

Rock burst activity was quite common in the deeper sections of the mines in the Kirkland Lake camp. Macassa was no exception and in November 1993 a rock burst collapsed 2 stopes at the 6700 Level and in April 1997 damaged the #3 Shaft at the 5800 Level. Both of these occurrences forced work stoppages; otherwise, the mine would have operated continuously since 1933. The rock burst on April 1997 limited mining to above the 5025 Level. The restriction was modified in October 1998, allowing mining above the 5300 Level.

Operations were suspended in 1999 due to the declining price of gold. The workings were allowed to flood in 2000.

Macassa Mines Ltd. was incorporated in 1926 and evolved through a succession of mergers to become Lac Minerals Ltd. in 1982. The merger consolidated the properties of the Little Long Lac group into one entity and the Macassa Mine and the other Kirkland Lake properties were included. Lac Minerals was acquired by Barrick Gold Corporation in August 1994 and Barrick offered a number of Lac Minerals' mineral properties for sale. After a short period of operation by Barrick the property was sold to Kinross Gold Corporation in May 1995. Foxpoint Resources purchased the Kirkland Lake properties from Kinross in December 2001 for $5 million and the assumption of $2 million in reclamation bond obligations related to the closure plan for the properties. Foxpoint changed its name to Kirkland Lake Gold Inc. in October 2002. Following the recent business transaction with Newmarket Gold Inc. in 2016, the new company is now called Kirkland Lake Gold Ltd.

5.2 Historical Mineral Resources and Mineral Reserves

Historical Mineral Resources were calculated annually by the Geological personnel at the mine, using a modified polygonal method. Mineral Resources and Reserves were audited annually by Glenn Clark and Associates. The methodology and parameters have remained consistent over the years.

5.3 Exploration and Development Work

Upon purchasing the assets in 2001, exploration efforts concentrated on surface drilling on the former Wright Hargreaves, Lakeshore, Teck Hughes and Kirkland Minerals properties. As the Macassa #3 Shaft was de-watered, underground exploration at Macassa was phased in, beginning in 2002. This culminated in the discovery of the SMC in 2005. From that point to 2010, exploration was all underground at Macassa. In 2010 surface exploration programs were re-implemented in conjunction with underground exploration at Macassa, which continues to this day. Underground development at Macassa to facilitate exploration includes drifting and drill bay excavations on various levels, now for the most part on the 5300 level, to explore and extend the SMC eastward.

5.4 Historical Production from the Property

From 1933 to 2016, Macassa produced over 5.0 million ounces of gold from 11.4 million tons of ore at an average grade of 0.44 opt (Table 5-1).

DECADE OF PRODUCTION	TONS X 1000	GRADE, oz Au/ton
1930's	564	0.48
1940's	1,087	0.45
1950's	1,440	0.4
1960's	1,290	0.48
1970's	943	0.56
1980's	1,314	0.49
1990's	1,294	0.47
2000's	984	0.35
2010-2014	1,832	0.37
2015	249	0.42
2016	431	0.41
1933 to 2016	11,428	0.44

Table 5-1: Historical production (1933 to 2016).

6.0 GEOLOGICAL SETTINGS AND MINERALIZATION

6.1 Regional Geology

The Kirkland Lake mining camp is located in the west portion of the Archean Abitibi greenstone belt of the Abitibi Subprovince that forms part of the Superior Province in the Precambrian Shield.

In the Kirkland Lake area, the Abitibi Subprovince is composed of komatiitic, tholeiitic and calc-alkaline volcanic rocks, turbidite-dominated sedimentary lithologies, locally distributed alkaline metavolcanic rocks and associated fluvial sedimentary formations. These successions have been intruded by tonalite, trondhjemite and granodiorite batholiths.

Large scale structures and tectonic fabrics are distributed in domains with rock foliations generally paralleling the regional faults, intrusive contacts and domain boundaries. The regional shear zones, folding and steep reverse faults post-date the batholith emplacement. Metamorphism of the Abitibi rocks is generally very low greenschist facies, however upper greenschist to hornblende facies may be attained in metamorphic aureoles surrounding intrusions.

6.2 Local and Property Geology

6.2.1 Local Geology

The Timiskaming Group of rocks is the main feature in the area. This group forms part of a complex synclinorium that is flanked unconformably on the north and south by the mafic to felsic, massive to pillow volcanic rocks of the Kinojevis and Blake River groups. The Timiskaming Group is up to 3,200 m thick and extends for about 64 km from Kenogami Lake in the west to the Quebec border. In the Kirkland Lake area, the Timiskaming is predominantly conglomerates and sandstones, trachytic lava flows and pyroclastic tuffs. The Timiskaming trends N65°E and dips steeply south at Kirkland Lake. Immediately east of Kirkland Lake, the formations are warped to an east-southeast direction, then return to an east-northeast direction at Larder Lake, and continue this way to the Quebec border.

The Timiskaming sediments are intruded by fractionated alkalic rocks, which include augite syenite, feldspatic syenite and syenite porphyry in the form of dykes and sills. Alkali stocks have intruded the Timiskaming Group and the supracrustal assemblage along the south margin of the synclinorium. Matachewan diabase dykes trending north-northeast cut all rocks in the area. (Figure 6-1).

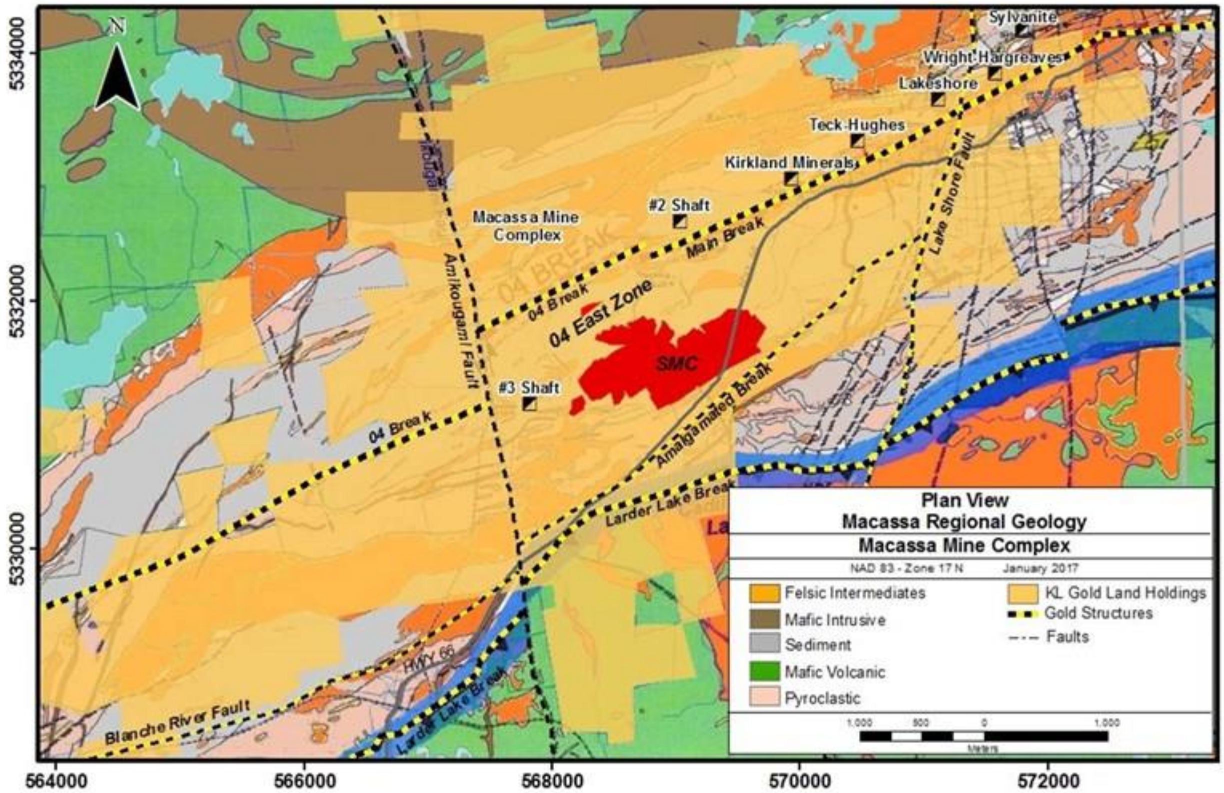

Figure 6-1: Regional Geological setting – Macassa Mine Complex.

The Kirkland Lake-Larder Lake Break and its associated splay faults and fracture system, form a complex, major structural feature, which transects and follows the trend of the Timiskaming Group at Kirkland Lake. This break can be traced for about 320 km from Matachewan west of Kirkland Lake all the way to the Grenville Front east of Louvicourt, Quebec. In addition to Kirkland Lake, it passes through or near the important mining areas of Larder Lake, Rouyn-Noranda, Cadillac, Malartic, Val d'Or and Louvicourt. Numerous gold occurrences and gold mines are spatially related to this regional structure.

The fault or break system that hosts the Kirkland Lake gold deposits is north of the main Kirkland Lake-Larder Lake Break. Polyphase deformation has affected the Timiskaming rocks at Kirkland Lake. The fold axis and structural plunges, including gold ore shoots, generally trend west-southwest at –60°.

6.2.2 Macassa Property Geology

At the Macassa Mine, the Timiskaming tuffs, conglomerates and syenites are encountered. The felsic syenites are the preferential hosts of the gold mineralization in the #1 and #2 Shaft areas. The basic syenites are the preferential hosts for gold in the bottom half and the tuffs in the upper portion of #3 Shaft area.

The Timiskaming age sediments are composed of pebble conglomerates, greywackes and finer inter-bedded wackes. Adjacent to and interlayered with these sediments are varied pyroclastic/lithic and volcanic ash tuffs. Both the sediments and volcanic rock are commonly found on the north and south flanks of the elongated intrusive composite stock.

Augite or basic syenite is the oldest and most wide-spread of the intrusive types. Situated within this intrusive, there is a westerly plunging pipe-like mass of felsic syenite, which enters the east end of the Macassa property at the 1300' sublevel elevation on the hanging wall side of the Main Break. Both the basic and felsic syenites are intruded by syenite porphyry. The porphyry unit exhibits sharply defined intrusive contacts while conforming closely to the strike and dip of the regional formations. This composite stock dips steeply to the south and widens with depth.

The three main components of the syenitic stock and related dykes are: augite syenite, felsic syenite, and syenite porphyry. These intrusive rocks are host to an important part of the ore at the Mine Complex. North-south striking diabase dykes are known to intrude all sediments and intrusives as well as post-dating the ore forming structural breaks.

The Kirkland Lake Gold Deposit occurs in, and peripheral to a composite, multi-phase syenite stock that intrudes east-northeast trending clastic sedimentary rocks and alkaline tuff of the Timiskaming assemblage. Gold mineralization is associated with the Kirkland Lake Fault System, a probable early syn-metamorphic, northeast-trending, and steeply southeast dipping reverse fault network that includes the ‘04, Main, North, and South breaks, and which is localized along the northeast-trending syenite complex hosting the deposit. Gold mineralization in the South Mine Complex area occurs in a complex interconnected network of narrow, east to northeast trending, moderate southeast to south dipping mineralized shear zones and auriferous alteration. (Rhys, 2006 / 2008).

7.0 DEPOSIT TYPE

7.1 Mineralization

The gold mineralization at Macassa is located along the breaks and subordinate splays as individual fracture fill quartz veins, from several inches thick to as much as 3.7 m thick. Veins may be of single, sheeted, brecciated or stacked morphology. Several generations of quartz deposition are evident from colour and textural variability and quartz veins are generally fractured. Also found are sulphide rich (pyrite) zones.

The presence of a fault splay is often a prerequisite for gold deposition. Broader zones of mineralized, brecciated and fragmented quartz are found in the footwall and hanging wall of major faults.

Gold is usually accompanied by 1% to 3% pyrite and sometimes is associated with molybdenite and/or tellurides of lead, gold, gold-silver, silver, nickel and mercury (altaite, calaverite, petzite, hessite, melanite, coloradoite). Silver is present amalgamated with the gold and in the minerals petzite and hessite.

The presence of pyrite and silicification does not guarantee gold; however, higher grade gold is accompanied by increased percentages of pyrite and silica.

Hematization or bleaching with carbonatization and silicification are common alterations of the wall rocks. Sericitization is a more local feature. The alteration has enriched the rocks in K_2O and depleted them in Na_20.

The new discoveries in the South Mine Complex (SMC) generally are of a different style of mineralization with wide sulphide systems rather than the quartz vein mineralization that is found in the Main Break complex. Tellurides appear to be more prevalent in the SMC, compared to the historical mineralized systems, in particular the occurrence of the gold telluride mineral calaverite.

These new, wide, hydrothermally altered zones could represent a new plumbing system for a southern mineralized part of the Camp parallel to the Main Break, fed by a deep porphyry body. The gold mineralization is found in carbonate altered conglomerate, tuff and porphyry, mineralized with up to 10% disseminated pyrite. Quartz veining and silicification when hosted within the porphyry may also characterize the SMC.

Panterra Geoservices (D. Rhys 2017) has proposed a new conceptual mineralizing model for the ’04 Main Break / SMC zones. Figure 7-1 represents a schematic alteration cross section (looking east) showing different alteration styles along the shear zone / fault network that is host to ore in the Macassa Mine. Here the Amalgamated Break is interpreted as the master structure off which the 04 Break, SMC and AK zone splay and link between. Reduced, sericite-carbonate -chlorite alteration is developed extensively along the Amalgamated Break in association with largely barren, white quartz veins and may feed into the subsidiary faults. Fluids originally flowing along the Amalgamated Break may have fed into splaying structures such as the 04 Break and SMC. Most ore deposition has occurred in areas where carbonate-pyrite alteration is interspersed with more oxidized reddish-orange tinted alteration assemblages that occur more distally to the feeder structures, and regional magnetite-biotite-amphibole assemblages are altered to K-feldspar-hematite carbonate.

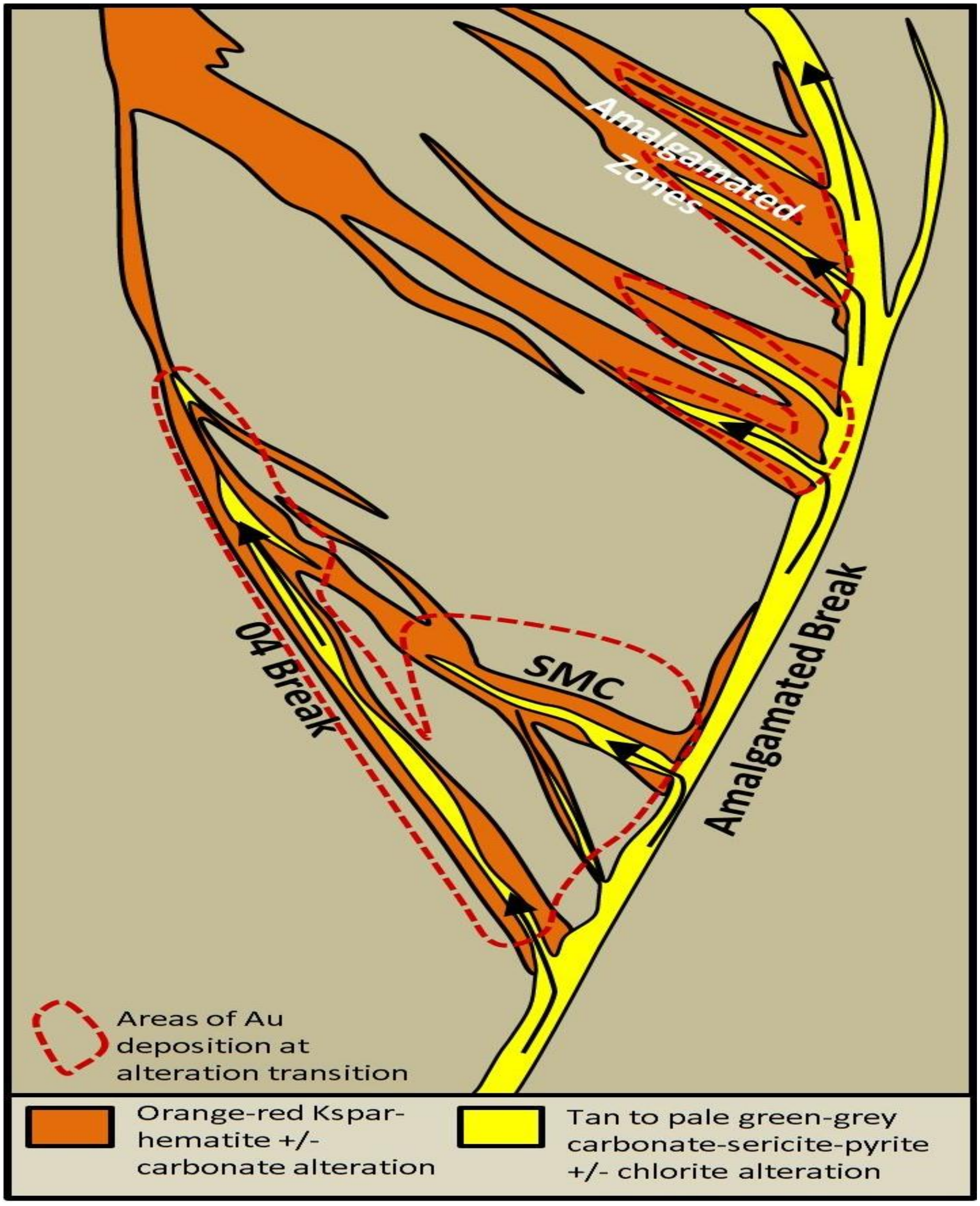

Figure 7-1 Alteration and patterns at the Macassa Mine (Rhys 2017)

7.2 Gold Zones

The following is a summary from Clark (2015).

The gold mineralization at Macassa is found along breaks or faults, in veins as quartz filled fractures, as breccias and as sulphide (pyrite) zones.

There are a number of these breaks. They are named the ‘04’, ‘05’, No.6, Kirkland Lake Main and the Kirkland Lake North and South branches. The breaks trend about N60°E and dip steeply, 70° to 80° south in keeping with the Timiskaming trend.

At Macassa, the Main Break has been mined from 396 m to 1,706 m with it being the most important zone in the eastern part of the mine. The ‘04’ Break is in the western part of the property and was the main producing break at Macassa. It has been mined by ramp above the 3400 level (1,036 m) to the 3100 level (945 m) and extended up to the 884 m elevation by diamond drilling. The ‘04’ Break has been mined to the bottom of the mine at the 7000 level (2,134 m) and the ore is known to continue deeper. The ‘04’ Break is located about 185 m north of the Main Break and connects to it by sigmoidal cross structures. The ‘04’ Break is a thrust or a reverse fault striking N65ºE and dipping 80° to the south.

The ‘05’ Break is located approximately 425 m north of the ‘04’ Break. It splays into north and south branches to the east. The South Branch, about 365 m north of the ‘04’ Break, appears to correlate with the Narrows Break that extends to the east across the rest of the camp.

The trend of the gold mineralization in the Kirkland Lake camp conforms to the 60º westerly plunge of the syenite intrusions. Locally, the plunge of the gold mineralization depends on the intersection of the host splay structures and can be quite different from the camp trend.

In addition to the mineral trends that have been historically productive, KLG has located significant mineralization in a number of zones to the south of these breaks. The Upper D Zone strikes N28°E and dips 40° to the east. The other zones are all included in the area now called the SMC. The strike and dip of the zones in the SMC vary. The Lower D Zone strike varies from N05°E to N30°E and dips 70-80° east. This has been confirmed through mining. It is possible that there is more than one ore structure/alteration halo giving the appearance of one steeply dipping structure. The Lower D North zones strike NE and dip 30-45° southeast. The other SMC zones strike N60°E, generally parallel to the main Kirkland Lake structures with varying dips from 20-60° south. The SMC, as defined to date, appears to merge with and be terminated by the ‘04 Break between the 4700 and 4900 foot levels. The shallow dipping east portion of the SMC appears to be terminated in the down-dip component by the Amalgamated Break, close to the -5900 elevation. The relative position of these zones is shown in Figure 6-1.

Several strong north easterly trending cross-faults offset the mine host rocks and mineralized zones with displacement usually to the south (dextral) and up on the west side. Major cross faults are the Lakeshore Cross Fault near the east end, the Tegren in the centre and the Amikougami Creek at the west end of the mine. The major gold bearing zones have not been found west of the Amikougami Creek Fault.

8.0 EXPLORATION

KLG carries out a large exploration program on surface throughout their holdings in the Kirkland Lake Area and from underground from the Macassa Mine (Figure 8-1). In the past, some of the exploration has been carried out with a joint venture partner.

Surface drilling will act as “scouts” utilizing wide spacing to identify targets. In doing so, large sections of ground can be covered to identify mineralized trends.

The goal of the underground exploration is to define both inferred and indicated resources with the goal of replacing mined reserves and expanding the resource. By drilling closer to the target, the shorter hole lengths allow for greater precision required for resource definition.

Development headings are driven to give properly located drilling stations. The development headings are also driven to access the mineralization that has been found and to confirm its nature.

The exploration program was very successful finding the “D” Zone and the south zones that are now referred to as the South Mine Complex (SMC). These zones are now part of the mineral resource and mineral reserve estimates.

KLG has been exploring the closer to surface ABM and the Amalgamated Break Trend Zones. In the first 300 m below surface a lower grade resource has been identified. It is possible that these lower grade zones may be profitable to mine due to the location near surface that could accessed by a ramp. KLG is examining this possibility.

KLG will continue exploring their properties. These recent finds are very encouraging for further expansion of the mineral resources and mineral reserves by continuing exploration.

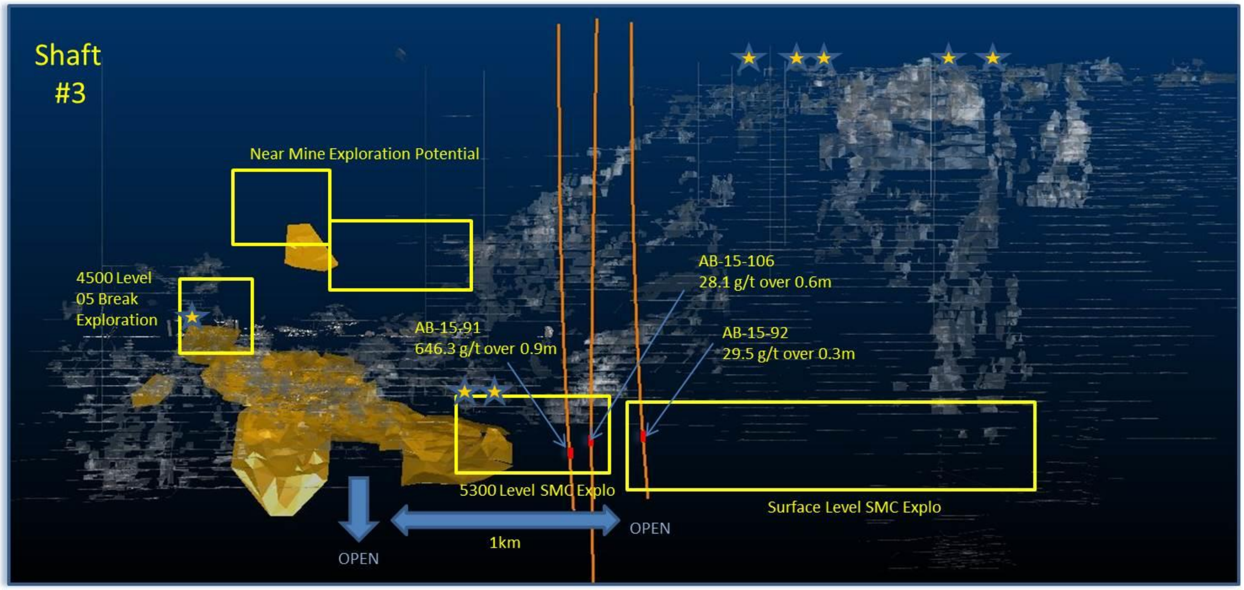

Figure 8-1: Vertical longitudinal section showing exploration targets around the Macassa Mine Complex

8.1 Macassa Surface Exploration Drilling

The 2016 surface diamond drilling program was designed to follow up on the success of 2015 deep surface exploration program which set out to test, with wide spaced holes, for mineralization east of the SMC resource area. The 2016 program also prioritized additional new targets for drilling. Key areas of focus for the program were continued deep drilling east of the current SMC resource toward the Lakeshore Cross Fault, deep drilling on the Main Break below -1830 m elevation on the Kirkland Minerals, Teck Hughes and Lakeshore properties, wide spaced drilling on the Amalgamated Break to test for mineralization and define camp scale geometry and lastly, a program designed to target the ’04 Break above -900 m elevation on both the east and west sides of the Tegren Cross Fault.

A total of 51,500 m of deep drilling, utilizing four (4) drill rigs, was completed on the SMC, Main Break and Amalgamated Break targets. The program was successful in intersecting additional gold mineralization east of the current SMC resource within a ‘mineralized horizon’ at a similar elevation to the eastward projection of the SMC. The program also intersected gold mineralization associated with the Main Break below – 1830 m elevation at various location across the property. Although the intercepts through the Amalgamated Break did not return gold mineralization, the program was successful in helping the define the geometry of the fault structure on a camp scale. In addition to the main drilling targets, several other anomalous intercepts above -1000 m elevation are of interest and will warrant follow up interpretation and possible drilling.

A total of 34,600 m of drilling, utilizing two (2) drill rigs, was completed on the on the ’04 Break above -900 elevation and successfully intersected gold mineralization on both the east and west sides of the Tegren Cross Fault.

The surface exploration drilling for 2017 will employ the “scout” concept with drilling to focus on the SMC corridor between sections 5000 east to the Lakeshore cross fault (section 100 East), approximately 855 m away by strike and the deep Main Break. Drilling will occur at wide spacing, starting with 300 m centre spacing. With holes in excess of 1,800 m in length, precision drilling would require directional drilling to insure proper spacing between the intercepts within the inter-break corridor which is defined by the Main Break to the north and the Amalgamated Break to the south.

8.2 Macassa Underground Exploration Drilling on the SMC

Previous surface drilling west of 5000 East has provided intersections, likely related to the SMC, to warrant extending the 5300 level an additional 760 m east from the recently excavated drill bay. Using the 5300 level exploration drift, the platform will be ideally suited to test both the SMC and mineralized systems related to the Main Break. Drill holes from the 5300 level rarely exceed 915 m in length and average less than 457 m in length.

Since 2005, approximately 446 kilometres of underground drilling has been completed at the Macassa Mine. This total represents only exploration drilling and does not include surface exploration or definition drilling. The majority of this exploration has been focused on the SMC.

The 2016 program has been very successful, locating some very interesting gold zones. The target areas are the Main Break, Parallel Breaks and North South structures, and the newer SMC on KLG’s land holdings.

8.2.1 South Mine Complex

The South Mine Complex (SMC) has been a very significant new find as it has a different character than the main zones that have been mined historically at Macassa. Some of the systems within the complex have larger widths and much higher grades than the main zones. They are some distance from the main zones and strike generally parallel to the main structures but have a much flatter dip ranging between 20 and 60°.The first indication of these structures was highlighted in a press release on July 11, 2005. KLG reported an intersection 90.4 feet assaying 2.3 ounces of gold (uncut) from Drill Hole

50-627 on what is now known as the New South Zone. Exploration of these zones is continuing with further expansion anticipated.

The location of the New South Zone relative to the other zones can be seen in plan view of the zones in Figure 8-2 and on longitudinal view in Figure 8-3.

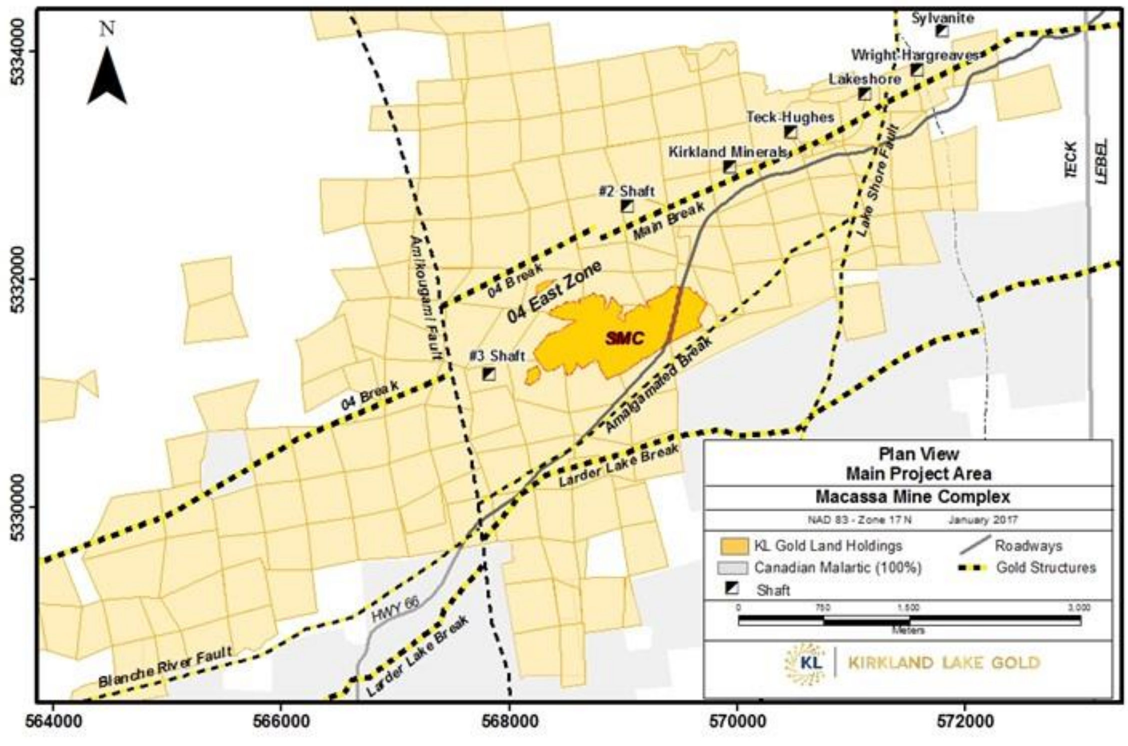

Figure 8-2. Plan view of the Macassa Mine Complex

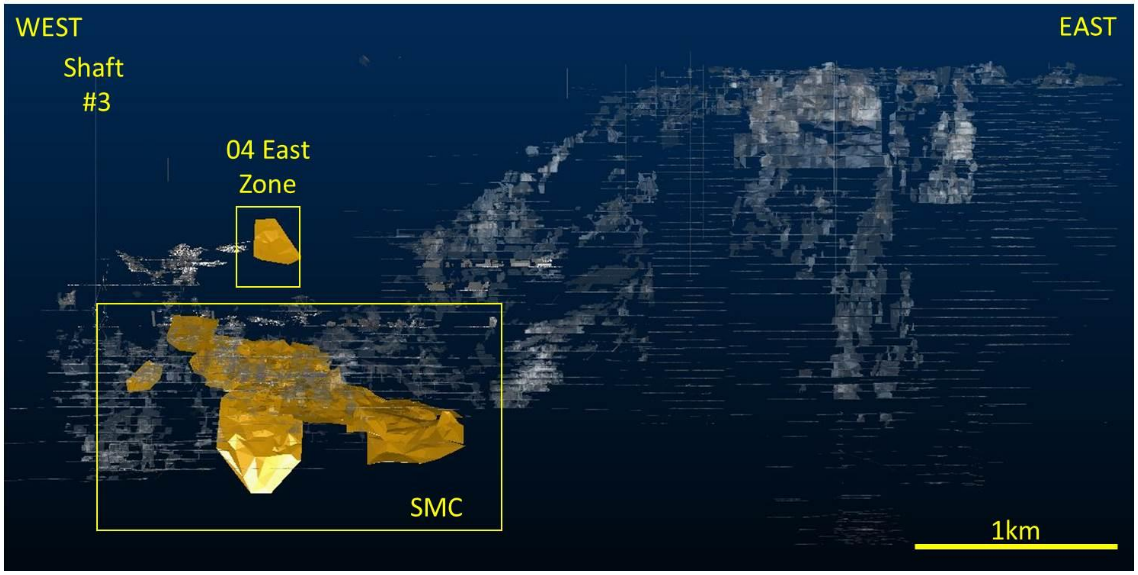

Figure 8-3: Vertical longitudinal section of the Macassa Mine Complex

These new, wide, hydrothermally altered zones could represent a new plumbing system for a southern mineralized part of the camp parallel to the Main Break, fed by a deep porphyry body.

The location of some of the latest South Zone intersections can be seen in the Plan View, Figure 8-4.

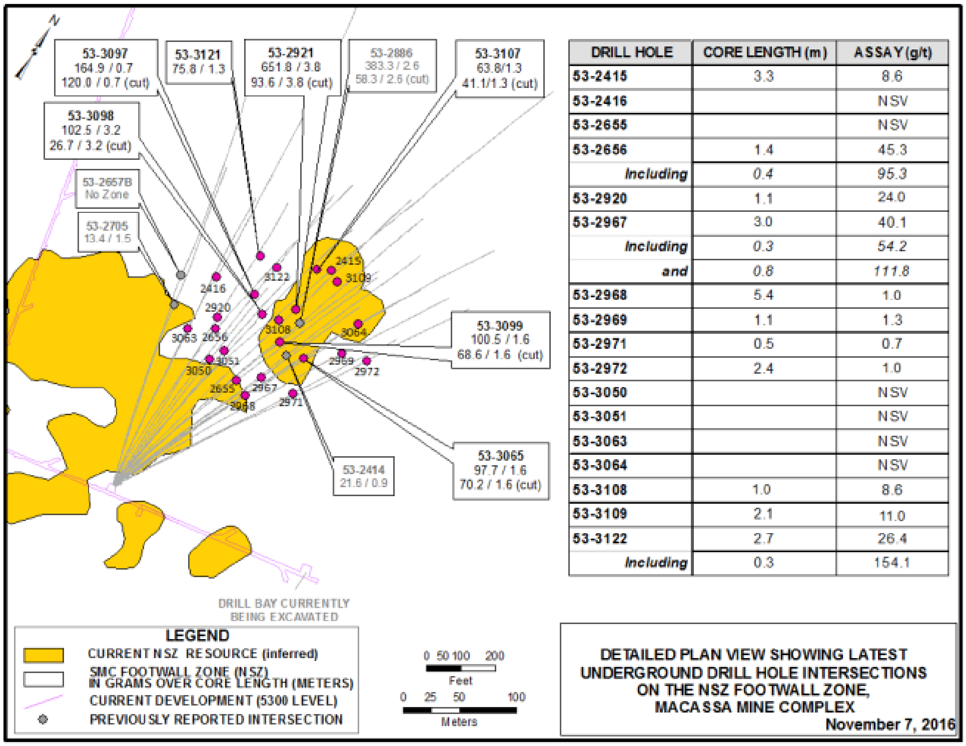

Figure 8-4: Detailed plan view of underground drillhole intersections, (release from November 7, 2016)

KLG's exploration program will be directed at expanding the potential of these zones along strike and dip. This will require drilling long holes from underground. To maximize the drilling, drifts and drill bays will be required to locate the drills properly.

8.2.2 ABM and Amalgamated Zones

The ABM and the Amalgamated Break Trend Zones (Amalgamated) have been known for some time. The ABM Zone is in part under the tailings pond. The Amalgamated Zone is generally located on the South Claims that were part of the Queenston Joint Venture but are now 100% owned by KLG.

With higher gold prices, the potential of these near surface zones became more interesting and for the last three years, drilling has been carried out to delineate a resource from surface down to 300 m in depth.

9.0 DRILLING

KLG contracts out all of the diamond drilling on surface and underground. The diamond drilling provides whole core recovery in mainly NQ diameter for surface drilling and BQ diameter for underground drilling programs, for the geologist to log and model.

The core is boxed by the contractor at the drill site and transported by KLG personnel to the Macassa core shack for logging and sampling.

For 2016, a total of 11-13 diamond drills were used on the Macassa property. Four to six of those were surface rigs and seven were underground rigs. Three of the underground rigs were dedicated to exploration and four were used for underground production ore delineation.

Exploration drilling in 2017 will comprise approximately 110,000 m from surface and underground to continue the successful 2016 program.

KLG plans on utilizing eight diamond drills for both exploration and definition drilling. Five of those drills will be on surface and three will be underground.

The mineralization on the property follows the east-west strike of the Main Break, which also dips steeply to the south. The South Mine Complex follows the same strike but the various lenses may dip shallow or steeply. Drilling in the area best intercepts the zone when drilling from the south towards the north.

All underground drillhole collars and lines are digitally surveyed before and after to accurately locate the holes. Surveys are completed down the holes near the collar and at 50m increments to track any changes. There are minimal variations to the movement of the drillhole trace, but factors such as rock quality and fabric may affect the direction.

Underground drillholes are planned with an expected target depth in mind. After the target is reached, the drillhole planner also adds an extra buffer zone to increase the confidence in intercepting the zone. When the end of hole depth is reached, the drilling contractor ends the hole and moves on to the next usually without confirmation from the Geology Department. On surface, drillholes are confirmed by the geologist before stopping to commence a new hole.

10.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

10.1 Sampling Methods

Diamond drill core samples, chip samples and muck samples are all used at Macassa for grade control. Only the core samples and the chip samples are used resource and reserve determination.

Diamond drilling is used to explore the extensions of the zones to find new zones from both surface and underground and to provide sample data between the mine levels for resource and reserve resource and reserve determinations. The recovered drill core is logged and sampled by a Geologist employed by KLG in Macassa's facility at the mine site. The core is oriented and marked for sampling by the geologist. Individual samples are never greater than 1 m in length and never less than 0.3 m in length. For all exploration core (and some definition core), the intervals selected for sampling are tagged and cut in half by a diamond saw, by a designated core splitter employed by KLG. One half of the split core is retained in the core box and stored in a designated area on site for further consideration. The other is placed in properly marked sample bags with the identifying tag for shipment to the laboratory. In the case of the exploration samples, they are currently being sent to Swastika Laboratories (Swastika, ON). The collars of all diamond drill holes are surveyed and the holes are surveyed down the hole.

The chip samples are obtained underground by a geologist or by a trained sampler. Each new exposure of the zones on the walls or face is sampled in all of the workings. Sample intervals are marked across the face and walls in channels recording the length, rock type and features of the sample. The sample intervals are set so that the individual veins and the waste sections within the veins are sampled separately. The wall rocks at the sides of the veins are sampled separately from the veins. The sample length for chips samples range between 0.3 and 1.0 m in length. The samples are tagged and placed in appropriately marked bags and transported to the laboratory. The samples are marked and located using the survey markers for control.

After a round is blasted underground and also long hole stopes where access to personnel is restricted for safety, the mining or mucking crew will obtain muck samples from the freshly blasted round. KLG practices dictates that one random grab sample from the muck be taken for every 10 tonnes of muck. These samples serve to gauge the mill feed and to confirm the chip sample results. Muck sampling of all the workings, development and stopes is now carried out for mining control and reconciliation purposes.

All chip and muck samples are tagged and placed in appropriately marked sample bags and then transported to the Macassa laboratory. At the lab, they are reduced in size by riffling before being treated by the standard assay procedures.

10.2 QC/QA Comparative Assay Laboratory Program.

KLG engages in industry standard practices to re-test mineralized rejects at a second commercial lab for a check on the quality of the primary assay results. Approximately 5% of the mineralized exploration samples that go directly to a commercial lab are sent to another commercial lab for verification.

As a standard procedure, all exploration samples that assay above 8.57 g/t Au or 0.25 oz Au/ton are subjected to multiple re-assaying as a check on the particular intersection.

10.3 Macassa Assay Method

The Macassa Mine has an assay laboratory associated with the milling complex. This laboratory assays all of the mill samples, bullion and mine samples. The exploration samples from the drilling programs are sent to the Swastika Laboratory (Swastika, ON) for analysis.

In the past, other labs were used on a regular basis however, arrangements have been made with Swastika, the main lab used and the most consistent, to allow for timely analysis of the cores. From time to time samples are sent to other labs for convenience. Check assaying is done at each of the labs used.

The sampling, handling and assaying methods used at KLG are consistent with good exploration and operational practices.

At the Macassa Laboratory, the prepping procedure for samples is as follows:

- Crushed to 3 mm;
- Riffle split to a 200-250 g sample;
- Pulverized with 90-95% passing 200 mesh screens.
- The pulverizer and crusher are cleaned by compressed air after each sample.

Normal fire assay procedures are employed, using either 1 assay ton for core or ½ assay ton for the other mine samples. There are procedures in place for repeating the fusion if the button is too small or too large.

10.4 Results

Assay results are reported to the senior geologist on the project. The senior geologist verifies the data ensuring all QC protocols were in compliance with expectations before entering the data into the database.

10.5 QC/QA Macassa Mine Assay Lab

The Macassa assay laboratory follows industry standard protocols for sample preparation and assaying. The lab inserts QC /QA standard samples, barren samples and a duplicate with each batch to test that proper procedure is being followed for quality control.

10.6 Assay Laboratory Site Audits

Analytical labs used by the Exploration group are routinely inspected and a more detailed lab audit was conducted by Analytical Solutions Ltd in December 2015. Recommendations from the audit concluded that the Macassa Laboratory is in a challenging location with limited space to operate, no digital data management and tight turnaround time requirements. Based on the available quality control data, the laboratory team produces good quality gold fire assays suitable for most mine applications. The gold is generally described as less than 25 microns (with particles up to 5 mm possible) so that pulps are relatively homogeneous and assays are repeatable.

The mine laboratory receives mostly muck and “stope” samples (some of which are chip samples). These sample types are notoriously biased and representative samples are difficult to achieve. Although the data are useful for long-term reconciliation and ore-waste discrimination, high precision assaying will not make the results more reliable. As a result most mine laboratories, including Macassa, focus on providing reasonably accurate results and focus on meeting 8-hour turnaround times.

In contrast, whole core is assayed for underground drill holes and additional quality control is in place. A reference material is included in each fire assay batch and pulps are submitted for check assays. In addition, geologists submitted reference materials with core in 2015.

There are several improvements that could be implemented at the laboratory but have significant costs associated with them. These include:

- Replacement of the multi-pass crushing and splitting process with a Boyd crusher/built-in rotary splitter (estimated cost $85,000),

- Purchase of an Agilent MP4200 microwave plasma - atomic emission spectrometry to replace the older AAS (estimated cost US$45,000 but much lower operating costs),

- Implementation of a Laboratory Information Management System (LIMS; estimated cost $80,000).

In March 2017, an assay laboratory audit was conducted by Analytical Solutions Ltd. (Lynda Bloom), of the Macassa, Holt and Swastika Laboratories.

An examination of the Quality Control data for a total of 436 reference material samples analyzed at the Macassa laboratory is found below in Table 10-1 which indicates a 98.9% average acceptance level. "Outliers" are suspected errors in recording the correct reference material sample in the database. Table 10-2 summarizes the reference material samples (384 samples) for Macassa Exploration core samples which were analyzed by Swastika Laboratories, a 99.4% average acceptance level was reported.

Reference Materials

RM	N	Outliers Excluded	Failures Excluded	Au g/t		Observed Au g/t		Percent of Accepted
				Accepted	Std. Dev.	Average	Std. Dev.	
OREAS 257	11	5	-	14.181	0.264	14.170	0.872	99.9%
OREAS 216	92	9	-	6.655	0.160	6.487	0.305	97.5%
OREAS 215	47	4	-	3.543	0.100	3.368	0.211	95.1%
OREAS 214	45	4	-	3.031	0.080	3.002	0.126	99.0%
OREAS 210	23	2	-	5.486	0.150	5.281	0.285	96.3%
OREAS 208	63	1	-	9.248	0.440	9.364	0.584	101.2%
OREAS 17C	44	5	-	3.040	0.080	3.153	0.178	103.7%
OREAS 16a	21	4	-	1.810	0.060	1.730	0.101	95.6%
OREAS 12a	90	9	-	11.790	0.240	11.749	0.531	99.7%
Total	**436**					**Weighted Average**		**98.9%**

Table 10-1: Reference material statistics – Macassa Laboratory

Reference Materials

RM	N	Outliers Excluded	Failures Excluded	Au gpt		Observed Au gpt		Percent of Accepted
				Accepted	Std. Dev.	Average	Std. Dev.	
OREAS 216	49	-	-	6.660	0.160	6.516	0.072	97.8%
OREAS 215	49	-	-	3.540	0.100	3.466	0.054	97.9%
OREAS 210	23	-	1	5.490	0.150	5.331	0.078	97.1%
OREAS 208	92	-	-	9.250	0.440	9.347	0.224	101.1%
OREAS 206	50	-	-	2.200	0.080	2.176	0.056	98.9%
OREAS 17C	50	-	-	3.040	0.080	3.084	0.045	101.5%
OREAS 16a	25	-	-	1.810	0.060	1.753	0.033	96.8%
OREAS 12a	46	-	2	11.790	0.240	11.787	0.272	100.0%
Total	**384**					**Weighted Average**		**99.4%**

Table 10-2: Reference material statistics for Exploration core samples – Swastika Laboratory.

11.0 DATA VERIFICATION

Drillhole data is verified by the exploration geologists and consists of a wide variety of checks based upon the survey and pick-up of drillhole collars, downhole surveys using Reflex® EZ-SHOT and EZ-TRAC tools during the drilling of the holes and gyro surveys after the completion of the holes. The drillhole trace is continually monitored by the Geologist to ensure that the hole remains on track to intercept the target.

Drillhole data is checked by the resource geologist prior to generating the mineral resource estimate.

12.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Metallurgical testing in 2010 indicated that the addition of oxygen to the process appears to be sufficient to maintain the recovery factors and this modification has been made.

It should be noted that the apparent increased telluride content that was observed in the SMC zones indicated that modifications to the processing may be required to keep the high gold recovery that has traditionally been experienced at Macassa; to that effect, cyanidation is taking place at the grinding stage.

Assumptions used for mill recovery are based on a grade-recovery curve that has been developed over the years; this grade-recovery curve is updated yearly.

13.0 MINERAL RESOURCE ESTIMATES

The Mineral Resources effective as of December 31, 2016 are summarized in Table 13-1. All mineral resources are exclusive of the mineral reserves.

	Measured			Indicated			Measured + Indicated			Inferred		
	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)	Tonnes (kt)	Grade (g/t)	Cont. Gold (koz)
Main / '04 Break	871	16.16	452	766	17.95	442	1,637	17	894	324	17.54	183
SMC	27	18.19	16	294	24.23	229	321	23.72	245	850	23.93	654
Other Zones	9	18.29	5	510	10.85	178	519	10.98	183	248	11.06	88
Grand Totals	**907**	**16.24**	**473**	**1,570**	**16.82**	**849**	**2,477**	**16.61**	**1,322**	**1,422**	**20.23**	**925**

Notes
CIMM definitions (2014) were followed in the calculation of Mineral Resource
Mineral Resources are reported Exclusive of Mineral Reserves
Mineral Resource estimates were prepared under the supervision of D. Cater, P. Geo.
Mineral Resources were estimated at a block cut-off grade of 8.57 g/t Au or 0.25 opt.
Mineral Resources are estimated using a gold price of C$1,500/oz
A minimum mining width of 1.83m or 6' Horizontal Mining Width ("HMW" used on the '04 Break) or 2.74m or 9' vertical Mining Height ("VMH" used on the SMC shallow dipping veins) was applied
A bulk density of 2.74 t/m^3 or 11.7 cu. ft. was used
Totals may not add exactly due to rounding

Table 13-1: Mineral Resources for the Macassa Mine (as of Dec 31, 2016).

13.1 Database

SQL drill hole database managed through Flairbase Corelog software with built in validation checks during data import/input. No "secondary" validation was completed for this update. Underground "Chip" sample data is stored digitally in CAD files as well as hard copies of plots are kept with the individual resource zone packages. Chip samples taken since November 2014 are all imported into an access database with earlier samples being added regularly to continue building the geological model. Again, data validation is done during the data import stage (i.e. No "secondary" validation).

13.2 Geological Interpretation and 3D Solid Modelling

Resource grade lenses, which make up the SMC zone were 3D modeled in 2016 for the purpose of transitioning towards block modeling however, these models were not used for this MRMR update. The rest of the 3D solid geological resource models are planned to be made throughout 2017 to be used for future MRMR updates.

13.3 Density Data

The density used to convert the volume of the blocks is 2.74 t/m^3 for all of the zones except the Lower D.

The Lower D Zone volumes were converted at a density of 2.78 t/m^3 as a result of the additional sulphides that are present.

The density traditionally used in the camp was 2.67 t/m^3. There have been a number of studies that suggest that the traditional density number was too low and consequently gave an understated tonnage. The difference in the tonnage estimate is only about 2.5% between the density used in the past and the current density being used. As this has been applied to all blocks, the changed density does not affect the reserve grades.

In 2007, 95 samples were used to measure the density of the SMC zones. These samples confirmed that the density used for the Lower D Zone was realistic. The other SMC zones varied and it appears that the 2.74 t/m^3 used overall at Macassa is reasonable. The tonnage difference between 2.74 t/m^3 and 2.78 t/m^3 is less than 2%. This difference is well within the estimation accuracy of the MRMR estimates

13.4 Assay Composites

The capping system currently in use is based on a Kinross report by B. Davis (1995). It appears that this single cap method gives much the same results as the old system. As new ore is found in different settings the capping procedure may need to be modified.

The effect of grade capping can only be truly examined when a large tonnage has been mined and the recovered gold can be compared with the forecast for that period. Grade capping, or cutting, is necessary at Macassa. The capping practice for the main zones has also been used on some of the zones in the SMC. Assays higher than 3.5 oz Au/ton are cut to 120 g/t Au or 3.5 opt. Some of the zones in the SMC have grades much higher than normally found in the main zones. This increased grade is also associated with a different style of mineralization. Initial investigation by the company's geological staff indicated that the historic cutting factor of 3.5 opt was understating the grade of mineralization for the SMC.

The consulting firm of Scott Wilson Roscoe Postle Associates Inc. (SWRPA) was retained to investigate, by statistical analysis, 10 of the larger mineralized zones forming part of the SMC. They concluded that there were sufficient data points for a statistical analysis of seven of the 10 zones reviewed. As a result, KLG has implemented various higher grade cutting factors for four of the seven zones. These four zones are New South Zone (246.86 g/t or 7.2 opt), Lower D North (318.86 g/t or 9.3 opt), Lower D North

Footwall (164.57 g/t or 4.8 opt), the #7 and #7 HW Zones (219.43 g/t or 6.4 opt). These revised capping levels are now being used on both drill hole assays and underground chip assays dates.

These revised cutting factors, based on the mean of the assays in the zone plus one standard deviation, are considered conservative and are lower than those recommended by SWRPA. Accordingly, the factors may be subject to upward revision as more data points are generated.

Revised factors for the other mineralized zones including the Lower D, White, YYZ, Freewill and Limelight will be implemented as more assay data are derived.

13.5 Block Model

Updates to the 2016 year end resource were completed using the modified polygonal method. As such, no block model is available for this update. While 81 shapes were wireframed within the South Mine Complex, they were not used for this update. Figure 13-1 illustrates the downward west view of modeled mineralized structures in the SMC, with the New South Zone (NSZ) in yellow. Note the dual orientations of structures, the shallow south east dips of the NSZ and associated structures, and the steep SE dips of structures below and to the SW, above which include the Lower D Zone and associated structures. In the blue lines are underground workings of 5300 Level.

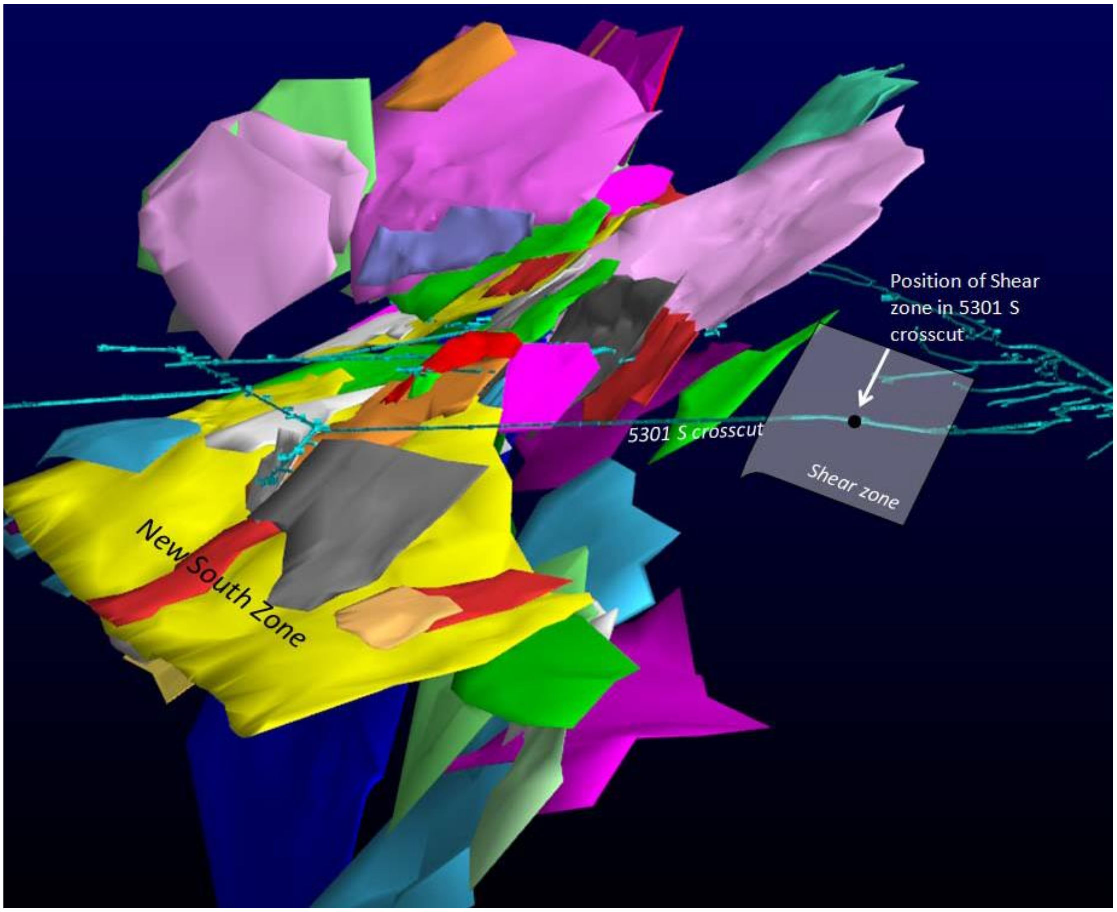

Figure 13-1 Resource wireframes for the SMC mineralized zones.

The recent Mineral Resource update continues to confirm the high-grade nature of the SMC zone at depth. Figure 13-2 depicts both the Proven and Probable Reserves and Measured and Indicated Resource tonnes sub-divided by mine level to depth. Average grades for the Reserves and Resources are shown on the right-hand side of the figure. Many of the mineralized zones that form the SMC merge with the Amalgamated Break zone below the 5800 level, however the Lower D zone which dips steeply south, has been drill tested and remains mineralized below the 7050 level.

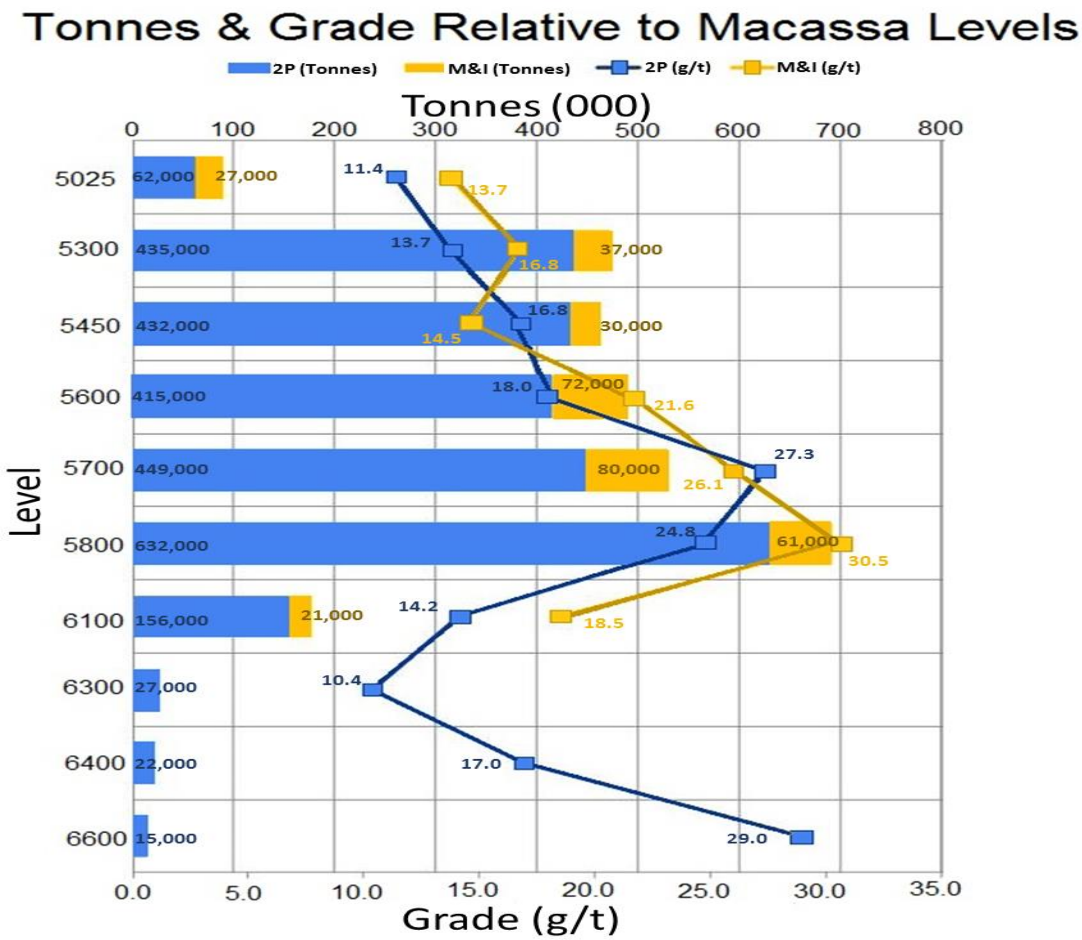

Figure 13-2 SMC Zone Mineral Reserve / Resource totals subdivided by level.

13.6 Resource Estimate and Classification

The models were classified as measured, indicated or inferred as outlined by NI 43-101 standards based on a few qualifying factors. The resource classification is essentially based on the density of drillhole information and the continuity of gold grades.

In the QP's opinion, there are no known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors that could affect materially the mineral resource estimate.

14.0 MINERAL RESERVES ESTIMATE

The Mineral Reserves effective as of December 31, 2016 are summarized in Table 14-1.

MACASSA MINE ZONE	**CATEGORY**	**TONNES**	**GRADE**	**OUNCES**
SMC	PROVEN	337,999	17.81	193,499
SMC	PROBABLE	2,076,118	22.63	1,510,457
MAIN BREAK	PROVEN	271,813	15.85	138,492
MAIN BREAK	PROBABLE	316,749	16.05	163,449
East End	PROVEN	0	0.00	0
East End	PROBABLE	0	0.00	0
Shaft Pillar	PROVEN	0	0.00	0
Shaft Pillar	PROBABLE	0	0.00	0
TOTAL	**PROVEN**	**609,812**	**16.93**	**331,990**
TOTAL	**PROBABLE**	**2,392,866**	**21.76**	**1,673,906**
TOTALS	**2 P'S**	**3,002,679**	**20.78**	**2,005,896**

Notes
CIM Definition Standards (2014) were followed in the estimation of Mineral Reserves.
Mineral Reserves were estimated using a long-term gold price of US$1,200/oz (CDN$1,500/oz).
Cut-off grades were calculated for each stope, including the costs of: mining, milling, General and Administration, royalties and capital expenditures and other modifying factors (e.g. dilution, mining extraction, mill recovery).
Mineral Reserves estimates were prepared under the supervision of P. Rocque, P. Eng.
Totals may not add exactly due to rounding.

Table 14-1: Mineral reserves for the Macassa Mine (as of Dec 31, 2016).

In the QP’s opinion, there are no known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors that could affect materially the mineral reserves estimate.

15.0 MINING METHODS

15.1 Design Criteria

Mine design is an ongoing, dynamic process. Whenever a new mining area is to be developed, such factors as the lithologies and geological structures in that area are taken into consideration, as well as the potential effect of mining on the stress field, and any consequent potential for seismic activity.

Stopes are designed to be mined using selective methods that open the ground gradually and give it a chance to react to the opening. Thus, the mining methods considered are variations on cut and fill, and any longhole is as necessitated by the need to recover pillars, and is also executed on a small scale.

15.2 Mining Shapes

Mineral resources were modelled by geology personnel using the polygonal method. Mining shapes were created by engineering personnel within the Measured or Indicated Resource shapes on sections.

The mining shapes were provided to the geology personnel who estimated the tonnage and grade of the material contained within the shapes, including external dilution (i.e. overbreak). Upon receiving the information, engineering personnel apply a mining extraction factor to estimate the stope production statistics. The economic viability of each resulting stope is assessed independently and only the ones that return a positive cash flow are included in the mineral reserves statement.

15.3 Mining Method

15.3.1 Paste Cut and Fill (PCF)

PCF stopes are accessed via a two-compartment, timbered manway. One compartment is a timbered ladderway, and the other is a wooden slide for moving equipment and supplies. Ore is drilled off with a jackleg and breasted down. The muck is then moved, using a slusher, into a millhole with a chute at the bottom so the ore can be trammed to the central ore pass system. After a cut is completed, a slot is driven to begin the next cut before pastefilling. Maximum slushing distances are about 45 m, so a centrally located millhole is optimal.

Drive layouts for PCF stopes usually indicate a minimum mining width; however, the ground support standards allow the width to be increased to recover all the ore. Elevation is usually under Survey control.

PCF stope productivity is lower compared to other methods, but these stopes are generally quicker to start producing from, as there is minimal development required before mining begins on each cut.

15.3.2 Mechanized Cut and Fill (MCF), including Drift and Fill

Personnel, equipment, and supplies are brought into MCF stopes by attack cross cut (ATXC) with mechanized equipment. Ore is drilled off with a jackleg or longtom drill and breasted down, advancing 1.8 to 2.4 m per blast. The muck is removed from the stope using Load-Haul-Dump equipment (LHD) via the ATXC and dumped into a local ore pass connected to a chute above a tracked drift and trammed to the central ore pass to be hoisted to surface. The LHD can also dump directly to an ore car for tramming.

When a cut is completed, waste fill is placed wherever there is no ore in the floor, and at least 1.5 m from any wall that contains ore, a fill wall is built, and pastefill is poured. The next cut is mined above or beside the current cut, depending on the ore configuration and the agreed-upon mining sequence.

Several cuts can be taken from a given ATXC, depending on its length. MCF stopes are more productive than PCF, but have higher development costs, as ramps and ATXCs have to be driven at a safe stand-off distance from the orebody.

Ground support standards allow for mining up to 12 m wide and 7 m high. Generally, however, widths are kept below 9 m, and widths in excess of that are usually mined drift-and-fill, by backfilling the stope and mining beside it at the same elevation. Drift and fill is also used for mining shallow-dipping orebodies, where the next slice is taken either up-dip or down-dip of the current cut, but beside and not over or under it.

15.3.3 Underhand Cut and Fill (UCF), including Drift and Fill

When the ore extends below a sill cut, and it is not practicable to mine drift-and-fill downdip, a UCF method is used. As with MCF, personnel, equipment, and supplies are brought into UCF stopes by attack cross cut (ATXC) with mechanized equipment. Ore is drilled off with a jackleg or longtom drill and taken in rounds under the paste fill, advancing 1.6 m to 2.4 m per blast. The muck is removed from the stope using LHD equipment via the ATXC and dumped into a local ore pass connected to a chute above a tracked drift and trammed to the central ore pass to be hoisted to surface. The LHD can also dump directly to an ore car for tramming.

When a cut is completed, another cut or partial cut may be taken by benching, or the current cut will be backfilled. A sill mat, made up of rebar, is installed on the floor. The rebar is “standing” on the floor, supported by wires running the width of the cut and secured to the walls until the pastefill cures. The fill mat is only required in those areas that will be mined beneath. For this reason, careful records are kept of fill mat locations and extents. Rock fill can be placed in those areas with no fill mat. As with MCF, it is possible to mine beside a UCF cut.

This method is labour-intensive as a sill mat needs to be constructed before the fill cycle can begin. This method is, however, favourable in seismically active ground, since it produces an engineered back, and stresses concentrate in the direction of advance, being the floor.

For the most part, UCF is used to define the footwall of a wide, shallow-dipping ore zone. Once the initial full-height panel has been defined, the preference is to mine the remainder of the down-dip end of a stope by overhand MCF drift and fill.

15.3.4 Panel Draise Mining

This method is sometimes used to mine narrow ore blocks, that dip too steeply to drive a mechanized ramp up-dip in ore, but too shallowly to drive a raise up-dip in ore, thus the hybridized label, “draise”. It involves mining up-dip along an ore structure, then benching or backslashing the remainder of the ore and slashing out the pilot along strike to a maximum width. The panel is then pastefilled, and the process is repeated immediately adjacent.

Panel widths are kept to within ground control standard support widths (about 6 m). Lateral direction tends to be controlled by Survey, while Geology controls the grade.

Movement of muck from the upper part of the panel to the slusher drift below can be enhanced with steeper dips. A ladderway is often installed on one side of the panel via a pilot draise driven before the rest of the panel is slashed into it so the workers can climb up from the access drift below. Pilot draises should be driven right next to the previous panel after the panel has been paste filled to avoid the creation of a rib pillar.

Panel sequencing should be such that the sequence mines towards abutments, which are capable of absorbing stress transfers, instead of a sequence that creates a high stress diminishing pillar, which will become burst prone. This pillar eventually becomes non-recoverable.

15.3.5 Shrinkage

Shrinkage stopes were used where it was not feasible to paste fill, usually for lack of access to a filling system and strike length under 30 m. Access and blasting is similar to the other Cut and Fill methods, except that only enough muck is removed to allow enough room to continue with the next cut. When the stope reaches its final height, all remaining muck is removed.

15.3.6 Pillar removal

When it is necessary to mine the ore in a sill or post-pillar, an individual design is made. Most often, especially if the pillar is not failed and is highly stressed, it is necessary to use a longhole method to mine the remnant ore. Pillar removals are designed on a case-by-case basis, as the geometry and access regimes vary greatly.

15.4 Geomechanical

All newly opened ground must be supported before anyone is permitted to enter the newly-opened area. A one hole/one bolt policy is followed when installing initial primary ground support. This means that one hole is drilled and then a bolt is installed into it, with no pre-drilling of holes. All back support is installed to within 0.3 m of the working face and screen is pinned to within 1 m of the sill, except while excavating PCF slots.

The minimal support standards for backs in rock are based on the calculation of safety factors for wedges formed by 2 joints at 45^0 and 2 joints at 90^0 with the back. It is recommended to have a minimum safety factor of 1.2 for short term heading and 1.5 for long term. If joints steeper than 45^0 are encountered, the ground support has to be re-evaluated on a case-by-case basis.

There are 5 support classes at Macassa (Figure 15-1). Generally, the length of the longest ground support will be at least one third of the back or wall span. The support classes are as follows:

A – Overhand cut and fill drift and fill and short term waste headings

C - Long term waste headings

D - Both short term and long term rock-burst prone headings

U – Underhand Cut and Fill Stopes including underhand drift and fill

R - Conventional raise headings

The summary, which gives details for each class, follows.

Within each class (except Class U), the support types and patterns vary for four different span ranges - up to 3.7 m, >3.7 m to 5.5 m, >5.5 m to 7.6 m, and >7.6 m to 12 m. These support classes are all similar, in that they require bolts to be installed on a 1.2 m by 1.2

m Dice 5 Pattern. The variation is on the type of support elements used from class to class, and the length of support from span to span.

For Class U and where there is paste in the back or walls, it is the span of the rock that is considered.

KL GOLD MINIMUM SUPPORT STANDARDS

BACK SUPPORT AT INTERSECTIONS FOR ALL CLASSES: Maximum circular span at intersections dictates the ground support to be used: e.g. Max. Circular span > 18', < 25' Class C: install 8ft rebar + 10ft spin cable bolts	**FILL IN BOLTS FOR ALL CLASSES:** secondary bolting (min 4') must correspond in type, provided the Primary Support is in place and authorization has been given by frontline supervisor.	**NOSE & BROW STRAPPING FOR ALL CLASSES**: Minimum 2 lines x "0" gauge straps installed with corresponding bolt type	**NOTE**: a Stoper must be utilized to install ground support into the back.	**SPLIT SETS**: 39mm split sets should only be installed in paste. Only 35mm split sets can be installed in rock, and only when ground is too broken to install rebar or rock bolts. In this case they must be installed on a 2 x 2 dice 5 pattern.	**FACE SUPPORT FOR ALL CLASSES:** all faces must be bolted before drilling the face to be blasted. Use 5 foot rebar or 5' split sets. 1 row of 2 bolts about evenly spaced for 9' x 9' face, about 3-4' from back or crest of bench. Add 1 row of bolts for every additional 3 feet of height, and 1 bolt per row for every additional 3 feet of width.

OVERHAND CUT-AND-FILL, DRIFT-AND-FILL & SHORT TERM WASTE HEADINGS:

All ground support is to be installed to within 1ft of the working face. Ensure screen at face is held tightly to the irregularities in the rock profile to protect from blast damage.
One hole/One bolt policy must be followed when installing initial primary ground support.
Welded mesh is to be pinned (with required BACK/WALL support) to within 3ft of the sill, ensure 1ft screen overlap.
If supporting a rock/paste contact, chain link mesh must overlap a minimum of 1ft onto rock. Chain link mesh may be used in place of welded mesh.
PCF Stopes only: Welded mesh to be installed at least 3ft down from the back, with bolts installed 3ft up from the sill, regardless of mesh installation.
A wall slash within one round of the current face can be considered a working face, where full pattern bolting minus the screen is allowed. Written authorization from the frontline supervisor is required.

CLASS **A**

	OPENING SIZE	SUPPORT TYPE	PATTERN	SCREEN TYPE
BACK	Span Up to 12'	5ft Mechanical bolts	4' x 4' DICE 5	4" Welded mesh required
BACK	12' < Span ≤ 18'	8ft Mechanical bolts	4' x 4' DICE 5	4" Welded mesh required
BACK	18' < Span ≤ 25'	8ft Mechanical bolts + 10ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	4" Welded mesh required
BACK	25' < Span ≤ 40'	8ft Resin rebar bolts + 15ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	4" Welded mesh required
ROCK WALL	TOTAL height up to 15' from roadway/walkway	5ft Mechanical bolts *	4' x 4' DICE 5	4" welded mesh required
ROCK WALL	24'≥TOTAL height >15' from roadway/walkway	8ft Mechanical bolts	4' x 4' DICE 5	4" welded mesh required
PASTE WALL	PASTE height up to 18' exposed	5'6" 39mm Split Sets	4' x 4' DICE 5	2" Chain link mesh required
PCF SLOT	ADDITIONAL BROW and NOSE PILLAR SUPPORT: Minimum 2 lines "0" gauge screen straps installed with corresponding bolts at 4ft spacing			
PCF SLOT	WALL BOLTS: Where height >15' and not enough room to install longer bolts, 5ft Mechanical bolts can be used			
PCF SLOT	WALL SCREEN (prior to fill prep): Final screen installation to within 5ft of the sill			

* Where mining 5 feet wide, use 4ft Mechanical bolts in the wall.

WASTE HEADING – LONG TERM

All ground support is to be installed to within 1ft of the working face. Ensure screen at face is held tightly to the irregularities in the rock profile to protect from blast damage.
One hole/One bolt policy must be followed when installing initial primary ground support
Chain link mesh is to be pinned (with required BACK/WALL support) to within 3ft of the sill, ensure 1ft screen overlap
A wall slash within one round of the current face can be considered a working face, where full pattern bolting minus the screen is allowed. Written authorization from the frontline supervisor is required.
Where a secondary face is planned for, temporary Class A support may be installed in the area that is to be blasted. Written authorization from the frontline supervisor is required.

CLASS **C**

	OPENING SIZE	SUPPORT TYPE	PATTERN	SCREEN TYPE
BACK	Up to 12'	5ft Resin rebar bolts	4' x 4' DICE 5	2" Chain link mesh required
BACK	>12', ≤ 18'	8ft Resin rebar bolts	4' x 4' DICE 5	2" Chain link mesh required
BACK	>18', ≤ 25'	8ft Resin rebar bolts + 10ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	2" Chain link mesh required
BACK	>25', ≤ 40'	8ft Resin rebar bolts + 15ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	2" Chain link mesh required
WALL	Height up to 15' from roadway/walkway	5ft Resin rebar bolts	4' x 4' DICE 5	2" Chain link mesh required
WALL	15' < Height ≤ 24' from roadway/walkway	8ft Resin rebar bolts **	4' x 4' DICE 5	2" Chain link mesh required
	** Where not enough room: Install 5ft Resin rebar bolts at a 4' x 4' square pattern plus 10ft spin cable bolts at the middle to form a Dice 5 pattern			
	ADDITIONAL BROW SUPPORT: Minimum 2 lines x "0" gauge screen straps installed with Rebar bolts at 4ft spacing			

ROCK BURST PRONE HEADINGS

All ground support is to be installed up to the working face.
Ensure the final edge of the screen at face is held tightly to the irregularities in the rock profile and cone bolted with 0 gauge, 12" x 12" mesh backer plates.
One hole/One bolt policy must be followed when installing initial primary ground support
Chain link mesh is to be pinned (with required BACK/WALL support) to within 3ft of the sill, ensure 1' screen overlap

CLASS **D**

	OPENING SIZE	SUPPORT TYPE	PATTERN	SCREEN TYPE
BACK	Up to 12'	5'6" Cone bolts + 5' Resin rebar bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	2" Chain link mesh required "0" gauge straps with cone bolts at screen overlap
BACK	>12', ≤ 18'	7'6" Cone bolts + 8' Resin rebar bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	2" Chain link mesh required "0" gauge straps with cone bolts at screen overlap
BACK	>18', ≤ 25'	7'6" Cone bolts + 10ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	2" Chain link mesh required "0" gauge straps with cone bolts at screen overlap
WALL	Height up to 15' from roadway/walkway	5'6" Cone bolts + 5' Resin rebar bolts	4' x 4' DICE 5 (middle bolt to form Dice 5)	2" Chain link mesh required "0" gauge straps with cone bolts at screen overlap

UNDERHAND CUT-AND-FILL STOPES, INCLUDING UNDERHAND DRIFT-AND-FILL

All ground support is to be installed to within 1ft of the working face. Ensure screen at face is held tightly to the irregularities in the rock profile to protect from blast damage.
One hole/One bolt policy must be followed when installing initial primary ground support.
Screen is to be pinned (with required BACK/WALL support) to within 3ft of the sill, ensure 1ft screen overlap.
If supporting a rock/paste contact, chain link mesh must overlap 1ft onto rock. Chain link mesh may be used in place of welded mesh.
A wall slash within one round of the current face can be considered a working face, where full pattern bolting minus the screen is allowed. Written authorization from the frontline supervisor is required.

CLASS **U**

	OPENING SIZE	SUPPORT TYPE	PATTERN	SCREEN TYPE
ROCK BACK	ROCK span < 10', total span ≤ 25'	8ft Mechanical bolts	4' x 4' DICE 5	4" Welded mesh required
ROCK BACK	10'≤ ROCK span ≤ 25', total span ≤ 25'	8ft Resin rebar bolts + 10ft Spin cable bolts	4' x 4' DICE 5 (middle bolt to form a Dice 5)	4" Welded mesh required
PASTE BACK	PASTE span Up to 18' (fill mat required)	4' 39mm Split Sets	4' x 4' DICE 5	2" Chain link mesh required
ROCK WALL	TOTAL height up to 15' from roadway/walkway	5ft Mechanical bolts	4' x 4' DICE 5	4" Welded mesh required
ROCK WALL	15'<TOTAL height ≤ 24' from roadway/walkway	8ft Mechanical bolts	4' x 4' DICE 5	4" Welded mesh required
PASTE WALL	PASTE height Up to 18' (fill mat required)	5'6" 39mm Split Sets	4' x 4' DICE 5	2" Chain link mesh required
	SCREEN OVERLAP of the two types of screen must be done on the rock and pinned with corresponding bolts. Chain link mesh may be used in place of welded mesh.			

CONVENTIONAL RAISE HEADINGS

All support is to be installed to within 1ft of the working face
One hole/One bolt policy must be followed when installing initial primary ground support

IF RAISE OVER 70º:
ALL SIDES MUST BE SUPPORTED

CLASS **R**

SIZE	SUPPORT TYPE	PATTERN	REMARKS
Up to 6' x 6' over 45º	4ft Mechanical bolts	4' x 4' DICE 5	FACE SUPPORT (Prior to drilling the round) Weld mesh + 4ft Mechanical bolts forming a DICE 5 pattern
Up to 6' x 6' under 45º	4ft Mechanical bolts	4' x 4' DICE 5	The face should be check scaled to minimize loose conditions
>6' x 6', ≤10' x 10' over 45º	5ft Mechanical bolts	4' x 4' DICE 5	FACE SUPPORT (Prior to drilling the round) Weld mesh + 5ft Mechanical bolts forming a DICE 5 pattern
>6' x 6', ≤10' x 10' under 45º	5ft Mechanical bolts	4' x 4' DICE 5	The face should be check scaled to minimize loose conditions
MANWAYS SUPPORT (AFTER DRIVING THE RAISE)			
Up to 6' x 6'	4ft Forged head rebar	4' x 4' DICE 5	2" Chain link mesh required
>6' x 6', ≤10' x 10'	5ft Forged head rebar	4' x 4' DICE 5	2" Chain link mesh required
MUCK PASS RAISES			
≤10' x 10'	5.5ft Spin Cables	4' x 4' DICE 5	FACE SUPPORT (Prior to drilling the round) Weld mesh + 5ft Mechanical bolts forming a DICE 5 pattern

BROW SUPPORT: Minimum 2 lines x "0" gauge screen straps installed with Rebar bolts at 4ft spacing

U:\Ground Control, Ground Support Procedures\Ground Support Policy Nov 2013\GsPolicySummary - Sept 2014.docx January, 2015

Figure 15-1: Ground support standard for development headings.

15.5 Mine Access and Development

The mine is accessed primarily by #3 Shaft. #2 Shaft is only accessible from 4250 and 4500 levels. #3 Shaft extends to a depth of 2,226 m below surface, but is only accessible to approximately 15 m below 5725 L (approximately 1,745 m depth). The main levels are driven from the shaft at intervals ranging from 38 m to 131 m. Levels are named for their approximate depth (in feet) below surface. The main operating levels are 3400 L, 3800 L, 4250 L, 4500 L, 4750 L, 4900 L, 5025 L, 5150 L, 5300 L, and Loading Pocket on 5150 L and 5725 L. 5450 L shaft station has been paste filled and there is no access to the level from #3 Shaft, although there is access to 5450 L from the 5737 Bored Access Raise (BAR). The 5600 L is not regularly used as a production level. Average drift dimensions are 2.4 m wide by 2.4 m high. #3 Shaft is not used below the 5725 L loading pocket due internal damage caused by a rock burst in 1997, and that area of the mine remains flooded below 5725 L for the time being.

The South Mine Complex (SMC) is currently accessed by two cross cuts extending approximately 457 m south-east from the Main Break, one each on 5025 L and 5300 L. There is a haulage ramp that extends from #3 Shaft at 5025 L to below the SMC at the equivalent of 5725 L, with an orepass and wastepass just below 4900 L. The ramp is planned to go to the equivalent of 5875 L.

Development requirements are shown in Table 15-1.

	DEVELOPMENT METERS										
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Total Capital	9,854	9,896	9,896	9,896	9,896	9,896	9,896	9,896	9,896	9,896	10,785
Total Operating	5,986	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965
Total Development	15,840	15,862	15,862	15,862	15,862	15,862	15,862	15,862	15,862	15,862	16,750

Table 15-1: Development requirements.

15.6 Capital Development

Details of capital development are listed in Table 15-2.

DEVELOPMENT METERS												
		2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
CAPITAL	RAISES	610	608	608	608	608	608	608	608	608	608	1,497
	RAMPS	3483	3502	3502	3502	3502	3502	3502	3502	3502	3502	3502
	LATERAL	4563	4587	4587	4587	4587	4587	4587	4587	4587	4587	4587
	LATERAL	677	680	680	680	680	680	680	680	680	680	680
EXPLORATION	LATERAL	115	115	115	115	115	115	115	115	115	115	115
	LATERAL	406	404	404	404	404	404	404	404	404	404	404
TOTAL CAPITAL		9,854	9,896	9,896	9,896	9,896	9,896	9,896	9,896	9,896	9,896	10,785

Table 15-2: Capital development.

15.7 Operating Development

Details of operating development are listed in Table 15-3.

DEVELOPMENT METERS												
		2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING	RAISES	121	120	120	120	120	120	120	120	120	120	120
	RAMPS	0	0	0	0	0	0	0	0	0	0	0
	LATERAL	3595	3583	3583	3583	3583	3583	3583	3583	3583	3583	3583
	LATERAL	17	17	17	17	17	17	17	17	17	17	17
	LATERAL	2253	2245	2245	2245	2245	2245	2245	2245	2245	2245	2245
TOTAL OPERATING		5,986	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965

Table 15-3: Operating development.

15.8 Equipment

The list of major mobile equipment is shown in **Table 15-4**. The various sizes of LHDs, longtoms and single/double boom jumbos are the primary development and production units at the Macassa Mine followed by locomotives with four tonne rail cars and battery and diesel trucks for transport of the ore to the shaft.

Kirkland Lake Gold Inc.				
Scoop/ Machine designation and location				
UNIT #	MODEL	Engine	Type	Stoping Block
LHD 111	Tamrock JS220/ 2 yrd 101.9 HP	DIESEL	Scoop	5156 Ramp
LHD 117	MTI LT210/ 1 1/4 yrd 54 HP	DIESEL	Scoop	4508 MCF / LH & 4204 MCF
LHD 118	MTI LT210/ 1 1/4 yrd 54 HP	DIESEL	Scoop	4235 MCF
LHD 119	MTI LT210/ 1 1/4 yrd 54 HP	DIESEL	Scoop	4225 MCF / LH
LHD 120	EJC 61E KLG/ 1 1/4 yd	ELEC.	Scoop	53L 5311 / 5411UCF
LHD 121	EJC 61E KLG/ 1 1/4 yd	ELEC.	Scoop	50L 5009 MCF / 5111 UCF
LHD 122	EJC 61E KLG/ 1 1/4 yd	ELEC.	Scoop	3422 MCF / UCF
LHD 123	EJC 60E RDH/ 1 1/4 YD	ELEC.	Scoop	54L 5612 MCF/UCF
LHD 124	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	50L 5012 / 5019 MCF
LHD 126	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	53L 5302 UCF
LHD 127	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	53L 5413 UCF
LHD 128	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	54L 5417 MCF/LH (Load/Out)
LHD 129	*EJC 60D RDH/ 1 1/4 yrd 68HP*	*DIESEL*	*Scoop*	*5006 MCF / 5111 UCF*
LHD 130	EJC 60D RDH/ 1 1/4 yrd 68HP	DIESEL	Scoop	53L 5411 UCF
LHD 131	EJC 61D RDH 1 1/4 yrd 78HP	DIESEL	Scoop	47L 4944 UCF
LHD 132	EJC 61D RDH 1 1/4 yrd 78 HP	DIESEL	Scoop	54L 5417LH
LHD 133	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	50L 5117 UCF
LHD 134	EJC 100E RDH/ 2.4 yrd	ELEC.	Scoop	50L 5106 UCF/DECLINE
LHD 135	EJC 61D RES 1 1/4 YRD.68 HP	DIESEL	Scoop	5356 Ramp (with Forks)
LHD 136	EJC 61D RDH 1 1/4 YRD.78HP	DIESEL	Scoop	4727 LH
LHD 137	LH 203 SANDVIK 2/YRD 80 HP	DIESEL	Scoop	50L 5033 MCF / UCF & 5038
LHD 138	LH 203 SANDVIK 2/YRD 80 HP	DIESEL	Scoop	53L Q Complex
LHD 139	LH 203 SANDVIK 2/YRD 80 HP	DIESEL	Scoop	54L 5412 / 5417 LH
LHD 140	LH 202 SANDVIK 1.5/YRD. 68HP	DIESEL	Scoop	53L 5404 L/O
LHD 141	LH 202 SANDVIK 1.5/YRD. 68HP	DIESEL	Scoop	50L 5120 LH
LHD 142	LH 202 SANDVIK 1.5/YRD. 68HP	DIESEL	Scoop	50L 5006 MCF
LHD 143	LH 202 SANDVIK 1.5/YRD. 68HP	DIESEL	Scoop	50L 5117 UCF
LHD 144	LH 202 SANDVIK 1.5/YRD.	ELEC.	Scoop	53L 5417 L/O
LHD 145	LH 202 SANDVIK 1.5/YRD.	ELEC.	Scoop	45L 4726UCF
LHD 146	LH 202 SANDVIK 1.5/YRD.	BATTERY	Scoop	34L 3422MCF/3427PCF
LHD 147	LH 202 SANDVIK 1.5/YRD.	ELEC.	Scoop	3422 MCF / UCF
LHD 148	LH 202 SANDVIK 1.5/YRD.	ELEC.	Scoop	42L 4204MCF
LHD 149	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5312 MCF
LHD 150	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	54L 5418 Ramp (54L 5412 / 5409W)
LHD 151	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	54L 5417 / 5412
LHD 152	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5312 MCF
LHD 153	MTI LT 210/ 1 1/4 yrd 54 HP	DIESEL	Scoop	3427 PCF
LHD 154	MTI LT 210/ 1 1/4 yrd 54 HP	DIESEL	Scoop	5135 MCF / LH
LHD 155	EJC 61D RDH 1 1/4 YRD.68HP	DIESEL	Scoop	4716/4727 Ramp
LHD 157	MTI LT 210/ 1/14 yrd (ELEC)	ELEC.	Scoop	50L 5006 MCF
LHD 158	MTI LT 210E 1/14 yrd (ELEC)	ELEC.	Scoop	54L 5409 E MCF
LHD 159	LH203E SANDVIK 2/YRD	ELEC.	Scoop	53L 5309 S/T#1 L/O
LHD 160	LH203E SANDVIK 2/YRD	ELEC.	Scoop	53L 5402 L/O
LHD 161	LH203D SANDVIK 2/YRD 80 HP	DIESEL	Scoop	53L 5313 L/O
LHD 162	LH203D SANDVIK 2/YRD 80 HP	DIESEL	Scoop	53L 5412LH / 5413 UCF
LHD 163	LH203D SANDVIK 2/YRD 80 HP	DIESEL	Scoop	50L 5019 MCF
LHD 164	LH203D SANDVIK 2/YRD 80 HP	DIESEL	Scoop	5320/5330 Q Complex
LHD 165	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5402
LHD 166	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5403 / 5404E UCF
LHD 167	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5409 UCF
LHD 168	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	53L 5404/5403 UCF
LHD 169	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	54L 5406 MCF
LHD 170	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	50L 5133 UCF
LHD 171	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	5320/5330 Q Complex
LHD 172	EB 300 BATTERY 3 YRD. RDH	BATTERY	Scoop	5418 DECLINE
TRK 201	EJC-415TDT JARVIS CLARK 185 HP	DIESEL	ENG. S/N 8185911 185	5356
TRK 203	800 20EB BATTERY TRUCK. RDH	BATTERY	Truck	Ramp
TRK 204	800 20EB BATTERY TRUCK. RDH	BATTERY	Truck	Ramp
TRK 205	800 20EB BATTERY TRUCK. RDH	BATTERY	Truck	Ramp
TRK 206	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
TRK-207	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
TRK-208	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
TRK #4	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
TRK #5	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
TRK #6	MT 2010 Atlas Copco Battery Truck	BATTERY	Truck	Ramp
JUM 002	Atlas Copco T1D BOOMER		jumbo	53L Q Complex
JUM 003	Atlas Copco T1D BOOMER		jumbo	5618 Decline
Jum 004	Atlas Copco 282 2 Boom Jumbo		jumbo	5718 Decline, 57 & 58 Levels
Jum 005	Atlas Copco T1D BOOMER (used)		jumbo	54L 5402, 5403, 5404 Stopes
Jum 006	Atlas Copco T1D BOOMER (new)		jumbo	56L 5602, 5603, 5604 Stopes
SL-01	SCISSOR LIFT (LIFTMASTER)	DIESEL	scissor lift	Ramp
SL-03	SCISSOR LIFT (LIFTMASTER)	DIESEL	scissor lift	ramp

Table 15-4: Major mobile equipment.

15.8.1 Production Rate and Life of Mine Plan

The production rate at Macassa is 985 tpd each of ore and waste. The Life of Mine plan (LOM) for the Macassa Mine is shown in **Table 15-5**.

Macassa	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Tonnes	355,032	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	353,802	317,515	272,156	212,398	5,756,528
Grade (g/t)	16.99	17.95	19.91	20.58	20.58	20.11	19.85	19.85	19.85	19.85	17.82	17.43	17.55	16.79	15.13	12.27	12.20	18.16
Ounces Mined	193,929	204,205	226,432	234,052	234,052	228,799	225,767	225,767	225,767	225,767	202,663	198,211	199,601	191,034	154,416	107,355	83,282	3,361,101
Mill Recovery	97.3%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.3%	97.0%	97.0%	97.4%
Ounces Poured	188,639	198,896	220,545	227,967	227,967	222,851	219,897	219,897	219,897	219,897	197,394	193,058	194,411	186,067	150,224	104,162	80,799	3,272,567
Operating days per year	365	365	365	366	365	365	365	366	365	365	365	366	365	365	365	366	366	6,210
Average Daily Mining Rate (tpd)	973	969	969	967	969	969	969	967	969	969	969	967	969	969	870	744	580	927

Table 15-5: LOM Plan.

16.0 RECOVERY METHODS

16.1 Process Plant Flow Sheet

The ore is crushed down to 11 mm at a maximum throughput rate of 180 tph and then ground to 40-45 microns; cyanide is added at the grinding stage. It is then delivered to two pre-oxidation tanks before being pumped to the thickener. The overflow reports to the carbon columns (where over 75% of the gold is recovered) and the underflow to the leach circuit. Leaching takes place in seven tanks during a retention time of 100 hours. The carbon-in-pulp circuit (CIP) consists of six tanks. Following electro-winning, the concentrate is melted in an induction furnace to produce doré grading 85% to 88% gold and 8% to 10% silver. The capacity of the plant is 2,000 tpd. A schematic of the flow chart is presented in

Figure 16-1 and details of the crushing and grinding circuit are displayed in Table 16-1.

The company's mill was built in 1986 at a capacity of 725 tpd. Modifications over the years increased the throughput capacity to 2,000 tpd in 2013.

In the QP's opinion, there are no processing factors or deleterious elements that could have a significant effect on potential economic extraction at the Macassa Mine.

Jaw crusher: Birdsboro 36 x28 (112 kW)
Standard Cone crusher: Symons 4.25' (112 kW)
Tertiary cone crusher: Metso HP4 (298 kW)
Primary Ball Mill: 15 x 20 (2,237 kW)
Secondary Ball Mill: 10.5 x 16 (1,193 kW)
#1 tertiary ball mill: 10.5 x 13 (597 kW)
#2 tertiary ball mill: 10.5 x 13(597 kW)

Table 16-1: Details of the grinding circuit.

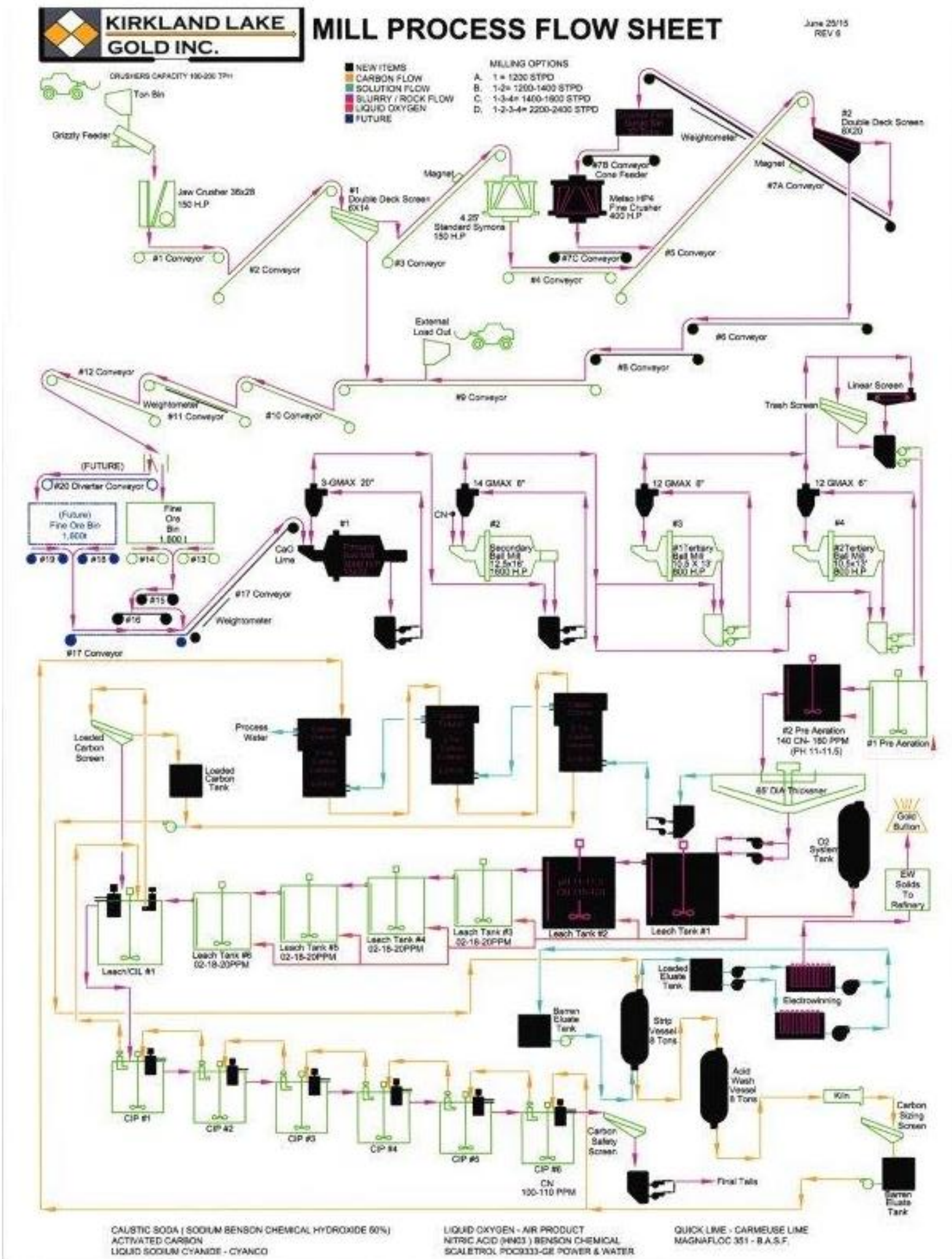

Figure 16-1: Process flow sheet.

17.0 PROJECT INFRASTRUCTURE

17.1 Surface Buildings

Macassa has two shafts from surface (a third shaft, #1 Shaft, has been decommissioned), a mill and refinery and a full complement of office and other buildings.

The office and other buildings recently have been expanded to handle the increased work force needed for the increasing production.

The surface general layout is shown Figure 17-1.

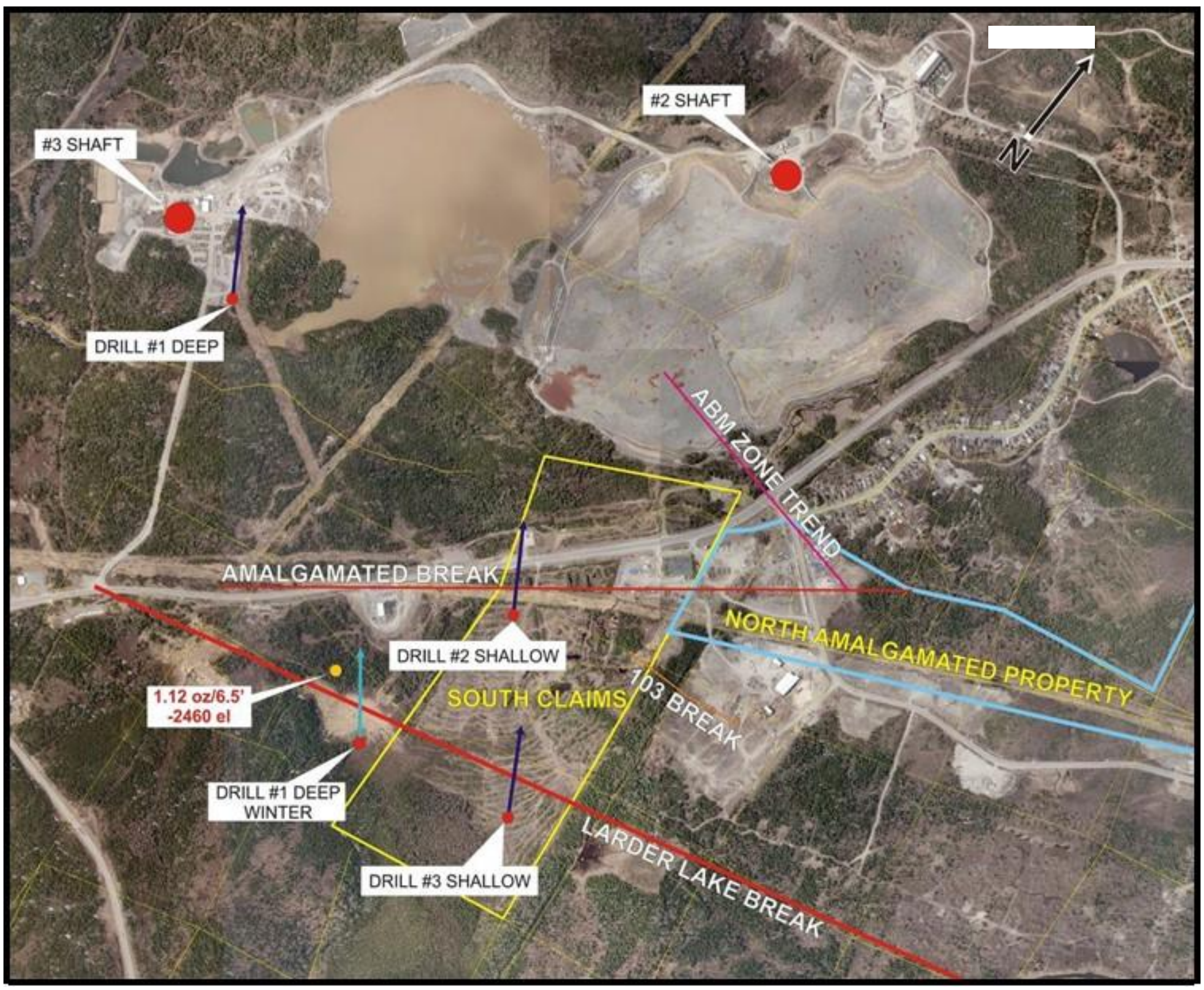

Figure 17-1: Macassa property surface general arrangement.

17.2 Ore Transportation

The ore is transported approximately 1.3 km from #3 Shaft to the Mill in triaxle dump trucks at a rate of 18 t per load.

17.3 Power

Power to site is supplied by HydroOne via the K4 115kV and G3K 44 kV transmission lines. The power is stepped down on site to 4,160 V for distribution via three 10 MVA transformers (one located at the mill complex and two located at the #3 shaft mine complex).

Power is distributed underground via three 500 MCM 4,160V feeders going down #3 shaft and one 4,160V feeder going down #2 Shaft. In the event of power loss, a 2 MVA generator onsite provides power to operate the #3 shaft service hoist and provide limited compressed air underground.

A 15 kV underground feeder is being installed in #3 shaft to provide an additional 5 MVA of capacity underground in support of anticipated mine growth in the SMC. It is expected to be operational before the end of the year.

Distribution of the power underground is provided by 4,160V feeders which power underground substations located throughout the mine that step the power down to 600V to power loads such as fans, pumps, loaders, etc.

17.4 Underground Mine Dewatering and Fresh Water Requirements

<u>Fresh Water</u>

Water from the abandoned eastern workings of the historic mines are controlled via a bulkhead located on the 4250 Level. The water is pumped from the bulkhead to a pumping station at 4250 Level at the #3 Shaft station. Water for the underground operational needs is supplied by a series of water boxes which control the water pressure and distribute the water underground from pump stations at 4250 Level #3 Shaft and 3000 Level #3 Shaft.

<u>Dewatering</u>

Dewatering the mine is accomplished by a series of pumping lift stations located at: 1275, 3000, and 4250 levels. Each pump station consists of two multistage Carver pumps capable of pumping a combined maximum of 1200 gpm. The water reports to the 4250 Pumping Station from the bulkhead at the east of 4250 Level and the #3 Shaft bottom pump which is pumped up the shaft from a lift station at 5725 Level.

Total mine discharge averages between 2,000 m^3/day and 8,000 m^3/day depending on the time of year

17.5 Underground Mine Ventilation

Primary ventilation at Macassa is illustrated in Figure 17-2.

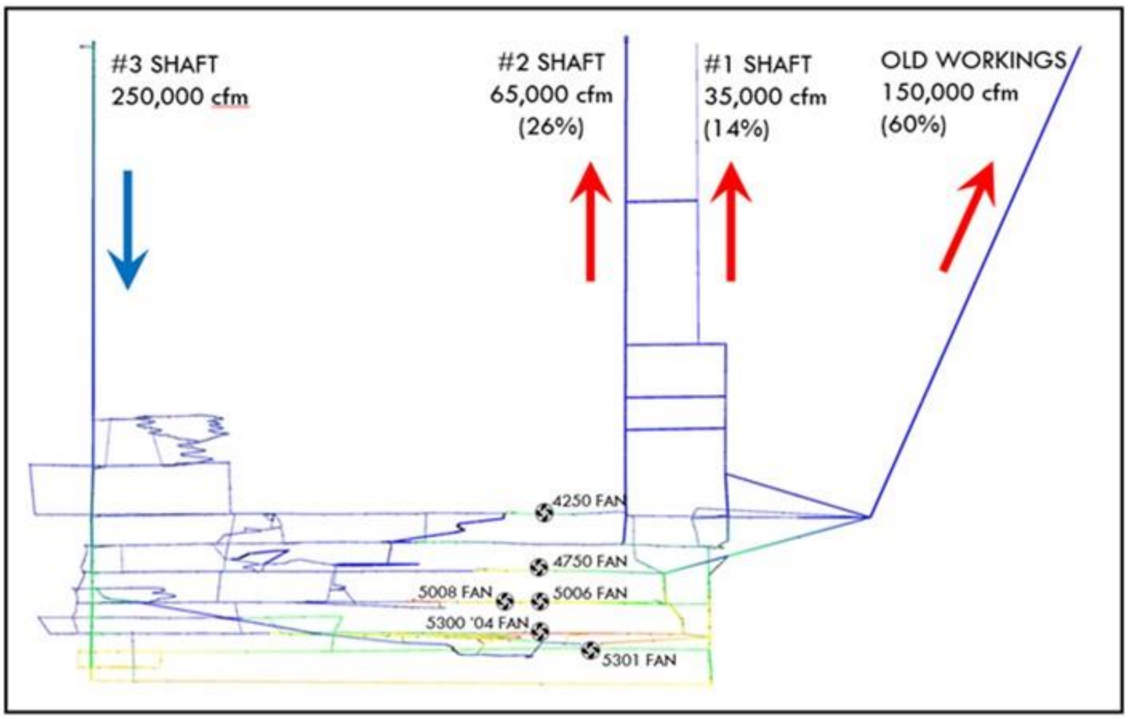

Figure 17-2: Primary ventilation system.

The Macassa mine site uses a push pull system to ventilate the underground workings. There are five vent-boosting sites on four different levels in the mine. These fans pull a total of 119 m^3/s. The five fans pull air down #3 Shaft, across the levels and ramps and pushes the air into old Macassa, Kirkland Lake Minerals, Teck Hughes and Lakeshore workings. The air exhausts to surface through Macassa #2 Shaft, Macassa #1 Shaft, and old mine workings representing 26%, 14% and 60% of the total air volume respectively.

During the winter months the air is heated with two 14MM BTU propane heaters located at the entrance of #3 Shaft Ramp Portal located on the West side of the shaft. There are two 2.1 m 259 kW fans on VFDs which can push up to 149 m^3/s depending on the requirement for the headframe, into the portal. The ramp meets the shaft at the 125 level. These two fans only provide heated air to the shaft and the excess air provides heat and positive pressure to the #3 headframe.

17.6 Underground Material Handling

The ore and waste material generated in the Main Break zone is drawn from chutes or loaded directly by LHD's into cars and trammed on the main levels to the ore and waste passes located at the #3 Shaft. The ore and waste material generated in the SMC zone below 5300 Level is drawn from chutes or loaded directly by LHD's into haul trucks and trammed up the main ramp to the ore and waste passes located at the top of the 5056 Ramp at #3 Shaft

17.7 Communications

There is an 11-channel leaky feeder communication system for underground services throughout the mine and two licensed frequencies on surface for a total of 13 channels.

One channel also services the #3 Shaft conveyances for slack rope control.

The dial phone system consists of four call gateways underground, 56 VoIP phones, and 31 analog phones.

Each refuge station and battery charge bay is equipped with a computer that can be used for communications such as Skype and e-mail.

Each Shaft station and refuge station are equipped with sound power phones for communication to the shifters' wicket, deck house and Hoistroom

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18.0 MARKET STUDIES AND CONTRACTS

18.1 Market for the Product

The QP has reviewed KLG contracts with refiners or brokers and he is satisfied that the contracts reflect industry norms and reasonable market terms for selling Macassa's gold production.

18.2 Material Contracts

The material contracts at Macassa are:

- Surface exploration drilling (Major Drilling)
- Underground exploration drilling (BOART Longyear)
- Explosive supplier (Dyno Nobel)
- Raise miners (Redpath)

19.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

A number of environmental related studies have been completed at the Macassa Complex in order to support the filing of the Closure Plan Amendment in 2013, which are continuously referenced for baseline information and ongoing programs. These studies include, but are not limited to the following (Klohn Crippen Berger, 2013):

- Geochemistry Program;
- Closure “Lake” Ecology Study and Report;
- Surface and hydrogeology characterization, including site, local and regional drainage patterns;
- Surface and groundwater quality; and,
- Terrestrial Plant and Animal life characterization.

Ongoing environmental studies at the operations level include the Environmental Effects Monitoring program, Progressive Rehabilitation program (will be discussed in greater detail below), noise mitigation program and other regulatory-driven projects as required.

In addition, the Macassa Complex is in the early stages of designing, permitting and constructing a new tailings storage facility (TSF). The preferred location identified for the new TSF is located to the north of the Macassa TSF (Figure 19-1). The permitting strategy and work plan associated with this program is progressing in tandem with the eventual decommissioning of the current Macassa TSF, as it will be reaching its maximum operating configuration in the upcoming years. One of the critical paths for the new TSF will be the environmental permitting aspect; KLG anticipates receiving the necessary permits required to build the new TSF.

The Macassa TSF is the only active tailings storage facility at the Macassa Complex, and has been in use for approximately the past 70 years. As such, the facility is approaching the end of its useful life, and will be decommissioned as per the closure concept outlined in the CPA. Currently, the slurry material is deposited into the facility, which is approximately 53 ha and consists of an Upper and Lower Basin. As part of the water management strategy at the Macassa Complex, the solids settle into the TSF, and the supernatant decants into a Conditioning Pond, where it held. On a seasonal basis, effluent from the Conditioning Pond is treated in through a treatment facility and then discharged into a series of four settling ponds. Finally, the effluent is released through the Final Discharge location into the receiving water body, Amikougami Creek.

Figure 19-1: Current and proposed location of the new TSF (yellow circle).

In addition, the effluent water from the Conditioning Pond is reclaimed and pumped back to the Mill to be used for process, which conserves and reduces potable water usage.

There are various monitoring and inspection programs that occur both on and off-site to support and improve the tailings and water management strategies. Compliance monitoring includes surface and ground water characterization monitoring, air quality monitoring (metals and fugitive dust), storm water drainage monitoring, freeboard inspections, as well as visual inspections of the TSF done by multiple departments. A 3rd party Dam Safety Inspection (DSI) is completed annually at the Macassa TSF, as well as a Dam Safety Review (DSR).

Post mine-closure, the Macassa TSF will be in its final closure configuration as per the filed Closure Plan Amendment. The facility will be in active closure, therefore inspections and monitoring will still be ongoing. Water quality monitoring and treatment is expected to occur for the first two to three years post-closure while steady state conditions are being reached. Re-sloping and breaching of some dams will be required, at which point re-vegetation will occur.

Currently, the Macassa Complex has all of its required permits and applications for operations, with the exception of having a LRIA work permit for construction or modifications to tailings dam structures. This issue has been addressed with the appropriate regulators, and the application for said permit has been submitted for approval.

As previously discussed, a new tailings storage facility is planned for the Macassa Complex. As such, a permitting strategy and work plan is developed to acquire the appropriate permits and approvals to move the project forward.

Additional permit submissions and applications are mostly dependent on changes and/or projects occurring at the site level, therefore these are initiated as required.

At this stage, there are no known requirements to post performance or reclamation bonds for the Macassa Complex.

The list of relevant environmental permits is shown in Table 19-1.

Type	Subtype	Number	Issue Date	Exp
ECA	Air	9758-A5BPZV	7/8/2016	
ECA	Industrial Sewage	3443-9XYJLS	11/13/2015	
ECA	Municipal and Private WorkS	5671-A8RLCS	7/7/2016	
PTTW	#3 Shaft dewatering	6674-8UZQUC	6/7/2012	6/7/2022
PTTW	Lakeshore Pond dewatering	3085-842GTX	3/31/2010	11/2/2019
LRIA - in progress				

Table 19-1: List of permits.

KLG has recently signed an agreement with First Nations who have treaty and aboriginal rights which they assert within the operations area of the mine.

The agreement provides a framework for strengthened collaboration in the development and operations of the mine and outlines tangible benefits for the First Nations, including skills training and employment, opportunities for business development and contracting, and a framework for issues resolution, regulatory permitting and KLG's future financial contributions

The Closure Plan for the Macassa Complex and its three contiguous historical properties (Kirkland Minerals, Teck Hughes and Lakeshore) was filed with the Ministry of Northern Development and Mines in 2014. Since then, there have been two addenda filed. The CPA will be amended every five years maximum, to reflect any site changes as well as associated changes to the Financial Assurance estimates. It is important to note that one additional historical property, Wright-Hargreaves, is not included within the Closure Plan boundary. As such, this property and its legacy concerns (shafts, adits, stopes, etc.) are remediated annually as part of the Progressive Rehabilitation requirements listed in O.Reg 240/00. Because of this, there is no Financial Assurance posted to remediate any hazards within the Wright Hargreaves property.

KLG completes rehabilitation measures of legacy mine hazards annually both within the Closure Plan boundary and on the Wright-Hargreaves property. Each mine hazard has been included in a register, which has formed the basis of the schedule for remediation. Also, a request for credit will be sent to the MNDM at the same 5-year frequency described above to accurate reflect any credit required to be reflected on the Financial Assurance package as mine hazards are rehabilitated.

The Financial Assurance held with the MNDM is in the form of surety bonds, and is currently of a value of $7,052,375.

20.0 CAPITAL AND OPERATING COSTS

20.1 Capital Costs

20.1.1 Basis of Estimate

Capital costs estimate for major items is based on historical costs at the Macassa mine, costs included in the 2017 Budget or budgetary quotations from suppliers in the industry.

20.1.2 Cost Estimate

Capital expenditures budgeted for the Macassa Mine are $77.2 M in 2017. $39.1 M will be incurred developing the Main Break and SMC zones (vertical and lateral). In addition to the deferred development, a further $38.1 M will be spent on purchasing fixed and mobile equipment and infrastructure, mainly in the SMC zone.

Details on capital expenditures are provided in in Table 20-1.

	Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Macassa												
Mine Opex	$2,337,097,076	$123,132,486	$125,539,714	$127,613,892	$130,241,218	$133,110,442	$135,999,364	$138,698,905	$141,410,883	$144,135,631	$146,873,490	$146,798,599
Mill Opex	$242,100,600	$14,580,285	$14,571,197	$14,613,429	$14,656,505	$14,700,442	$14,745,259	$14,790,971	$14,837,598	$14,885,157	$14,933,668	$14,983,149
Royalties	$120,832,624	$4,508,014	$7,239,244	$8,225,171	$8,586,791	$8,586,791	$8,604,508	$8,583,190	$8,583,190	$8,583,190	$8,583,190	$7,644,258
Sustaining Capital	$975,356,410	$88,311,851	$73,841,294	$74,006,294	$69,156,294	$69,006,294	$66,506,294	$66,506,294	$67,506,294	$66,506,294	$66,506,294	$81,356,063
Growth Capital	$2,200,000	$1,100,000	$1,100,000	$0	$0	$0	$0	$0	$0	$0	$0	$0

Table 20-1: LOM capital expenditures breakdown for the Holt Mine.

20.2 Operating Costs

20.2.1 Basis for Estimate

Operating costs for units of work that will be carried out by Macassa personnel were based on first principles calculations included in the 2017 Macassa budget.

20.2.2 Cost Estimate

Operating unit costs for the Macassa Mine average $368/t, based on the 2017 Budget, or $381/t when including royalties. Details are provided in Table 20-2.

Mine Cost Details	2017 Budget
Surface G&A	$14,782
Power	7,314
Propane	529
Diesel	662
Surface Operations	3,761
Operating Development (Direct)	8,672
Stoping	20,945
Backfill & Pastefill	7,154
UG Supervision	5,846
Electrical (labour and materials)	6,476
Haulage (include UG service man)	14,557
U/G Services	14,463
Production Geology and Definitely Drilling	7,107
Equipment Operations	**25,099**
Regional shared services allocated	3,448
Macassa Mine costs before allocations to capital	**$140,816**
Indirects allocated to capital	(24,621)
MINE OPERATING COSTS	**116,195**

Table 20-2: Mine operating costs breakdown.

21.0 ECONOMIC ANALYSIS

KLG is a producing issuer and, following instructions contained in Form 43-101F1 Technical Report, may exclude information required under Item 22 (Economic Analysis) for Technical Reports on properties currently in production unless the Technical Report includes a material expansion of current production.

22.0 ADJACENT PROPERTIES

There are no adjacent properties that influence the mineral resources and mineral reserves at Macassa.

There are no adjacent properties that Macassa relies upon for the operation of the mine and mill complex.

23.0 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information on the Macassa property known to the QPs that, if undisclosed, would make this NI 43-101 Technical Report misleading or more understandable.

24.0 INTERPRETATION AND CONCLUSIONS

24.1 General

This Technical Report was compiled by KLG employees.

Production activities at the Macassa Mine started in 1933. After a brief shut down due to low gold prices in the early 200's, the mine re-opened and continue to produce gold from high grade ore.

The recent business transaction between Kirkland Lake Gold Inc. and Newmarket Inc. provided additional opportunities to further develop the Property supported by an increased in capital expenditures. In current gold price environment, the operation is expected to generate significant free cash flows that will benefit KLG's shareholders.

24.2 Opportunities

Opportunities at the Macassa Mine are as follows:

- SMC mineralization remains open to the east, west and at depth. Diamond drilling continues to return high grade mineralization. That said, the 5300 level exploration drift east with associated drill bays must be considered a high priority development heading at the mine.
- In 2017, the operation will transition from modified polygonal mineral resource estimates to block modelling. This will optimize grade interpolation, determination of high grade capping levels, and aid with mine / mill reconciliation process.
- Improvements in the material handling process could result in favourable impact on the mine operating costs.
- Upgrade of the ventilation system will have a favourable impact on the work environment temperature.

24.3 Risks

Risks that could be present at the operation are summarized as follows:

- Future exploration programs are unable to keep pace with mining that in turn results in mineral resources and mineral reserves being depleted;

- Increased costs for skilled labour, power, fuel, reagents, trucking, etc. could lead to an increase the cut-off grade and decrease the level of mineral resources and mineral reserves;

- Mechanical breakdown of critical equipment (hoist, conveyance, mill, etc.) or infrastructure that could decrease or halt the production throughput at the mine;

- Production throughput relies on completing development activities as per the mining plan schedule. If lower development productivity than budgeted are encountered, this will likely affect the production profile of the current mining plan.

25.0 RECOMMENDATIONS

A number of recommendations arising from the Technical Report are found below:

- 2017 will be a transformational year at Macassa as the company changes the mineral resource calculation method from modified polygonal to block modelling. This change is anticipated to result in more efficient resource updates, facilitate grade reconciliation studies and will provide benefits to the LOM planning.
- Exploration Drilling will continue to test for the easterly strike extension of the South Mine Complex ("SMC") mineralization to the east employing a combination of deep scout level drilling from surface, with follow-up underground drill testing from the 5300 level east
- Complete technical studies to increase the airflow and reduce the work environment temperature and humidity. Some study work can be completed internally; Otherwise, approximately $50,000 was budget to complete technical work.
- Technical work should be undertaken to assess infrastructure requirements for the continuous mining of the Macassa deposit.

26.0 REFERENCES

Analytical Solutions Ltd. 2015, A Review of the Macassa Mine Laboratory Operations. Prepared for KL Gold, dated December 19, 2015.

Ayer, J.A., Amelin, Y., Kamo, S.L., Ketchum, J.W.F., Kwok, K. and Trowell, N. 2002: Evolution of the southern Abitibi greenstone belt based on U-Pb chronology: autochthonous volcanic construction followed by plutonism, regional deformation and sedimentation; Precambrian Research, v. 115, pp. 63-95.

Clark, G.R., 2015: NI 43-101 Technical Report "Review of Resources and Reserves of Macassa Mine Kirkland Lake, Ontario" dated January 1, 2015.

Panterra Geoservices Inc. 2005, Structural Study of the Kirkland Lake Gold System, Ontario, with Exploration Implications. Internal report prepared for KL Gold, dated October 31, 2005.

Panterra Geoservices Inc. 2017, Comments regarding drill hole observations of deep and lateral structural targets, Macassa Mine and region. Internal report prepared for KL Gold, dated January 15, 2017.

27.0 SIGNATURE PAGE AND DATE

The undersigned prepared this Technical Report titled "Macassa Property, Ontario, Canada, Updated NI 43-101 Technical Report". The effective date of this Technical Report is December 31, 2016 and the disclosure date is March 30, 2017.

Signed,

"signed and sealed"

Pierre Rocque, P. Eng.	March 30, 2017	Kirkland Lake Gold Royal Bank Plaza, South Tower 200 Bay Street, Suite 3120 Toronto, Ontario, M5J 2J1 Canada

"signed and sealed"

Doug Cater, P. Geo.	March 30, 2017	Kirkland Lake Gold Royal Bank Plaza, South Tower 200 Bay Street, Suite 3120 Toronto, Ontario, M5J 2J1 Canada

CERTIFICATE OF QUALIFIED PERSON

I, Pierre Rocque, P. Eng., as an author of this report entitled “Macassa Property, Ontario, Canada, Updated NI 43-101 Technical Report” dated effective December 31, 2016 prepared for Kirkland Lake Gold Ltd. (the “Issuer”) do hereby certify that:

1. I am Vice President of Technical Services, at Kirkland Lake Gold Ltd., located at Royal Bank Plaza South Tower, 200 Bay Street, Suite 3120, Toronto, ON, Canada M5J 2J1.
2. This certificate applies to the Technical Report entitled “Macassa Property, Ontario, Canada, Updated NI 43-101 Technical Report”, dated effective December 31, 2016 (The “Technical Report”)
3. I graduated with a Bachelor’s degree in Mining Engineering (B. Ing.) in 1986 from École Polytechnique de Montréal and a Master’s degree in Mining Engineering (M.Sc.Eng.) in 1992 from Queen’s University at Kingston. I have worked as a mining engineer since graduation from university in 1986. I have been directly involved in mine design of underground gold mines and, since 1997 I have overseen the mining engineering department at three narrow veins underground gold mines, providing relief to the Mine Manager and General Manager on site. Since 2008, I have provided corporate direction for the engineering function at junior gold exploration and producing companies, except from 2014 to 2016 where I was Global Director-Mining for an international EPCM firm. I am a member of Professional Engineers of Ontario and Ordre des Ingénieurs du Québec.
4. I am familiar with National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* (“NI 43-101”) and by reason of education, experience and professional registration I fulfill the requirements of a “qualified person” as defined in NI 43-101.
5. I last visited the Macassa Property, subject of the Technical Report, on March 2017.
6. I am responsible for the preparation of the Summary and Sections 1 to 5, 12, 14 to 27 of the Technical Report.
7. I am not independent of the Issuer as described in section 1.5 of NI 43-101, as I am an employee of the Issuer. Independence is not required under Section 5.3 (3) of NI 43–101.
8. I have prior involvement with the property that is the subject of the Technical Report as I was working at the Property between 1994 and 1997.
9. I have read NI 43–101 and the parts of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.
10. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 30th day of March, 2017.

“Signed and Sealed”

Pierre Rocque, P. Eng.
Vice President Technical Services

CERTIFICATE OF QUALIFIED PERSON

I, **Douglas Cater**, **P. Geo**, as an author of this report entitled "Macassa Property, Ontario Canada, Updated NI 43-101" dated effective December 31, 2016 prepared for Kirkland Lake Gold Ltd. (the "**Issuer**") do hereby certify that:

I am Vice President Exploration Canada, at Kirkland Lake Gold Ltd. located at Royal Bank Plaza, South Tower 200 Bay Street, Suite 3120 Toronto, Ontario, M5J 2J1 Canada.

This certificate applies to the technical report entitled "Macassa Property Updated NI-43-101", dated effective December 31, 2017 (the "**Technical Report**").

I graduated with a Bachelor of Science degree in Earth Science from University of Waterloo, Waterloo, ON, in 1981. I have been an Exploration Manager / Chief Geologist at several gold mines and advanced stage exploration projects since 1991 and have been responsible for all geological functions including calculating and reporting of Mineral Resources. I am a member in full standing of the Association of Professional Geoscientists of Ontario with Registration No. 0161. I have practiced my profession for over thirty years. Since January 2016, I have been Vice President Exploration responsible for surface exploration activities on the company's extensive land package.

I am familiar with National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("**NI 43-101**") and by reason of education, experience and professional registration I fulfill the requirements of a "qualified person" as defined in NI 43-101.

I last visited the Macassa Mine, subject of the Technical Report, on March 17, 2017.

I am responsible for the Summary and Sections 6 to 11, 13 and 22 to 25 of the Technical Report.

I am **not** independent of the Issuer as described in section 1.5 of NI 43-101**, as I am an employee of the Issuer**.

I have prior involvement with the property that is the subject of the Technical Report. I have been frequently involved with the property having worked at the mine from 1981 to 1997 inclusive with increasingly greater responsibility for the Geology group at the mine.

I have read NI 43-101 and the parts of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

At the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 30th day of March, 2017**.**

"Signed and Sealed"

Douglas Cater, P. Geo
Vice President Exploration

Appendix A: Macassa claim list.

Project	Claim Type	Claim Number	Area (Ha)	Comments
Lebel Twp. Property	Patent	L-2257	16.92	MR & SR
Lebel Twp. Property	Patent	L-2430	19.87	MR & SR
Lebel Twp. Property	Patent	L-2447	16.19	MR & SR
Lebel Twp. Property	Patent	L-2448	18.88	MR & SR
Lebel Twp. Property	Patent	L-2450	17.28	MR & SR
Lebel Twp. Property	Patent	L-2452	14.77	MR & Part SR
Lebel Twp. Property	Patent	L-2459	17	MR & SR
Lebel Twp. Property	Patent	L-2469	14.08	MR & SR
Lebel Twp. Property	Patent	L-2676	3.44	MR & part SR
Lebel Twp. Property	Patent	L-2677	11.86	MR & part SR
Lebel Twp. Property	Patent	L-2790	12.38	MR & part SR(SRO pending Severance & transfer to McCombe)
Lebel Twp. Property	Patent	L-2791	4.53	MR & part SR(SRO pending Severance & transfer to McCombe)
Lebel Twp. Property	Patent	L-2807	13.96	MR & Part SR(SRO pending Severance & transfer to McCombe)
Lebel Twp. Property	Patent	L-2808	13.15	MR & SR
Lebel Twp. Property	Patent	L-2886	8.98	MR & SR
Lebel Twp. Property	Patent	L-2900	9.23	MR & SR
Lebel Twp. Property	Patent	L-2901	9.19	MR & SR
Lebel Twp. Property	Patent	L-2988	11.81	MR & SR
Lebel Twp. Property	Patent	L-3009	29.95	MR & SR
Lebel Twp. Property	Patent	L-3010	20.15	MR & SR
Lebel Twp. Property	Patent	L-3011	21.45	MR & SR
Lebel Twp. Property	Patent	L-5940	19.51	MR & Part SR
Lebel Twp. Property	Patent	L-7798	14.69	MR & SR
Lebel Twp. Property	Patent	L-7799	16.75	MR & SR
Lebel Twp. Property	Patent	L-8819	19.14	MR & SR
Lebel Twp. Property	Patent	L-8820	15.01	MR & SR
Lebel Twp. Property	Patent	L-8821	18.86	MR & SR
Lebel Twp. Property	Patent	L-8822	22.14	MR & SR

Lebel Twp. Property	Patent	L-8823	15.7	MR & SR
Lebel Twp. Property	Patent	L-8824	13.88	MR & SR
Lebel Twp. Property	Patent	L-16514	16.55	MR & SR
Lebel Twp. Property	Patent	L-16515	10.93	MR & SR
Lebel Twp. Property	Patent	L-20176	2.9	MR & SR
Lebel Twp. Property	Staked Claim	L-893443	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014631	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014632	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014633	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014634	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014644	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1014645	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1221678	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1221680	64	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1221778	16	MR - STAKED
Lebel Twp. Property	Staked Claim	L-1221779	16	MR - STAKED
			715.13	
TECK TOWNSHIP				
Wright Hargreaves	Patent	T.C. 708	16.43	MRO
		T.C. 708		SR
		T.C. 708		SR
Wright Hargreaves	Patent	T.C. 709	10.12	MRO
		T.C. 709		PT. SRO (L-1829)
Wright Hargreaves	Patent	T.C. 710	15.39	MRO. Part SR
		T.C. 710		PT SR
Wright Hargreaves	Patent	T.C. 711	19.95	MRO (RECORDED AS L-1831)
		T.C. 711		PT. SRO
			61.89	

Teck Hughes	Patent	L-1824	5.46	MR
		1824		SRO
Teck Hughes	Patent	L-1825	9.55	MR
		1825		PT SR
Teck Hughes	Patent	L-2242	1.9	PT. SRO
	Patent	L-2242		SRO
	Patent	L-2242		PT SR
		L-2242		PT SR
		L-2242		PT SR
Teck Hughes	Patent	L-16625	10.97	MR
		16625		PT SR
Teck Hughes	Patent	L-16626	10.6	MR
		16626		PT SR
		16626		PT SR
Teck Hughes	Patent	L-16624	12.91	MR
		16624		SRO
			51.39	
Kirkland Minerals	Patent	L-2643	17	MR
Kirkland Minerals	Patent	L-1236	14.41	MR
		1236		PT SR
Kirkland Minerals	Patent	L-1238	14.97	MR
		1238		PT SR
Kirkland Minerals	Patent	L-1239	15.9	MR
		1239		SR
Kirkland Minerals	Patent	L-1240	15.46	MR
		1240		PT SR
Kirkland Minerals	Patent	L-1643	11.24	MRO
Kirkland Minerals	Patent	L-1850	13.01	MR/SR?
		1850		SR
			101.99	

Lake Shore Property	Patent	1223		PT. SRO
Lake Shore Property	Patent	1340		PT. SRO
Lake Shore Property	Patent	1342		PT. SRO
Lake Shore Property	Patent	1343		PT. SRO
Lake Shore Property	Patent	1432		SRO
Lake Shore Property	Patent	L-1557	13.09	MRO
Lake Shore Property	Patent	L-1557		PT SR
Lake Shore Property	Patent	L-1557		PT SR
Lake Shore Property	Patent	L-1557		PT SR
Lake Shore Property	Patent	1748		SRO
Lake Shore Property	Patent	1754		PT. SRO, Guarantee Trust
Lake Shore Property	Patent	L-2243	4.99	MR & PT. SR
Lake Shore Property	Patent	L-2605	3.34	MR & PT. SR
Lake Shore Property	Patent	L-2606	14.47	MRO
		L-2606		PT. SRO
		L-2606		PT. SRO
		L-2606		PT SR
		L-2606		PT SR
Lake Shore Property	Patent	L-2645	17.85	MR & PT. SR
		L-2645		PT SR
		L-2645		PT SR
Lake Shore Property	Patent	2967		SRO
Lake Shore Property	Patent	3018		SRO
Lake Shore Property	Patent	3019		SRO
Lake Shore Property	Patent	3034		SRO
Lake Shore Property	Patent	L-3601	1.82	MRO
		L-3601		PT SR
		L-3601		PT SR
Lake Shore Property	Patent	6013		SRO
Lake Shore Property	Patent	6804		SRO
Lake Shore Property	Patent	6805		SRO

Lake Shore Property	Patent	7811		SRO
Lake Shore Property	Patent	8128		SRO, PT. OF
Lake Shore Property	Patent	8880		SRO
Lake Shore Property	Patent	9107		SRO
Lake Shore Property	Patent	9467		PT. SRO
Lake Shore Property	Patent	9468		PT. SRO
Lake Shore Property	Patent	9821		SRO
Lake Shore Property	Patent	9822		SRO
Lake Shore Property	Patent	11384		SRO
Lake Shore Property	Patent	L-16633	15.39	MRO
Lake Shore Property	Patent	L-16634	10.32	MRO
Lake Shore Property	Patent	L-16635	11.47	MRO
		16635		PT SR
		16635		PR SR
Lake Shore Property	Patent	L-16726	6.27	MR & SR
			99.01	
Newfield transfer	Patent	L-2604	13.88	MRO
Newfield transfer	Patent	L-2644	9.35	MR
Newfield transfer	Patent	L-2755	15.99	MR
Newfield transfer	Patent	L-2771	6.48	MR
Newfield transfer	Patent	L-2788	1.38	MR
Newfield transfer	Patent	L-2823	11.53	
	Patent	L-7408	0	License of Occupation # 897, mining rights covered by L-2823
Newfield transfer	Patent	L-2848	16.19	MR
			74.8	
Spark Gold	Crown Lease	342832 et Al	100.5	MR, L342832,L342833,L342834,L342855, L342856, L342857
Macassa Mine Property	Patent	H.R. 546	18.86	MR, SR 1/4 INT MR& SR to Township of Teck

Macassa Mine Property	Patent	HR 547	9.35	MR, SR 1/4 INT MR& SR to Township of Teck
Macassa Mine Property	Patent	HR 548	7.2	MR, SR 1/4 INT MR& SR to Township of Teck
Macassa Mine Property	Patent	HR 732	17.93	MRO (RECORDED AS L-3907, SR Town of Kirkland Lake)
Macassa Mine Property	Patent	HS 1166	12.42	MR & SR (6219) - Registered to Barrick Gold
Macassa Mine Property	Patent	HS 1171	11.09	MRO
Macassa, St. Joseph	Patent	L-1224	10.62	PT. SRO, Claim To Be Transferred From Barrick
		1224		PT SR
Macassa, St. Joseph	Patent	L-1225	14.75	MR+SRO
Macassa St. Joseph	Patent	HR1426	13.4	PT. SRO-MR, Claim To Be Transferred From Barrick
		HR1426		PT SR
Macassa Mine Property	Patent	L-1525	7.45	MR SR
Macassa Mine Property	Patent	L-1616	16.14	MR & SR
Macassa Mine Property	Patent	L-1617	18.19	MR & PT. SR
Macassa Mine Property	Patent	L-2634	17.28	MR, PRT SR
Macassa Mine Property	Patent	L-2635	13.4	MRO, SR Betty Blaauw, S1/2) Chad and Linda Wallace(N 1/2)
Macassa Mine Property	Patent	L-2636	17.36	MR , SR Town of Kirkland Lake
Macassa Mine Property	Patent	L-2637	13.66	MR , SR Town of Kirkland Lake
Macassa Mine Property	Patent	L-2638	9.83	MR , SR Town of Kirkland Lake
Macassa Mine Property	Patent	L-2639	12.99	MR
Macassa Mine Property	Patent	L-2640	9.31	MR & PT. SR
Macassa Mine Property	Patent	L-2641	13.05	MRO, Claim Transferred From Barrick in 2007
Macassa Mine Property	Patent	L-2642	15.9	MR & SR
Macassa Mine Property	Patent	L-2762	19.63	MR
Macassa Mine Property	Patent	L-2763	19.22	MR
Macassa Mine Property	Patent	L-2764	20.36	MR
Macassa Mine Property	Patent	L-2830	21.49	MR & PT. SR
Macassa Mine Property	Patent	L-2831	21.25	MR & PT. SR, 450/500 INT to Township of Teck
Macassa Mine Property	Patent	L-2837	16.39	MR & SR
Macassa Mine Property	Patent	L-2838	18.49	MR & SR

Macassa Mine Property	Patent	L-2947	16.92	MRO
Macassa Mine Property	Patent	L-2948	14.08	MRO
Macassa Mine Property	Patent	L-3044	3.56	MR & PT. SR
Macassa Mine Property	Patent	L-3468	15.05	MRO
Macassa Mine Property	Patent	L-4185	9.11	MR & SR
Macassa Mine Property	Patent	L-4186	9.83	MR & SR
Macassa Mine Property	Patent	L-4755	8.85	MRO - F.J. Davis, J.F. Davis, Estate of Edwin Davis
Macassa Mine Property	Patent	L-5045	11.61	MR
Macassa Mine Property	Patent	L-5049	15.14	MR
Macassa Mine Property	Patent	L-5362	16.1	MR
Macassa Mine Property	Patent	5362		SR
Macassa Mine Property	Patent	L-5688	15.34	MRO
Macassa Mine Property	Patent	L-5689	8.92	PT MR
Macassa Mine Property	Patent	L-5692	18.62	MRO
Macassa Mine Property	Patent	5692		SRO
Macassa Mine Property	Patent	L-5693	19.43	MRO
Macassa Mine Property	Patent	5693		MRO
Macassa Mine Property	Patent	L-5926	18.05	MRO
Macassa Mine Property	Patent	L-5927	15.99	MRO
Macassa Mine Property	Patent	L-5928	16.96	MRO
Macassa Mine Property	Patent	L-5929	20.96	MRO
Macassa Mine Property	Patent	L-5967	13.96	MR SR 2/3 INT to Township of Teck
Macassa Mine Property	Patent	L-5980	22.3	MR SR 2/3 INT to Township of Teck
Macassa, St. Joseph	Patent	L-6432	6.35	MR& SRO, Claim To Be Transferred From Barrick
Macassa Mine Property	Patent	L-8628	2.27	MRO
Macassa Mine Property	Patent	8628		MRO
Macassa Mine Property	Patent	L-8629	17.4	MRO
Macassa Mine Property	Patent	8629		SR
Macassa Mine Property	Patent	HR 781	14.93	MRO (RECORDED AS L-12612), SR Town of Kirkland Lake
Macassa Mine Property	Patent	L-16478	16.09	MRO
Macassa Mine Property	Patent	26123		SRO

Macassa Mine Property	Patent	26125		SRO
Macassa Mine Property	Crown Lease	L-545717	19.96	MRO (SRO Town of Kirkland Lake)
Macassa Mine Property	Crown Lease	L-620179	6.22	Amalgamated Claim
Macassa Mine Property	Crown Lease	L-856962	12.3	MRO, (SR Town of Kirkland Lake)
Macassa Mine Property	Crown Lease	L-859820	5.61	MR
Macassa Mine Property	Crown lease	L-842970	13.52	MR SR Town of Kirkland Lake)
			822.44	
Kirkland West	Lease	L-496561	9.39	100% ownership in 2012
Kirkland West	Lease	L-496562	16.77	
Kirkland West	Lease	L-496563	17.13	
Kirkland West	Patent	L-1385	8.5	
Kirkland West	Patent	L-16480	16.09	
Kirkland West	Patent	L-16477	15.78	
Kirkland West	Patent	L-7711	8.61	
Kirkland West	Patent	L-6822	18.49	
Kirkland West	Patent	L-16513	18.29	
Kirkland West	Patent	L-16514	16.83	
Kirkland West	Patent	L-16515	18.41	
Kirkland West	Patent	L-16543	14.41	
Kirkland West	Patent	L-16546	12.95	
Kirkland West	Patent	L-16507	7.49	
Kirkland West	Patent	L-16509	15.22	
Kirkland West	Patent	L-16510	16.15	
Kirkland West	Patent	L-16511	16.29	
Kirkland West	Patent	L-16512	15.38	
			262.18	
Gracie West	Patent	L-16680	16.88	PRT MR
Gracie West	Patent	L-4230	14.77	MRO

Gracie West	Patent	L-4869	15.18	MRO
Gracie West	Patent	L-6842	17.2	MRO
Gracie West	Patent	L-6843	26.99	MRO
Gracie West	Patent	L-6863	24.56	MRO
Gracie West	Patent	L-9809	13.19	MRO
Gracie West	Patent	L-9810	12.95	MR, 190/400 interest.
Gracie West	Patent	L-9811	4.25	MRO
Gracie West	Patent	L-9812	15.46	MRO
Gracie West	Patent	L-9813	22.5	MRO
Gracie West	Patent	L-9814	10.52	MRO
Gracie West	Patent	L-16614	17.32	PRT MR
Gracie West	Lease	L-476845	10.65	SR&MR
Gracie West	Lease	L-476846, L-476847	34.41	MRO
Gracie West	Staked	L-892088	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
Gracie West	Staked	L-927914	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
Gracie West	Staked	L-927927	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
Gracie West	Staked	L-927921	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
Gracie West	Staked	L-892085	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
Gracie West	Staked Claim	L-4240384	16	STAKED, MRO, transferred all interest to KGI Sept. 2012
			352.83	
Gracie West (Axcell Claim)	Patent	L-5873	14.25	MRO
Trudel	Patent	L-5433	18.13	MRO
Morgan	Patent	L-5686	19.1	MRO, MTO To Transfer Mining Rights Under Highway
Morgan	Patent	L-5687	0.74	NW Fraction of claim
Morgan	Patent	L-6687	16.16	MRO, MTO To Transfer Mining Rights Under Highway
Morgan	Patent	L-6768	16.36	MRO, MTO To Transfer Mining Rights Under Highway

			52.36	
Hurd/Mistango/McCauley	Lease	Lease L-225112	10.18	MRO (10.182 Ha)
Hudson	Patent	L-2672	8.8	MRO
Hudson	Patent	L-2757	5.5	MRO
Hudson	RSC	RSC270	12.8	MRO
Hudson	RSC	RSC271	3.5	MRO
Hudson	Patent	L-1404	10.2	MRO
Hudson	Patent	L-2566	18.4	MRO
Hudson	Patent	L-2553	12.2	MRO
Hudson	Patent	L-1403	8.7	MRO
			80.1	
North Amalgamated	Part of Lease	Lease CLM 328	49.32	Work Report # 56458
		491182		
		491650		
		491662		
		500057		
		571358		
		524843		
Macassa Exploration Prop	Staked Claim	L-859695	16	MR
Macassa Exploration Prop	Staked Claim	L-983045	16	MR
Macassa Exploration Prop	Staked Claim	L-1045619	16	MR
Macassa Exploration Prop	Staked Claim	L-1045623	16	MR
Macassa Exploration Prop	Staked Claim	L-1049049	16	MR
Macassa Exploration Prop	Staked Claim	L-4210208	16	MR

Macassa Exploration Prop	Staked Claim	L-1213913	16	MR
Macassa Exploration Prop	Staked Claim	L-1213914	48	MR
Macassa Exploration Prop	Staked Claim	L-1214100	16	MR,
Macassa Exploration Prop	Staked Claim	L-1214365	32	MR
Macassa Exploration Prop	Staked Claim	L-1214366	16	MR
Macassa Exploration Prop	Staked Claim	L-1214367	32	MR
Macassa Exploration Prop	Staked Claim	L-1214368	16	MR
Macassa Exploration Prop	Staked Claim	L-1214369	48	MR
Macassa Exploration Prop	Staked Claim	L-1214370	16	MR
Macassa Exploration Prop	Staked Claim	L-1214371	32	MR
Macassa Exploration Prop	Staked Claim	L-1214372	32	MR
Macassa Exploration Prop	Staked Claim	L-1214373	64	MR
Macassa Exploration Prop	Staked Claim	L-1214374	32	MR
Macassa Exploration Prop	Staked Claim	L-1217446	16	MR
Macassa Exploration Prop	Staked Claim	L-1217447	48	MR
Macassa Exploration Prop	Staked Claim	L-1217448	64	MR
Macassa Exploration Prop	Staked Claim	L-1217450	64	MR
Macassa Exploration Prop	Staked Claim	L-1217451	64	MR
Macassa Exploration Prop	Staked Claim	L-1217452	16	MR
Macassa Exploration Prop	Staked Claim	L-1217455	16	MR
Macassa Exploration Prop	Staked Claim	L-1217479	64	MR
Macassa Exploration Prop	Staked Claim	L-1217759	64	MR
Macassa Exploration Prop	Staked Claim	L-1219980	16	MR
Macassa Exploration Prop	Staked Claim	L-1219981	96	MR

Macassa Exploration Prop	Staked Claim	L-3011230	16	MR
Macassa Exploration Prop	Staked Claim	L-1221710	32	MR, SR Crown/Town of Kirkland Lake, USA-Teck Gold Mines
Macassa Exploration Prop	Staked Claim	L-1222104	16	MR
Macassa Exploration Prop	Staked Claim	L-1222105	16	MR
Macassa Exploration Prop	Staked Claim	L-4245807	16	MRO
Macassa Exploration Prop	Staked Claim	L-4252740	16	MRO
Macassa Exploration Prop	Staked Claim	L-4252741	16	MRO
Macassa Exploration Prop	Staked Claim	L-4277249	16	MRO, staked in 2014
Macassa Exploration Prop	Staked Claim	L-4277250	16	MRO, staked in 2014
Macassa Exploration Prop	Staked Claim	L-4270898	16	MRO, staked in 2016
			1200	
McIvor (Do Not Include)	Patent	HS1170-3032		
	Patent	2911		
	Patent	2912		
	Patent	2913		
	Patent	2918		
	Patent	2919		
Williams East (near co-gen plant) Do Not Include	Patent	L2903		Not owned, SR John and Helen Rozich