

# IVANHOE MINES

NEW HORIZONS

**MANAGEMENT'S DISCUSSION AND ANALYSIS**

**FOR THE YEAR ENDED DECEMBER 31, 2019**

***DATED: MARCH 5, 2020***

## INTRODUCTION

This management's discussion and analysis (MD&A) should be read in conjunction with the audited consolidated financial statements of Ivanhoe Mines Ltd. ("Ivanhoe", "Ivanhoe Mines" or the "Company") for the years ended December 31, 2019 and 2018, which have been prepared in accordance with International Financial Reporting Standards (IFRS). All dollar figures stated herein are in U.S. dollars, unless otherwise specified. References to "C\$" mean Canadian dollars and references to "R" mean South African Rands.

The effective date of this MD&A is **March 5, 2020**. Additional information relating to the Company is available on SEDAR at [www.sedar.com](http://www.sedar.com). Certain statements contained in the MD&A are forward-looking statements that involve risks and uncertainties. See "*Forward-Looking Statements*" and "*Risk Factors*".

## FORWARD-LOOKING STATEMENTS

Certain statements in this MD&A constitute "forward-looking statements" or "forward-looking information" within the meaning of applicable securities laws. Such statements and information involve known and unknown risks, uncertainties and other factors that may cause the actual results, performance or achievements of the Company, its projects, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or information. Such statements can be identified by the use of words such as "may", "would", "could", "will", "intend", "expect", "believe", "plan", "anticipate", "estimate", "scheduled", "forecast", "predict" and other similar terminology, or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved. These statements reflect the Company's current expectations regarding future events, performance and results and speak only as of the date of this MD&A.

Such statements include without limitation, the timing and results of: (i) statements regarding first copper concentrate production at the Kakula Mine in Q3 2021; (ii) statements regarding the expansion in initial plant capacity of Kakula's processing plant modules from 3.0 Mtpa to 3.8 Mtpa; (iii) statements regarding the updated estimate of Kakula's initial capital costs is approximately \$1.3 billion as of January 1, 2019, which assumes commissioning of the processing plant in Q3 2021 and includes expanded plant capacity and pre-production ore stockpiles; (iv) statements regarding the expected completion of Platreef's Shaft 1 to a final depth of approximately 1,000 metres is planned for mid-2020; (v) statements regarding Platreef's Shaft 2 will have an internal diameter of 10 metres and will be equipped with two Koepe winding plants, one equipped with 40-tonne rock-hoisting skips with a capacity to hoist a total of six million tonnes of ore per year; (vi) statements regarding Ivanhoe's investigation of a phased development production plan for the Platreef Project, targeting significantly lower initial capital, to accelerate first production by using Shaft 1 as the mine's initial production shaft, followed by expansions to the production rate as outlined in the definitive feasibility study (DFS); (vii) statements regarding the three development stations in Platreef's Shaft 1 will provide initial, underground access to the high-grade orebody, enabling mine development to proceed concurrently with the construction of Shaft 2; (viii) statements regarding the planned mining methods at Platreef will use highly productive, mechanized methods, including long-hole stoping and drift-and-fill mining, and that each method will utilize cemented backfill for maximum ore extraction; (ix) statements regarding an independent DFS for the Kakula Mine is underway with an expected completion date of Q3 2020, and at the same time, Ivanhoe expects to issue an updated preliminary economic assessment for the expanded Kamoa-Kakula combined production scenario that will include an updated Mineral Resource estimate for Kamoa North, including the initial Mineral Resource estimate for the Kamoa North Bonanza Zone; (x) statements regarding the forthcoming Kakula DFS will incorporate detailed design, engineering and procurement, with the plans to increase the initial processing plant ore capacity by approximately 26% from 3.0 Mtpa to 3.8 Mtpa; (xi) statements that based on the results of the February 2019 pre-feasibility study (PFS), Kakula's average feed grade over the first five years of operations is projected to be 6.8% copper, and 5.5% copper on average over a 25-year mine life, and an increase in the initial processing plant throughput is expected to result in improved cash flows, which may be used to accelerate subsequent expansions; (xii) statements regarding Ivanhoe's

expectation that it will continue to have sufficient cash resources or project-related financing options available to cover its share of the potential increase in initial capital costs; (xiii) statements regarding the progressive re-commissioning of the turbines at the Mwadingusha hydropower plant in the DRC, fully refurbished and modernized with state-of-the-art control and instrumentation, is underway and is expected to be completed in Q3 2020, and that the refurbished plant is projected to deliver approximately 72 megawatts of power to the national power grid; (xiv) statements regarding the Company's COVID-19 Response Plan (including the review of purchase orders and its supply chain to minimize disruption to its projects); and (xv) statements regarding the expected expenditure for 2020 of \$60 million on further development at the Platreef Project; \$40 million at the Kipushi Project; \$16 million on regional exploration in the DRC; and \$30 million on corporate overheads for 2020 – as well as its proportionate funding of the Kamoa-Kakula Project, expected to be \$400 million for 2020.

As well, all of the results of the pre-feasibility study for the Kakula copper mine and the updated and expanded Kamoa-Kakula Project preliminary economic assessment, the feasibility study of the Platreef Project and the pre-feasibility study of the Kipushi Project, constitute forward-looking statements or information, and include future estimates of internal rates of return, net present value, future production, estimates of cash cost, proposed mining plans and methods, mine life estimates, cash flow forecasts, metal recoveries, estimates of capital and operating costs and the size and timing of phased development of the projects. Furthermore, with respect to this specific forward-looking information concerning the development of the Kamoa-Kakula, Platreef and Kipushi projects, the Company has based its assumptions and analysis on certain factors that are inherently uncertain. Uncertainties include: (i) the adequacy of infrastructure; (ii) geological characteristics; (iii) metallurgical characteristics of the mineralization; (iv) the ability to develop adequate processing capacity; (v) the price of copper, nickel, zinc, platinum, palladium, rhodium and gold; (vi) the availability of equipment and facilities necessary to complete development; (vii) the cost of consumables and mining and processing equipment; (viii) unforeseen technological and engineering problems; (ix) accidents or acts of sabotage or terrorism; (x) currency fluctuations; (xi) changes in regulations; (xii) the compliance by joint venture partners with terms of agreements; (xiii) the availability and productivity of skilled labour; (xiv) the regulation of the mining industry by various governmental agencies; (xv) the ability to raise sufficient capital to develop such projects; (xiv) changes in project scope or design, and (xv) political factors.

This MD&A also contains references to estimates of Mineral Resources and Mineral Reserves. The estimation of Mineral Resources is inherently uncertain and involves subjective judgments about many relevant factors. Estimates of Mineral Reserves provide more certainty but still involve similar subjective judgments. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The accuracy of any such estimates is a function of the quantity and quality of available data, and of the assumptions made and judgments used in engineering and geological interpretation (including estimated future production from the Company's projects, the anticipated tonnages and grades that will be mined and the estimated level of recovery that will be realized), which may prove to be unreliable and depend, to a certain extent, upon the analysis of drilling results and statistical inferences that ultimately may prove to be inaccurate. Mineral Resource or Mineral Reserve estimates may have to be re-estimated based on: (i) fluctuations in copper, nickel, zinc, platinum group elements (PGE), gold or other mineral prices; (ii) results of drilling; (iii) metallurgical testing and other studies; (iv) proposed mining operations, including dilution; (v) the evaluation of mine plans subsequent to the date of any estimates and/or changes in mine plans; (vi) the possible failure to receive required permits, approvals and licences; and (vii) changes in law or regulation.

Forward-looking statements and information involve significant risks and uncertainties, should not be read as guarantees of future performance or results and will not necessarily be accurate indicators of whether or not such results will be achieved. A number of factors could cause actual results to differ materially from the results discussed in the forward-looking statements or information, including, but not limited to, the factors discussed below and under "Risk Factors", and elsewhere in this MD&A, as well as unexpected changes in laws, rules or regulations, or their enforcement by applicable authorities; the failure of parties to contracts with the Company to perform as agreed; social or labour unrest; changes

in commodity prices; and the failure of exploration programs or studies to deliver anticipated results or results that would justify and support continued exploration, studies, development or operations.

Although the forward-looking statements contained in this MD&A are based upon what management of the Company believes are reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward-looking statements. These forward-looking statements are made as of the date of this MD&A and are expressly qualified in their entirety by this cautionary statement. Subject to applicable securities laws, the Company does not assume any obligation to update or revise the forward-looking statements contained herein to reflect events or circumstances occurring after the date of this MD&A.

The Company's actual results could differ materially from those anticipated in these forward-looking statements as a result of the factors set forth below in the "Risk Factors" section beginning on page 49 and elsewhere in this MD&A.

## REVIEW OF OPERATIONS

Ivanhoe Mines is a mineral exploration and development company. The Company's financial performance is primarily affected by ongoing exploration and development activities being conducted at its three material properties. The Company has no producing properties and does not have operating revenues. The Company expects to fund all of its exploration and development activities through debt and equity financing until operating revenues are generated. The Company's material properties consist of:

- **The Platreef Project.** Construction of the planned Platreef Mine is now underway on the Company's discovery of platinum, palladium, nickel, copper, gold and rhodium on the Northern Limb of South Africa's Bushveld Igneous Complex. Ivanhoe Mines holds a 64% interest in Platreef, the South African beneficiaries of a broad-based, black economic empowerment structure have a combined 26% stake in the Platreef Project and the remaining 10% is owned by a Japanese consortium of ITOCHU Corporation, Japan Oil, Gas and Metals National Corporation; and Japan Gas Corporation. (See "*Platreef Project*")
- **The Kipushi Project.** The existing Kipushi Mine is located on the Central African Copperbelt in the Democratic Republic of Congo's (DRC) southern Haut-Katanga province, one of Africa's major mining hubs. The mine, which operated between 1924 and 1993, is approximately 30 kilometres southwest of the provincial capital, Lubumbashi, and less than one kilometre from the DRC-Zambia border. Ivanhoe Mines holds a 68% interest in Kipushi; the state-owned mining company, La Générale des Carrières et des Mines (Gécamines), holds the remaining 32% interest. (See "*Kipushi Project*")
- **The Kamoa-Kakula Project.** A joint venture between Ivanhoe Mines and Zijin Mining Group Co., Ltd., ("Zijin" or "Zijin Mining") within the Central African Copperbelt in the DRC's southern Lualaba province. Following the signing of an agreement with the DRC government in November 2016 to transfer an additional 15% interest in the Kamoa-Kakula Project to the government of the DRC, Ivanhoe Mines and Zijin Mining each hold an indirect 39.6% interest in the Kamoa-Kakula Project, Crystal River Global Limited (Crystal River) holds an indirect 0.8% interest and the DRC government holds a direct 20% interest. The Kamoa-Kakula Project is independently ranked as the world's fourth largest copper deposit by international mining consultant Wood Mackenzie. (See "*Kamoa-Kakula Project*")



## **COVID-19 Response Plan**

Ivanhoe Mines is closely monitoring the impact of the COVID-19 virus and is prepared for potential short-term impacts on its projects and operations worldwide. The Company has appointed a team with overall responsibility for COVID-19 response planning, which includes senior Ivanhoe Mines representatives with expertise in health and safety, operations, law, human resources, and communications as well as outside counsel from world-leading epidemiologists. As part of its COVID-19 Response Plan, the Company is putting particular focus on the health and safety of all its employees and contractors as well as its host communities. In addition, the Company is conducting a careful review of purchase orders and its supply chain to minimize disruption to its projects.

## **PLATREEF PROJECT**

The Platreef Project is owned by Ivanplats (Pty) Ltd (Ivanplats), which is 64%-owned by Ivanhoe Mines. A 26% interest is held by Ivanplats' historically-disadvantaged, broad-based, black economic empowerment (B-BBEE) partners, which include 20 local host communities with approximately 150,000 people, project employees and local entrepreneurs. In Q2 2019, Ivanplats reached Level 2 contributor status in its verification assessment on the B-BBEE scorecard. A Japanese consortium of ITOCHU Corporation, Japan Oil, Gas and Metals National Corporation; and Japan Gas Corporation, owns a 10% interest in Ivanplats, which it acquired in two tranches for a total investment of \$290 million.

**Photo: Aerial view of the Platreef Project, with Shaft 1's headframe and the boxcut and concrete shaft collar foundation for Shaft 2. Ivanhoe is looking into accelerating first production by using Shaft 1 as the mine's initial production shaft.**



The Platreef Project hosts an underground deposit of thick, platinum-group metals, nickel, copper and gold mineralization on the Northern Limb of the Bushveld Igneous Complex in Limpopo Province, approximately 280 kilometres northeast of Johannesburg and eight kilometres from the town of Mokopane.

On the Northern Limb, platinum-group metals mineralization is hosted primarily within the Platreef, a mineralized sequence that is traced more than 30 kilometres along strike. Ivanhoe's Platreef Project, within the Platreef's southern sector, is comprised of two contiguous properties: Turfspruit and Macalacaskop. Turfspruit, the northernmost property, is contiguous with, and along strike from, Anglo Platinum's Mogalakwena group of mining operations and properties.

Since 2007, Ivanhoe has focused its exploration and development activities on defining and advancing the down-dip extension of its original discovery at Platreef, now known as the Flatreef Deposit, which is amenable to highly mechanized, underground mining methods. The Flatreef area lies entirely on the Turfspruit and Macalacaskop properties, which form part of the Company's mining right.

### ***Health and safety at Platreef***

At the end of 2019, the Platreef Project reached a total of 171,525 lost-time, injury-free hours worked in accordance with South Africa's Mine Health and Safety Act, and Occupational Health and Safety Act. Unfortunately a lost-time injury (LTI) occurred in November 2019. The Platreef Project continues to strive toward its workplace objective of an environment that causes zero harm to employees, contractors, sub-contractors and consultants.

### ***Positive independent, definitive feasibility study; Platreef projected to be Africa's lowest-cost producer of platinum-group metals***

In July 2017, Ivanhoe Mines announced the results of an independent, definitive feasibility study (DFS) for the then planned first phase of the Platreef Project's palladium-platinum-nickel-copper-gold-rhodium mine in South Africa.

The Platreef DFS covered a four million tonnes per annum first phase of development that would include construction of a state-of-the-art underground mine, concentrator and other associated infrastructure to support initial production of concentrate. As Phase 1 is being developed and commissioned, there would be opportunities to refine the timing and scope of subsequent phases of expanded production.

The 2017 DFS highlights include:

- Indicated Mineral Resources containing an estimated 41.9 million ounces of platinum, palladium, rhodium and gold, with an additional 52.8 million ounces of platinum, palladium, rhodium and gold in Inferred Resources.
- Mineral Reserves containing 17.6 million ounces of platinum, palladium, rhodium and gold following stope optimization and mine sequencing work.
- Development of a large, safe, mechanized, underground mine, with an initial four-Mtpa concentrator and associated infrastructure.
- Planned initial average annual production rate of 476,000 ounces of platinum, palladium, rhodium and gold (3PE+Au), plus 21 million pounds of nickel and 13 million pounds of copper.
- Estimated pre-production capital requirement of approximately \$1.5 billion, at a ZAR:USD exchange rate of 13 to 1.
- Platreef would rank at the bottom of the cash-cost curve, at an estimated \$351 per ounce of 3PE+Au produced, net of by-products and including sustaining capital costs, and \$326 per ounce before sustaining capital costs.

- After-tax net present value (NPV) of \$916 million, at an 8% discount rate.
- After-tax internal rate of return (IRR) of 14.2%.

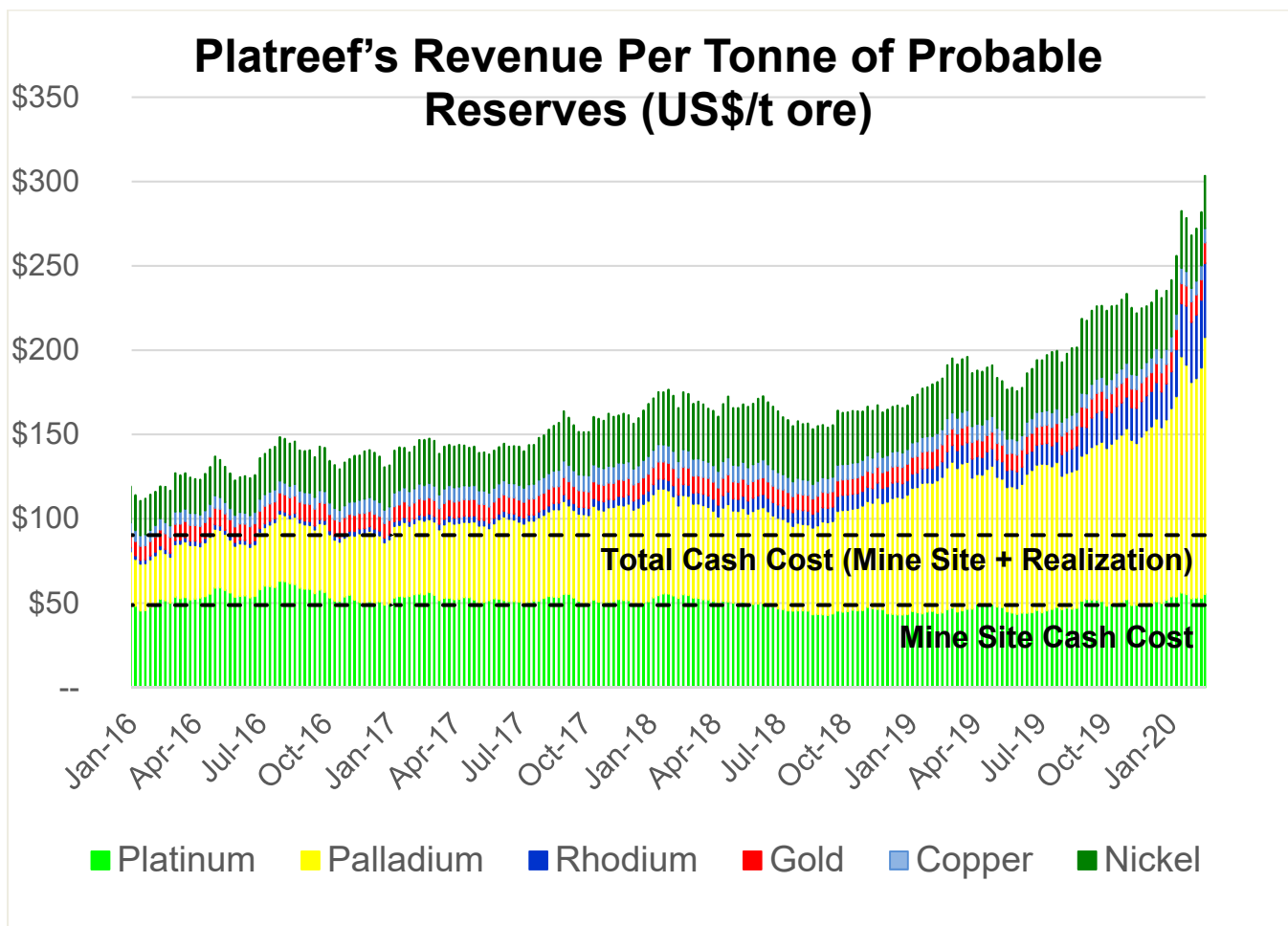
All figures are on a 100%-project basis unless otherwise stated. The DFS was prepared for Ivanhoe Mines by principal consultant DRA Global, with economic analysis led by OreWin, and specialized sub-consultants including Amec Foster Wheeler E&C Services, Stantec Consulting, Murray & Roberts Cementation, SRK Consulting, Golder Associates and Digby Wells Environmental.

### ***Platreef phased development production plan***

During 2019 and early 2020, palladium prices have continued to surge to new record highs, recently topping \$2,800 an ounce as stricter air-quality rules boost demand for the metal used in vehicle pollution-control devices, while the price of rhodium hit a record high of more than \$12,700 an ounce. The price increases have propelled Ivanhoe's Platreef Project 'metals-price basket' to a new, multi-year high.

Given the recent surge in Platreef's 'metals-price basket', Ivanhoe Mines is investigating a phased development production plan for the Platreef Project, targeting significantly lower initial capital, to accelerate first production by using Shaft 1 as the mine's initial production shaft. This plan will focus on initially targeting the development of mining zones accessible from Shaft 1 and maximizing the hoisting capacity of this shaft, followed by expansions to the production rate as outlined in the DFS.

**Figure 1: Led by the surge in prices of palladium and rhodium, Platreef's 'metals-price basket' revenue per tonne of probable reserves recently reached a new, all-time high of more than \$300.**



## ***Platreef Mineral Resources***

The Platreef Project's Mineral Resource estimate was prepared for Ivanhoe Mines under the direction of Dr. Harry Parker, RM SME, of Amec Foster Wheeler. Dr. Parker and Timothy Kuhl, RM SME, also of Amec Foster Wheeler, have independently confirmed the Mineral Resource estimate and are the Qualified Persons for the estimate, which has an effective date of April 22, 2016.

The Flatreef Mineral Resource, with a strike length of 6.5 kilometres, lies predominantly within a flat-to-gently-dipping portion of the Platreef mineralized belt at relatively shallow depths of approximately 500 metres to 1,350 metres below the surface. The Flatreef Deposit is characterized by its very large vertical thicknesses of high-grade mineralization.

The Platreef Indicated Mineral Resources for all mineralized zones are 346 million tonnes at a grade of 3.77 grams per tonne (g/t) 3PE+gold (1.68 g/t platinum, 1.70 g/t palladium, 0.11 g/t rhodium, 0.28 g/t gold), 0.32% nickel and 0.16% copper at a 2.0 g/t 3PE+gold cut-off. The average thickness of the 2.0 g/t 3PE+gold grade shell used to constrain the T2MZ resources for the indicated area is 19 metres.

Inferred mineral resources for all mineralized zones are 506 million tonnes at a grade of 3.24 g/t 3PE+gold (1.42 g/t platinum, 1.46 g/t palladium, 0.10 g/t rhodium, 0.26 g/t gold), 0.31% nickel and 0.16% copper. The average thickness of the 2.0 g/t 3PE+gold grade shell used to constrain the T2MZ resources for the inferred area is 12.7 metres.

### ***Shaft 1 now extends to a depth of more than 957 metres below surface***

Shaft 1 reached the top of the high-grade Flatreef Deposit (T1 mineralized zone) at a depth of 780.2 metres below surface in Q3 2018 and has since been extended to a depth of more than 957 metres below surface. The thickness of the mineralized orebody (T1 and T2 mineralized zones) at Shaft 1 is 29 metres, with grades of platinum-group metals ranging up to 11 grams per tonne (g/t) 3PE (platinum, palladium and rhodium) plus gold, as well as significant quantities of nickel and copper. The 29-metre intersection yielded approximately 3,000 tonnes of ore, estimated to contain more than 400 ounces of platinum-group metals. The ore is stockpiled on surface for further metallurgical sampling.

The 750-metre-level and 850-metre-level stations have both been completed with the 950-metre-level station currently in development and approximately 80% completed. Development is being carried out on the east drift of the 950-metre-level with the north drift and temporary refuge bay completed.

The final shaft bottom depth has been revised to 1,000 metres below surface in order to cater for a long-term life of mine spillage arrangement. This projected final depth is expected to be reached in mid-2020. The three development stations will provide initial, underground access to the high-grade orebody, enabling mine development to proceed concurrently with the construction of Shaft 2. Shaft 1 changeover detailed designs have commenced and will enable Shaft 1 to be configured for permanent rock hoisting.

### ***Shaft 2 box cut and concrete foundation completed in July 2019***

Shaft 2, located approximately 100 metres northeast of Shaft 1, will have an internal diameter of 10 metres. It will be lined with concrete and sunk to a planned, final depth of more than 1,104 metres below surface. It will be equipped with two Koepe winding plants, one equipped with 40-tonne rock-hoisting skips capable of hoisting a total of six million tonnes of ore a year – the single largest hoisting capacity at any mine in Africa.

The headgear for the permanent hoisting facility was designed by South Africa-based Murray & Roberts Cementation. The box-cut excavation to a depth of approximately 29 metres below surface, including the concrete foundation, has been successfully completed and will form the foundation of the 103-metre-tall concrete headgear that will house the shaft's permanent hoisting facilities and support the shaft collar.



Work on Shaft 2 has been temporarily deferred while the Company completes its review of the phased development production plan using Shaft 1 as the mine's initial production shaft.

### ***Underground mining to incorporate highly productive, mechanized methods***

The mining zones in the current Platreef mine plan occur at depths ranging from approximately 700 metres to 1,200 metres below surface. Shaft 2 will provide primary access to the mining zones; secondary access will be via Shaft 1. During mine production, both shafts also will serve as ventilation intakes. Three additional ventilation exhaust raises are planned to achieve steady-state production.

Planned mining methods will use highly productive, mechanized methods, including long-hole stoping and drift-and-fill mining. Each method will utilize cemented backfill for maximum ore extraction. The ore will be hauled from the stopes to a series of internal ore passes and fed to the bottom of Shaft 2, where it will be crushed and hoisted to surface.

**Photo: Members of the sinking crew at the Platreef Project's Shaft 1.**



### ***Long-term supply of bulk water secured for the Platreef Mine***

On May 7, 2018, Ivanhoe announced the signing of a new agreement to receive local, treated water to supply most of the bulk water needed for the first phase of production at Platreef. The Mogalakwena Local Municipality has agreed to supply a minimum of five million litres of treated water a day for 32 years, beginning in 2022, from the town of Mokopane's new Masodi Treatment Works. Initial supply will be used in Platreef's ongoing underground mine development and surface infrastructure construction.

Under the terms of the agreement, which is subject to certain suspensive conditions, Ivanplats will provide financial assistance to the municipality for certified costs of up to a maximum of R248 million

(approximately \$16 million) to complete the Masodi treatment plant. Ivanplats will purchase the treated wastewater at a reduced rate of R5 per thousand litres for the first 10 million litres per day to offset a portion of the initial capital contributed.

Ivanplats received its Integrated Water Use Licence in January 2019, which is valid for 30 years and enables the Platreef Project to make use of water as planned in the 2017 DFS.

**Photo: Ivanhoe has prioritized an increase in the number of female employees at all three of our mine development projects. At Platreef, females now make up more than 31% of the project's employees. From left to right: Raisibe Ntini (Geology Intern); Vongani Nkuna (Group Manager, Metallurgy); Maenetja Lebea (Intermediate Life Support Practitioner); Ayakha Mbongonya (Geotechnical Engineer); Sinah Tjale (Safety Officer).**



### ***Development of human resources and job skills***

The Platreef Project's first Social and Labour Plan (SLP), towards which it pledged a total of R160 million (\$11 million) during the past five years, ended in November 2019. That approved plan included R67 million (\$4 million) for the development of job skills among local residents and R88 million (\$6 million) for local economic development projects. Consultation regarding the project's second SLP is in the final stages.



## KIPUSHI PROJECT

The Kipushi copper-zinc-germanium-lead mine, in the DRC, is adjacent to the town of Kipushi and approximately 30 kilometres southwest of Lubumbashi. It is located on the Central African Copperbelt, approximately 250 kilometres southeast of the Kamoia-Kakula Project and less than one kilometre from the Zambian border. Ivanhoe acquired its 68% interest in the Kipushi Project in November 2011; the balance of 32% is held by the state-owned mining company, Gécamines.

### *Health, safety and community development*

At the end of 2019, the Kipushi Project reached a total of 1,887,093 work hours free of a lost-time injury.

The Kipushi Project operates a potable-water station to supply the municipality of Kipushi with water. This includes power supply, disinfectant chemicals, routine maintenance, security and emergency repair of leaks to the primary reticulation. The Kipushi Project also installed and commissioned new overhead powerlines to the pump station. Other community development projects continued during 2019 included the Kipushi women's literacy project, the sewing training centre project and the upgrading of the Mungoti School in Kipushi.

**Photo: Ivanhoe Mines and its joint-venture partners have committed to bringing clean water solutions to local communities near all of its mining projects. A potable water storage tank at a small village near the Kipushi Mine, where 700 families collect their daily water.**



**Photo: Ivanhoe also funds an adult literacy program as part of its community skills development initiative at Kipushi. The program is a partnership with Alfa Congo, a Kinshasa-based non-profit NGO dedicated to improving literacy levels among vulnerable social groups.**



### ***Kipushi Mineral Resources***

The Kipushi Project's current Mineral Resource estimate was updated with an effective date of June 14, 2018, and was prepared by the MSA Group of Johannesburg, South Africa, in compliance with 2014 CIM Definition Standards. Ivanhoe filed an updated National Instrument 43-101 (NI 43-101) technical report for the Kipushi Project covering the June 2018 Mineral Resource in March 2019. The technical report is filed on the Company's website and under the Company's SEDAR profile at [www.sedar.com](http://www.sedar.com).

Zinc rich Measured and Indicated Mineral Resources, primarily in the Big Zinc Zone total 11.78 million tonnes at grades of 35.34% zinc, 0.80% copper, 23 g/t silver and 64 g/t germanium, at a 7% zinc cut-off – containing an estimated 9.2 billion pounds of zinc. Zinc-rich Inferred Mineral Resources total an additional 1.14 million tonnes at grades of 33.77% zinc, 1.24% copper, 12 g/t silver and 62 g/t germanium. The Inferred Mineral Resources are contained partly in the Big Zinc Zone and partly in the Southern Zinc Zone.

Copper-rich Measured and Indicated Mineral Resources contained in the adjacent Fault Zone, Fault Zone Splay and Série Récurrente Zone total an additional 2.29 million tonnes at grades of 4.03% copper, 2.85% zinc, 21 g/t silver and 19 g/t germanium, at a 1.5% copper cut-off – containing 204 million pounds of copper. Copper-rich Inferred Mineral Resources in these zones total an additional 0.44 million tonnes at grades of 3.89% copper, 10.77% zinc, 19 g/t silver and 55 g/t germanium.



**Photo: Kipushi's construction team assisting in civil works for the new 850-metre-level pumping station that will significantly reduce power consumption and electricity costs during production. From left to right: K. Mudikike, M. Kalula, K. Mukendi, G. Graham, P. Dikwenda, K. Nyandwe, M. Ngoyi, M. Mutomb, E. Ditend.**



### ***Definitive feasibility study in final stages of completion***

The Kipushi Project's PFS, announced by Ivanhoe Mines on December 13, 2017, anticipated annual production of an average of 381,000 tonnes of zinc concentrate over an 11-year, initial mine life at a total cash cost of approximately \$0.48 per pound (lb) of zinc.

Highlights of the PFS, based on a long-term zinc price of \$1.10/lb include:

- After-tax net present value (NPV) at an 8% real discount rate of \$683 million.
- After-tax real internal rate of return (IRR) of 35.3%.
- After-tax project payback period of 2.2 years.
- Pre-production capital costs, including contingency, estimated at \$337 million.
- Existing surface and underground infrastructure allows for significantly lower capital costs than comparable greenfield development projects.
- Life-of-mine average planned zinc concentrate production of 381,000 dry tonnes per annum, with a concentrate grade of 59% zinc, is expected to rank Kipushi, once in production, among the world's largest zinc mines.

All figures are on a 100%-project basis unless otherwise stated. Estimated life-of-mine average cash cost of \$0.48/lb of zinc is expected to rank Kipushi, once in production, in the bottom quartile of the cash-cost curve for zinc producers internationally.

The project team continues to work towards the completion of the Kipushi Project's definitive feasibility study (DFS).



**Photo: Alfons Molepo, Senior Electrical Foreman (left), discussing the electrical drawings with Tshilay Pascal, Electrician (right), at the newly installed, medium voltage switchgear at the 850-metre-level pump station.**



**Photo: Prince Kaomba, Electrician (left), and Paul Dikwenda, Mining Manager (right), inspecting diagrams of the 17.5-megawatt variable speed drives for the five high-volume water pumps installed on Kipushi's 1,200-metre level.**



## ***Geology and exploration***

Geological work in Q1 2019 was focused on obtaining additional information required for the DFS, as well as planning the geological delineation-drilling and grade-control program for underground mine development. The design criteria for the delineation drilling will target areas along the edge of the Big Zinc, which presently are inaccessible from the historic workings. No new geological and exploration work was conducted during the remainder of the year.

## ***Project development and infrastructure***

Significant progress has been made in modernizing the Kipushi Mine's underground infrastructure as part of preparations for the mine to resume commercial production, including upgrading a series of vertical mine shafts to various depths, with associated head frames, as well as underground mine excavations and infrastructure. A series of crosscuts and ventilation infrastructure still is in working condition and have been cleared of old materials and equipment to facilitate modern, bulk mechanized mining. The underground infrastructure also includes a series of pumps to manage the mine's water levels, which now are easily maintained at the bottom of the mine.

Shaft 5 is eight metres in diameter and 1,240 metres deep. It now has been upgraded and re-commissioned. The main personnel and material winder has been upgraded and modernized to meet international industry standards and safety criteria. The Shaft 5 rock-hoisting winder now is fully operational with new rock skips, new head- and tail-ropes, and attachments installed. The two newly manufactured rock conveyances (skips) and the supporting frames (bridles) have been installed in the shaft to facilitate the hoisting of rock from the main ore and waste storage silos feeding rock on the 1,200-metre level.

The main haulage way on the 1,150-metre level, between the Big Zinc access decline and Shaft 5 rock load-out facilities, has been resurfaced with concrete so the mine now can use modern, trackless, mobile machinery. A new truck-tipping bin, which feeds into the large-capacity rock crusher located directly below, has been installed on this level. The old winder at P2 Shaft has been removed and construction of the new foundation, along with assembly and installation of the new modern winder, has been completed and fully commissioned after passing safety inspection and testing procedures.



## KAMOA-KAKULA PROJECT

The Kamoa-Kakula Project, a joint venture between Ivanhoe Mines and Zijin Mining, has been independently ranked as the world's fourth largest copper deposit by international mining consultant Wood Mackenzie. The project is approximately 25 kilometres west of the town of Kolwezi and about 270 kilometres west of Lubumbashi.

Ivanhoe sold a 49.5% share interest in Kamoa Holding Limited (Kamoa Holding) to Zijin Mining in December 2015 for an aggregate consideration of \$412 million. In addition, Ivanhoe sold a 1% share interest in Kamoa Holding to privately-owned Crystal River for \$8.32 million - which Crystal River will pay through a non-interest-bearing, 10-year promissory note. Since the conclusion of the Zijin transaction in December 2015, each shareholder has been required to fund expenditures at the Kamoa-Kakula Project in an amount equivalent to its proportionate shareholding interest in Kamoa Holding.

A 5%, non-dilutable interest in the Kamoa-Kakula Project was transferred to the DRC government on September 11, 2012 for no consideration, pursuant to the 2002 DRC mining code. Following the signing of an agreement with the DRC government in November 2016, in which an additional 15% interest in the Kamoa-Kakula Project was transferred to the DRC government, Ivanhoe and Zijin Mining now each hold an indirect 39.6% interest in the Kamoa-Kakula Project, Crystal River holds an indirect 0.8% interest and the DRC government holds a direct 20% interest. Kamoa Holding holds an 80% interest in the project.

**Photo: Wide-angle, aerial view of Kakula's main declines (centre), ore stockpiles (right), Kakula workshops under construction (left) and the first phase of accommodations for 1,000 employees and contractors (upper centre).**



### ***Health and safety at Kamoa-Kakula***

At the end of 2019, the Kamoa-Kakula Project reached 2,629,889 work hours free of a lost-time injury. Regrettably a fatality occurred in September 2019 and on February 7, 2020, the Company reported that a contractor's employee passed away due to fat embolism syndrome causing severe brain damage following a broken bone incurred in a workplace accident on January 21, 2020 at the Kamoa-Kakula Project. These two incidents occurred after the project had gone more than 7.5 years without a lost-time

injury. The Kamoa-Kakula Project continues to strive toward its workplace objective of an environment that causes zero harm to all employees and contractors.

**Photo: Approximately 90% of Kamoa-Kakula's more than 4,400 current employees and contractors are Congolese nationals. A training program is in place to increase the number of local employees in management positions.**



### ***Definitive Feasibility Study underway for the Kakula Mine***

An independent definitive feasibility study (DFS) for the Kakula Mine is underway with an expected completion date of Q3 2020. At the same time, Ivanhoe expects to issue an updated preliminary economic assessment for the expanded Kamoa-Kakula combined production scenario that will include an updated Mineral Resource estimate for Kamoa North, including the initial Mineral Resource estimate for the Kamoa North Bonanza Zone.

The forthcoming Kakula DFS will incorporate detailed design, engineering and procurement, which is largely complete, with plans to increase the initial processing plant ore capacity by approximately 26% from 3.0 Mtpa to 3.8 Mtpa.

Based on the results of the February 2019 PFS, Kakula's average feed grade over the first five years of operations is projected to be 6.8% copper, and 5.5% copper on average over a 25-year mine life. An increase in the initial processing plant throughput is expected to result in improved cash flows, which may be used to accelerate subsequent expansions.

### ***Additional mining crews being added at Kakula to increase pre-production ore stockpiles and to position the mine to accelerate commencement of the second phase of development***

The expansion in initial plant capacity from 3.0 Mtpa to 3.8 Mtpa would require increasing the underground mining crews in 2020 from 11 to 14 to ensure sufficient mining operations to feed the expanded plant throughput. This would have the benefit of producing a larger surface stockpile of ore



prior to the scheduled commissioning of the processing plant, as well as accelerating the mine development schedule, providing the opportunity to bring forward the commencement of the second phase of development at Kakula. The second 3.8 Mtpa plant module will be fed from the Kakula Mine at a planned full production rate of 6 Mtpa. Further study work will determine the amount of tonnes to be sourced from the Kansoko Mine, or elsewhere, to maximize the full milling capacity of 7.6 Mtpa. Any plans to accelerate the second module of Kakula's processing plant would be subject to securing the necessary project-level financing.

Kakula's original 3.0 Mtpa first processing plant module has already been redesigned during the basic engineering phase to a nameplate capacity of 3.8 Mtpa. Purchase orders have been placed for all major long-lead time mechanical equipment, and plant civil works have started. The contract for the SMPP (structural, mechanical, piping and platework) supply and erection portion of the plant construction has been awarded and steel fabrication is underway. The capital cost estimate related to the construction of the processing plant has been estimated to a basic engineering level of accuracy and is thus well defined.

**Photo: The first oversize loads of equipment for Kakula's initial 3.8 Mtpa processing plant module being transported from Kolwezi to Kamo-Kakula on the newly constructed road. The equipment, which has been delivered to site, is two low-entrainment flotation cells (Jamison cells) that will be used as cleaner cells to produce a final copper concentrate, before thickening and filtration.**



The current updated estimate of the project's initial capital costs is approximately \$1.3 billion as of January 1, 2019, which assumes commissioning of the first processing plant module in Q3 2021 and includes expanded plant capacity and pre-production ore stockpiles.

The capital costs incurred by the Kamo-Kakula joint venture in 2019 amounted to \$309.1 million, of which \$125.2 million was spent on the Kakula declines and mine development.

Ivanhoe will fund its share of approximately 40% of the initial capital costs, plus it will fund its share of capital associated with the 20% carried interest owned by the Government of the DRC, a portion which will be repaid through future cash flows from the project. Ivanhoe expects that it will continue to have sufficient cash resources or project-related financing options available to cover its share of the potential increase in initial capital costs.

## ***Kamoa-Kakula Mineral Resources increased again***

Ivanhoe announced the completion of an independently-verified, updated Mineral Resource estimate for the Kamoa-Kakula Project on February 5, 2020. The new Mineral Resource estimate is the culmination of an infill drilling program designed to better define higher-grade copper zones within the existing Kamoa Deposit.

At a 1% cut-off, Kamoa's Indicated Mineral Resources now total 760 million tonnes grading 2.73% copper, containing 45.8 billion pounds of copper. At the same 1% cut-off, Kamoa's Inferred Mineral Resources now total 235 million tonnes grading 1.70% copper, containing 8.8 billion pounds of copper. At a 3% cut-off, the new Mineral Resource estimate boosts the Kamoa Deposit's Indicated Mineral Resource tonnages by 15% and contained copper by 15.5%, to a total of 256 million tonnes at a grade of 4.15% copper. At the same 3% cut-off, Kamoa's Inferred Mineral Resources now total 13 million tonnes at a grade of 3.51% copper.

The entire Kamoa Deposit was updated in the new Mineral Resource estimate. The majority of recent drilling, however, targeted the ultra-high-grade Bonanza Zone at Kamoa North, and an approximated north-south corridor of elevated copper grades in the far north of the mining licence area (the Far North Zone).

The new Kamoa Mineral Resource estimate covers approximately 600 metres of strike length in the deeper western portions of the Bonanza Zone (west of the West Scarp Fault), and 1,500 metres of strike length in the shallower eastern portions of the Bonanza Zone, defined by drill sections spaced 50 metres apart on strike in the central section, and 100 metres apart on strike elsewhere.

At a 1% cut-off, the current, combined Indicated Mineral Resources for the Kamoa-Kakula Project now totals 1.387 billion tonnes grading 2.74% copper, containing 83.7 billion pounds of copper. At the same 1% cut-off, Kamoa-Kakula's combined Inferred Mineral Resources now total 339 million tonnes grading 1.68% copper, containing 12.5 billion pounds of copper.

At a higher 3% cut-off, the current, combined Indicated Mineral Resources for the Kamoa-Kakula Project now totals 423 million tonnes grading 4.68% copper, containing 43.7 billion pounds of copper. At the same 3% cut-off, Kamoa-Kakula's combined Inferred Mineral Resources now total 17 million tonnes grading 3.51% copper, containing 1.3 billion pounds of copper.

The new Kamoa Indicated and Inferred Mineral Resource estimate was prepared by George Gilchrist, Ivanhoe Mines' Vice President, Resources, under the direction of Gordon Seibel, RM SME, of the Wood Group (formerly Amec Foster Wheeler E&C Services Inc.) of Reno, USA, and is reported in accordance with the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves. Mr. Seibel is the Qualified Person for the estimate. The effective date of the estimate is January 30, 2020, and the cut-off date for drill data is January 20, 2020. There has been no change to the Mineral Reserve estimate at Kamoa-Kakula.

## ***Approximately eight kilometres of underground development was completed in 2019 as the project tracks towards first production in Q3 2021***

The underground development work at Kakula is being performed by mining crews operating large-capacity, semi-autonomous mining equipment, such as jumbo drilling rigs and 50-tonne trucks. A total of 7.8 kilometres of underground development was completed during 2019, which was 1.7 kilometres ahead of plan.

Mine access drives 1 and 2 (interconnected, parallel tunnels that will provide access to ore zones) continue to progress, with both access drives currently in the high-grade zone.

The number of underground mining crews has increased from six at the start of the fourth quarter, to eight working at Kakula at the end of 2019, including one owner crew. The project will continue to add additional crews over the next 12 months to further accelerate development. By the end of 2019, approximately 900 metres of development had been completed at the southern ventilation decline, which will facilitate the acceleration of critical early mine development.

### ***Engineering, procurement and construction advancing well***

Project engineering and procurement activities are advancing well. The current primary construction focus that runs through the project's critical path is the installation of the underground rock handling system, the processing plant and the electrical high-voltage infrastructure installation.

Construction progress on the underground rock handling system is progressing well with an expected commissioning date of early April 2020. The reaming of Ventilation Shaft 2 is underway and once complete, the raise bore machine will be moved to Ventilation Shaft 3. Ventilation Shaft 1 was fully commissioned earlier in 2019.

The plant earthworks is complete and civil construction is underway. Initial civil construction has prioritized the run of mine stockpile, the high pressure grinding roll stockpile and mill foundation, and concrete is in the process of being poured in these areas. The process plant long lead items will start to arrive on site from April 2020, with the mills scheduled for arrival in June 2020.

The Kamoa-Kakula Project sources a number of infrastructure items and equipment from Chinese based companies, whose operations have been impacted by the COVID-19 virus (Novel Coronavirus), and which has and can continue to be expected to, result in delays in obtaining such equipment for the continuing development of the project.

The contract for the 220 kilovolt overhead power line, as well as the contract for the new electrical substation, has been awarded. Bush clearing for the overhead line has started and earthworks for the electrical substation is underway.

Construction of the new road linking Kamoa-Kakula with the Kolwezi airport is operational with only minor items outstanding. The bulk of the accommodation at the Kakula village is complete and occupied, while the kitchen, mess area and laundry still is being constructed.



**Photo: A Kamoja transport bus, used for carrying Kamoja-Kakula employees to the mine site from the city of Kolwezi, along a recently-completed section of the permanent new highway linking the Kakula Mine with the Kolwezi airport.**



**Photo: Housing units are being constructed at Kamoja-Kakula to provide on-site accommodations for employees and contractors.**





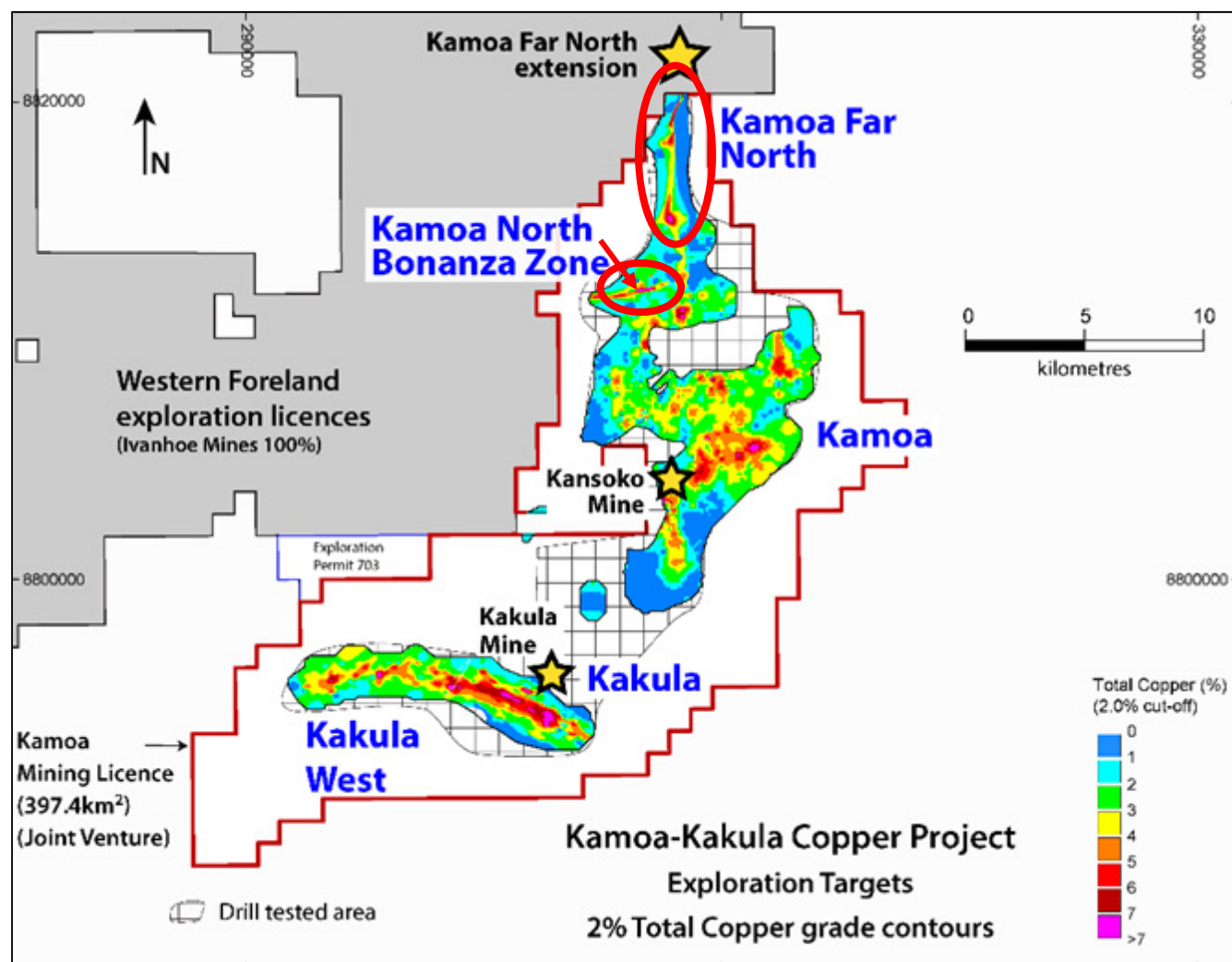
## Exploration success leads to discovery of shallow thick ultra-high grade Kamoa North Bonanza Zone

Most of the drilling in 2019 focused on the extension and definition of the Kamoa North Bonanza Zone, however some holes were drilled to target the typical K1.1.1 mineralized horizon and the Far North trend. In total, 51,187 metres were completed in 182 holes, of which 6,453 metres were completed in Q4 2019.

Ultra-high-grade mineralization previously identified over an approximately 350 metre strike length, and an implied 2.7 km potential, was further defined on 50-metre east-west spaced sections at 20-metre to 25-metre spaced centres, approximately 300 metres east and west of the discovery hole DD1450 (13.05% copper over 22.3 metres (true thickness)).

Beyond the central core of the Bonanza Zone, drilling was done on wider 100-metre spaced section lines to fully define the limits of the system. This drilling constrains the shallow portion of the Central Bonanza Zone, however the zone remains untested along considerable strike length on the western side of the West Scarp Fault.

**Figure 2: On February 6, 2020, Ivanhoe announced an updated Mineral Resource estimate for the extensive Kamoa deposit, including the recent high-grade discoveries at the Kamoa North Bonanza Zone and Kamoa Far North (circled in red).**

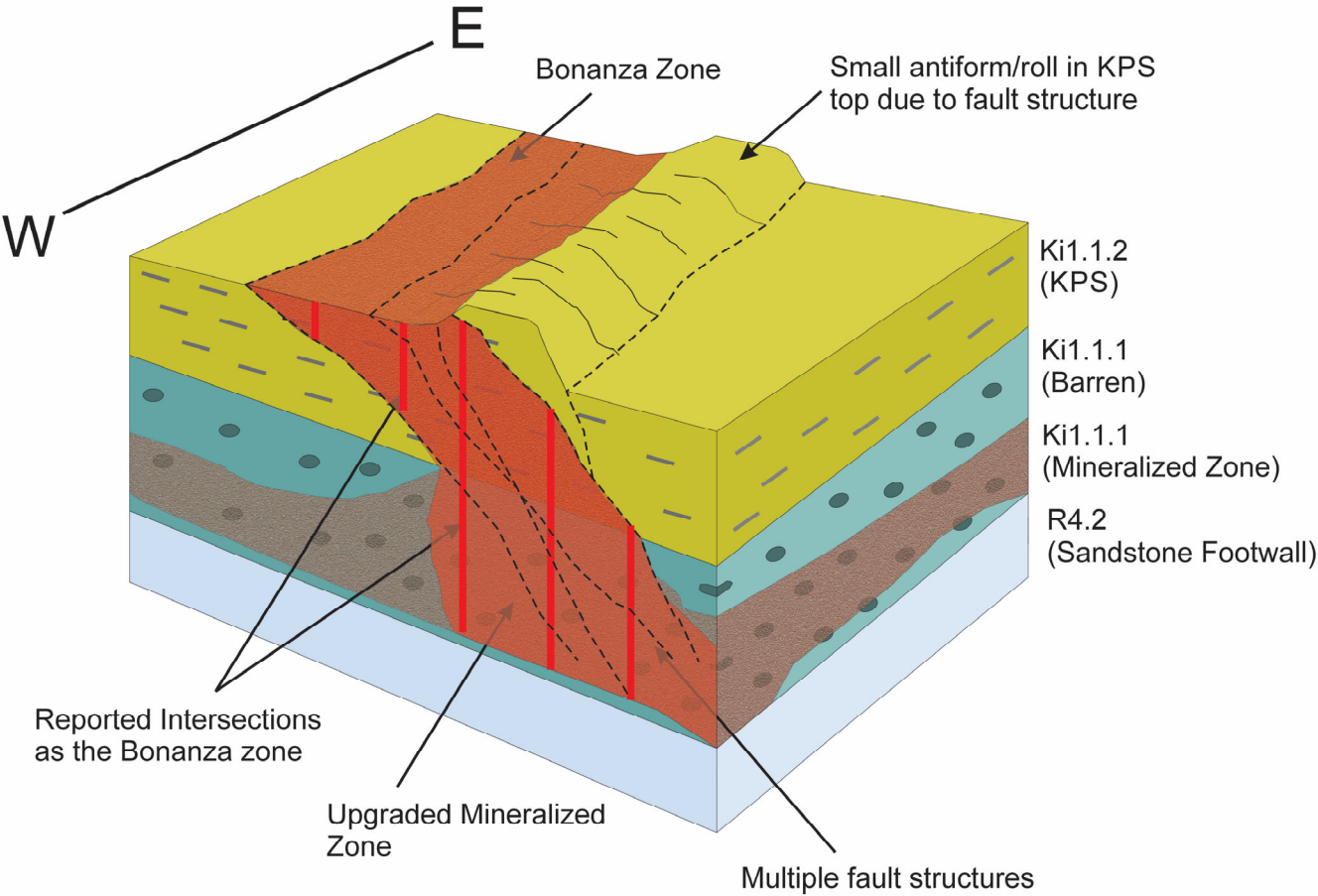


Assay results of holes from the Kamoa North Bonanza Zone were included in the updated Mineral Resource estimate announced on February 5, 2020.

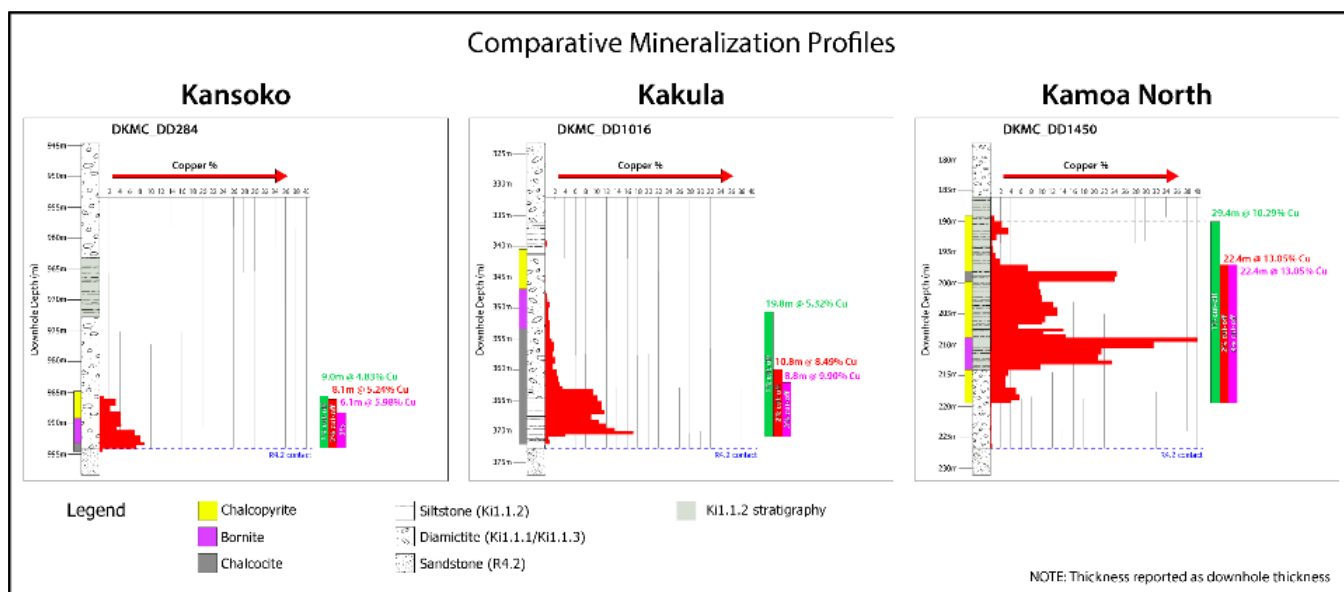
Several geophysical studies such as ground gravity, ground magnetics and “Excalibur” airborne were conducted in the Kamoa North area to better understand the controls of the ultra-high-grade mineralization which is hoped will assist in locating additional targets. Additional geological studies are planned for 2020. Packer testing has been completed in the Kamoa North Bonanza Zone and the report is expected in Q1 2020.

In the Kakula area, 2,362 metres were completed in five holes to test the extension of the Kakula West Deposit.

**Figure 3: Conceptual model of the Bonanza Zone.**



**Figure 4: Grade profiles plotted on the same scale show the significance of the grades between the different discovery areas on the Kamo-Kakula Project.**



### ***Development options at Kamo North being considered***

Given the shallow depth, remarkable thickness and massive copper sulphide mineralization discovered within the Kamo North Bonanza Zone, Kamo-Kakula's engineers are evaluating potential options to accelerate the development of this new discovery.

Geotechnical and hydrogeological drilling to provide support for future mining studies has been completed and resource modelling and mine planning are underway. A number of metallurgical composites also have been generated for existing coarse reject material that will be used for flotation test work.

### ***Ongoing upgrading work enables Mwadingusha hydropower station to supply clean electricity to the national grid***

Ongoing upgrading work at the Mwadingusha hydropower plant in the DRC has significantly progressed with major equipment being delivered to site. The power station was shut down to replace sections of penstocks that were found to be in an advanced stage of corrosion. The progressive re-commissioning of the turbines, fully refurbished and modernized with state-of-the-art control and instrumentation, is underway and is expected to be completed in Q3 2020. The refurbished plant is projected to deliver approximately 72 megawatts (MW) of power to the national power grid.

The work at Mwadingusha, part of a program to eventually overhaul and boost output from three hydropower plants, is being conducted by engineering firm Stucky of Lausanne, Switzerland, under the direction of Ivanhoe Mines and Zijin Mining, in conjunction with the DRC's state-owned power company, La Société Nationale d'Electricité (SNEL).

The Kansoko Mine, Kakula Mine and Kamo camp have been connected to the national hydroelectric power grid since the completion of a 12-kilometre, 120-kilovolt, dual-circuit power line between Kansoko and Kakula in December 2017. The design of permanent, 11-kilovolt reticulation to the ventilation shafts and mine has started, which includes substations, overhead lines and surface cables.



**Photo: Aerial view of the Mwadingusha hydropower dam in the DRC that Ivanhoe and Zijin are upgrading in a private-public partnership venture with the DRC's state-owned power company, La Société Nationale d'Electricité, to provide long-term, environmentally-friendly electricity for the Kamoakakula and Kipushi mines and the Congolese people.**



**Photo: Delivering new penstocks that will deliver water from the dam to the new turbines at the Mwadingusha hydropower plant.**





**Photo: Assembling one of the six new turbines at the Mwadingusha hydropower plant. The upgrading program is restoring the plant to its installed output capacity of approximately 72 megawatts of clean, sustainable electricity.**



### ***Continued focus on enriching communities and sustainable development***

The Kamoia-Kakula Sustainable Livelihoods Program is committed to sustainable development in the communities within the project's footprint. The main objective of the livelihoods program is to enhance food security and living standards of the people who reside within the project's footprint. The program consists primarily of fish farming, poultry production, beekeeping and food crops, including farming of maize (corn), vegetables and bananas. With the increase in development activities at the project, a significant number of employment opportunities have also been made available to residents of the local communities.

The Sustainable Livelihoods Program started in 2010 in an effort to strengthen food security and farming capacity in the host communities near Kamoia-Kakula through establishing an agricultural training garden and support for farmers at community level. Today, approximately 350 local "farmers" are benefiting from the Sustainable Livelihoods Program, producing high-quality food for their families and selling the surplus for additional income.

Additional non-farming related activities for 2019 included education and literacy programs, the continuation of a community brick-making program, the construction of a school, the construction of housing for teachers and the supply of fresh water to a number of local communities using solar powered boreholes. Community members also have been trained by community health experts to maintain the sanitation of the water boreholes in their communities.



The second and third phases of the relocation program are underway. The entire Kakula mine area, including the tailings dam, will be secured once these relocation phases are complete.

**Photo: Women from the small village of Lwansenga near Kamo-Kakula proudly show off their chickens and eggs. As part of Kamo-Kakula's Sustainable Livelihood Project, the women sell their products to the Kamo-Kakula camp kitchen.**



**Photo: Mushiya Kalonji Huguette, an environmental laboratory technical trainee at Kamo-Kakula, takes a water sample from newly-installed fresh water taps in the local village of Israel. Supplying clean, fresh drinking water to people living in the small, rural villages near Kamo-Kakula is a key part of the project's Sustainable Livelihoods Program.**



## DRC WESTERN FORELAND EXPLORATION PROJECT

Ivanhoe's DRC exploration group is targeting Kamoa-Kakula-style copper mineralization through a regional drilling program on its 100%-owned Western Foreland exploration licences, located to the north and west of the Kamoa-Kakula Project.

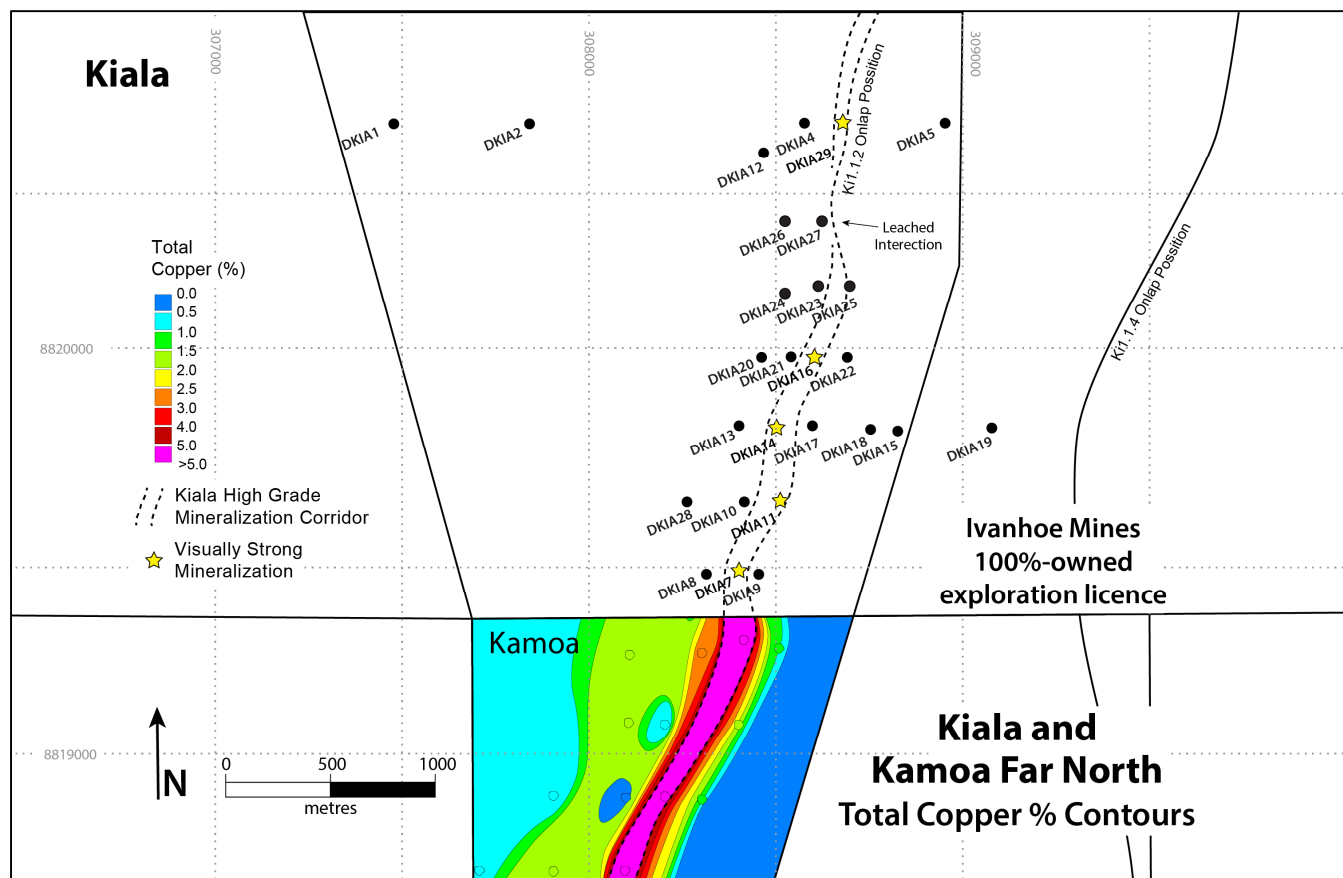
A high resolution airborne magnetic survey was completed in Q2 2019 over the Makoko and Kiala prospects, as well as over Ivanhoe's Lufupa South East Tenements. The survey was used extensively to assist with planning of the drilling in the second half of 2019.

### Exploration drilling

A total of 23,752 metres of diamond drilling was completed during 2019 in 96 drill holes over all the licences.

Drilling continued to follow up the extension of the Kamoa Far North high-grade trend on the Kiala licence, PR706, located north of the northern border of the Kamoa-Kakula mining licence. Eleven drill holes and 4,154 metres were completed during Q4 2019 at Kiala, bringing the total to 24 drill holes and 9,072 metres for 2019. The drilling and grade contour plan is shown in Figure 5 below. Drilling is currently on hold in this area due to limited access during the peak of the rainy season.

**Figure 5: Location of 2019 drilling in the Kiala and Kamoa Far North exploration area.**



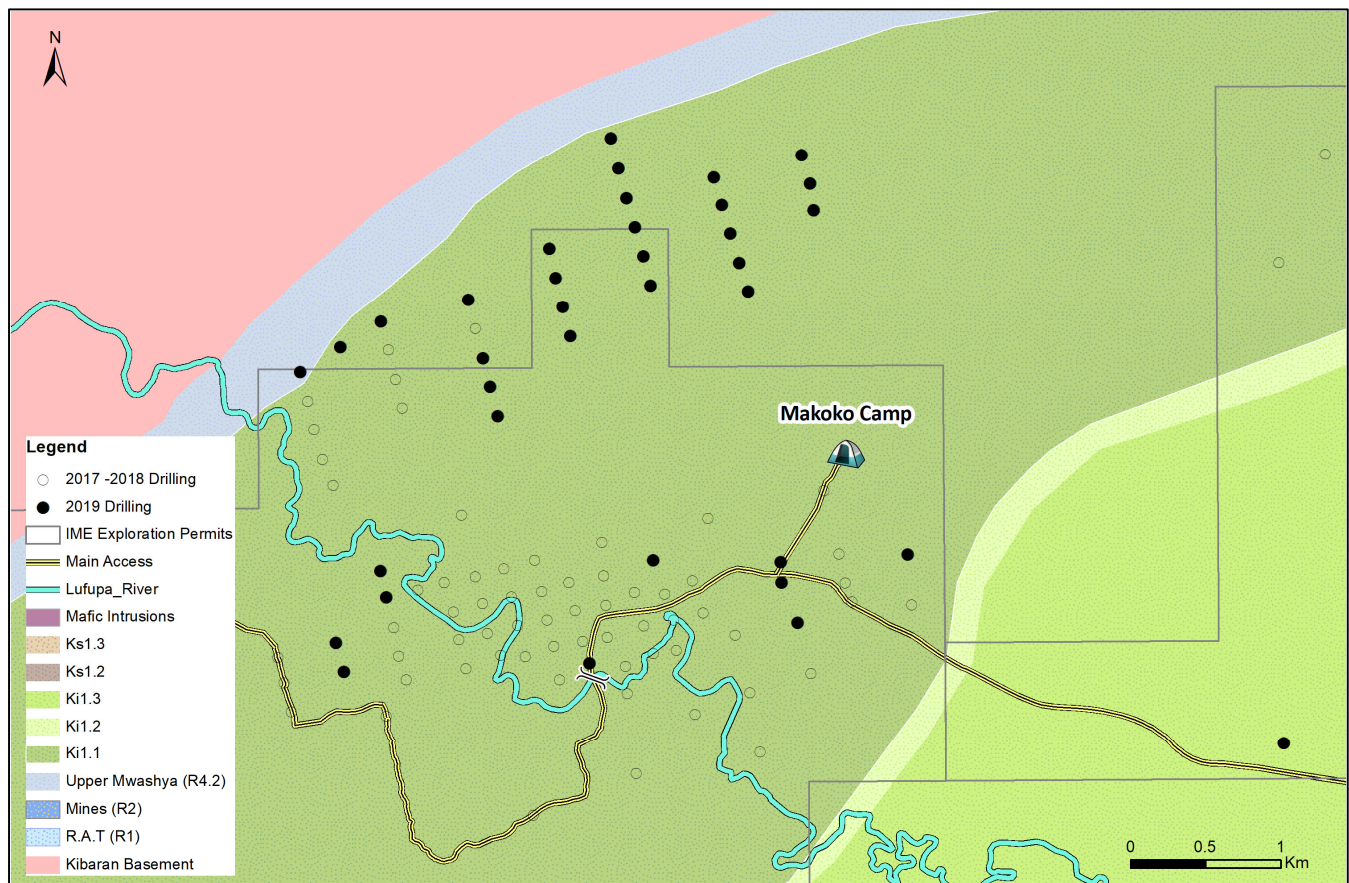
The 2019 program at Lufupa South East (LSE) aimed to drill test all outstanding steam- and soil-targets and anomalies, and confirm the existence or lack of existence of economic mineralization. If mineralization was confirmed, the plan was to fast track follow up drilling and work required for conversion to an Exploitation Permit. The fieldwork was aided significantly by the collection of high-resolution



“Xcalibur” airborne magnetic data over all the prospects, as well as airborne Electro-Magnetics (EM) over Musinga and ground gravity over Kengere. A total of 31 diamond drill holes have been drilled for a total of 3,011 metres in the LSE area using Land Cruiser rigs, and 2,089 metres at Kengere, for a total of 5,100 metres. No additional significant mineralization was discovered.

No drilling was completed on the Makoko Sud licence in Q4 2019, with exploration focusing on acquiring detailed ground gravity data to assist the 2020 drill targeting. A total of 12 deep drill holes (6,391 metres) as well as 25 sub outcrop drill holes (3,188 metres) using the Company owned Land Cruiser mounted rigs were completed earlier in 2019. Resource, as well as metallurgical and geotechnical drilling was carried out in the first half of the year, and then the focus shifted to the subcrop drilling during the second half of the year. The drilling is shown in Figure 6 below.

**Figure 6: 2019 Makoko Sud drilling**



## SELECTED ANNUAL FINANCIAL INFORMATION

This selected financial information is in accordance with IFRS as presented in the annual consolidated financial statements. Ivanhoe had no operating revenue in any financial reporting period and did not declare or pay any dividend or distribution in any financial reporting period.

	For the year ended December 31,		
	2019	2018	2017
	\$'000	\$'000	\$'000
Exploration and project expenditure	11,619	11,487	40,503
Share of loss (profit) from joint venture	24,821	(19,615)	27,505
General administrative expenditure	16,464	26,215	19,260
Share-based payments	10,322	6,871	4,908
Loss (gain) on fair valuation of financial asset	784	6,639	(5,843)
Reversal of impairment of mineral property and other items	-	-	(286,283)
Finance income	(72,395)	(49,859)	(32,614)
Finance costs	299	946	1,710
Total comprehensive (income) loss attributable to:			
Owners of the Company	(27,211)	3,892	(182,872)
Non-controlling interest	7,022	9,703	(64,909)
Basic profit per share	(0.02)	(0.03)	(0.22)
Diluted profit per share	(0.02)	(0.03)	(0.21)
Total assets	2,444,722	1,884,788	1,271,311
Non-current liabilities	49,716	36,189	33,668

## DISCUSSION OF RESULTS OF OPERATIONS

### *Review of the year ended December 31, 2019 vs. December 31, 2018*

The Company recorded total comprehensive income of \$20.2 million for the year ended December 31, 2019, compared to a total comprehensive loss of \$13.6 million for the year ended December 31, 2018. The main reason for the loss for the year ended December 31, 2018, was the exchange loss on translation of foreign operations of \$33.0 million, resulting from the weakening of the South African Rand by 17% from December 31, 2017, to December 31, 2018, compared to an exchange gain on translation of foreign operations recognized in 2019 of \$8.8 million.

The Company recognized a foreign exchange gain of \$14.9 million for the year ended December 31, 2019, compared to a foreign exchange loss of \$1.1 million for the same period for 2018. The gain in 2019 resulted from the Company converting the majority of its Canadian Dollar bank balance, as well as the proceeds received from the private placement completed in August 2019, to U.S. dollars at favourable exchange rates. Of the Company's \$702.8 million cash and cash equivalents as at December 31, 2019, an equivalent of \$41.4 million remained denominated in Canadian Dollar.

Finance income for the year ended December 31, 2019 amounted to \$72.4 million, and was \$22.5 million more than for the same period in 2018 (\$49.9 million). The increase mainly was due to interest earned

on loans to the Kamoia Holding joint venture to fund operations that amounted to \$53.5 million in 2019, and increased by \$13.1 million when compared to 2018 as the accumulated loan balance increased. Interest received on cash and cash equivalents also increased from \$7.1 million for the year ended December 31, 2018 to \$13.6 million for the same period in 2019 due to a higher cash balance in 2019.

Exploration and project expenditure amounted to \$11.6 million in 2019 and \$11.5 million in 2018 and related to exploration at Ivanhoe's 100%-owned Western Foreland exploration licences.

The Company's share of losses from the Kamoia Holding joint venture was \$24.8 million for the year ended December 31, 2019, compared to a profit of \$19.6 million for the same period in 2018, the breakdown of which is summarized in the following table:

	<b>Year ended December 31, 2019</b>	<b>Year ended December 31, 2018</b>
	<b>\$'000</b>	<b>\$'000</b>
Finance costs	70,196	57,083
Exploration expenses	10,265	19,921
Foreign exchange losses	345	168
Finance income	(5,631)	(3,742)
Reversal of VAT impairment	-	(15,557)
Loss before taxes	75,175	57,873
Deferred tax recovery	(17,068)	(110,416)
Loss (profit) after taxes	58,107	(52,543)
Non-controlling interest of Kamoia Holding	(7,965)	12,917
Loss (profit) for the year attributable to joint venture partners	50,142	(39,626)
Company's share of loss (profit) from joint venture (49.5%)	24,821	(19,615)

In 2018, the Kamoia Holding joint venture recognized a deferred tax asset due to future taxable income being deemed probable at the Kamoia-Kakula Project. Furthermore, with revenue deemed probable, the Kamoia Holding joint venture also had reversed the impairment of previously impaired VAT receivables that will be available for set-off once income tax is payable. The costs associated with mine development are capitalized as development costs in Kamoia Holding, while the exploration expenditure is expensed.

The interest expense in the Kamoia Holding joint venture relates to shareholder loans where each shareholder is required to fund Kamoia Holding in an amount equivalent to its proportionate shareholding interest. The Company is advancing Crystal River's portion on its behalf in return for an increase in the promissory note due to Ivanhoe.

#### *Financial position as at December 31, 2019 vs. December 31, 2018*

The Company's total assets increased by \$559.9 million, from \$1,884.8 million as at December 31, 2018, to \$2,444.7 million as at December 31, 2019. The increase mainly was due to the proceeds received on completion of the second equity investment by CITIC Metal Africa Investments Limited (CITIC Metal Africa) and Zijin exercising its anti-dilution rights, for total proceeds of \$509 million.

Cash and cash equivalents increased by \$128.8 million to \$702.8 million as at December 31, 2019, from \$574.0 million as at December 31, 2018. The Company utilized \$26.4 million of its cash resources in its operations and received interest of \$13.6 million during the year ended December 31, 2019.

The net increase of property, plant and equipment amounted to \$126.2 million, with a total of \$120.5 million being spent on project development and to acquire other property, plant and equipment. Of this total, \$50.4 million and \$68.1 million pertained to development costs and other acquisitions of property, plant and equipment at the Platreef Project and Kipushi Project respectively.

The main components of the additions to property, plant and equipment – including capitalized development costs – at the Platreef and Kipushi projects for the year ended December 31, 2019, and for the same period in 2018, are set out in the following table:

	Year ended December 31, 2019 \$'000	Year ended December 31, 2018 \$'000
<b>Platreef Project</b>		
Shaft 1 construction	28,810	29,856
Salaries and benefits	8,533	9,077
Administrative and other expenditure	4,305	7,515
Shaft 2 early works	3,263	5,438
Social and environmental	2,328	2,331
Studies and contracting work	1,351	1,885
Site costs	1,007	1,114
Infrastructure	113	2,233
Total development costs	49,710	59,449
Other additions to property, plant and equipment	645	476
Total additions to property, plant and equipment for Platreef	50,355	59,925
<b>Kipushi Project</b>		
Infrastructure, equipment and refurbishment	19,380	21,488
Salaries and benefits	17,907	16,174
Studies and contracting work	6,594	6,762
Electricity	6,166	7,008
Depreciation	4,938	3,005
Other expenditure	11,444	13,647
Total development costs, infrastructure and equipment	66,429	68,084
Other additions to property, plant and equipment	1,644	1,001
Total additions to property, plant and equipment for Kipushi	68,073	69,085

Costs incurred at the Platreef and Kipushi projects are deemed necessary to bring the projects to commercial production and are therefore capitalized as property, plant and equipment.

The Company's investment in the Kamoa Holding joint venture increased by \$230.9 million from \$681.7 million as at December 31, 2018, to \$912.6 million as at December 31, 2019, with each of the current shareholders funding the operations equivalent to their proportionate shareholding interest. The Company's portion of the Kamoa Holding joint venture cash calls amounted to \$202.3 million during the year ending December 31, 2019, while the Company's share of losses from the joint venture amounted to \$24.8 million.

The Company's investment in the Kamoa Holding joint venture can be broken down as follows:

	December 31, 2019	December 31, 2018
	\$'000	\$'000
Company's share of net assets in joint venture	177,319	202,140
Loan advanced to joint venture	735,317	479,521
Total investment in joint venture	912,636	681,661

The Kamoa Holding joint venture principally uses loans advanced to it by its shareholders to advance the Kamoa-Kakula Project through investing in development costs and other property, plant and equipment, as well as continuing with exploration. This can be evidenced by the movement in the Company's share of net assets in the Kamoa Holding joint venture which can be broken down as follows:

	December 31, 2019		December 31, 2018	
	100%	49.5%	100%	49.5%
	\$'000	\$'000	\$'000	\$'000
<b>Assets</b>				
Mineral property	802,021	397,000	802,021	397,000
Property, plant and equipment	727,391	360,059	423,183	209,476
Deferred tax asset	127,484	63,105	110,416	54,656
Long term loan receivable	126,012	62,376	87,775	43,449
Prepaid expenses	77,844	38,533	9,104	4,507
Cash and cash equivalents	73,968	36,614	34,916	17,283
Indirect taxes receivable	47,233	23,380	30,427	15,061
Right-of-use asset	30,128	14,913	-	-
Non-current inventory	9,188	4,548	-	-
Consumable stores	8,987	4,449	5,302	2,624
Non-current deposits	1,289	638	385	191
<b>Liabilities</b>				
Shareholder loans	(1,484,737)	(734,945)	(968,173)	(479,246)
Trade and other payables	(54,005)	(26,733)	(17,990)	(8,905)
Lease liability	(30,211)	(14,954)	-	-
Rehabilitation provision	(5,727)	(2,835)	(2,394)	(1,185)
Non-controlling interest	(98,644)	(48,829)	(106,609)	(52,771)
<b>Net assets of the joint venture</b>	<b>358,221</b>	<b>177,319</b>	<b>408,363</b>	<b>202,140</b>

The Kamoa Holding joint venture's net increase in property, plant and equipment from December 31, 2018, to December 31, 2019, amounted to \$304.2 million and can be further broken down as follows:

	Year ended December 31, 2019 \$'000	Year ended December 31, 2018 \$'000
<b>Kamoa Holding joint venture</b>		
Kakula decline and mine development	125,179	34,787
Borrowing costs capitalized	37,751	24,442
Studies and contracting work	30,948	10,292
Salaries and benefits	28,321	15,075
Camp and office construction	16,630	1,466
Roads	12,858	-
Office and administrative expenditure	10,784	6,249
Site costs, security and safety	8,208	4,620
Project fleet	3,802	530
Other development costs	14,863	9,238
Total development costs	289,344	106,699
Other additions to property, plant and equipment	19,401	2,961
Total additions to property, plant and equipment for Kamoa Holding	308,745	109,660
Less depreciation and disposals	(4,539)	(3,657)
Net increase in property, plant and equipment of Kamoa Holding	304,206	106,003

The Company extended a secured loan of \$50 million to High Power Exploration Inc. (HPX), a subsidiary of I-Pulse Inc., in April 2019. The loan has a two-year maturity and an interest rate of 8% per annum. The principal amount of the loan and accrued interest is convertible in whole, or part, by Ivanhoe at its sole discretion into shares of treasury common stock of HPX and/or a subsidiary of HPX. The loan is secured by a pledge of shares of an HPX subsidiary in the United States which is pursuing a Tier One copper-gold exploration and development project.

On adoption of IFRS 16 on January 1, 2019, the Company recognized a right-of-use asset of \$15.2 million and a lease liability of \$15.2 million. The Company's total liabilities increased by \$15.9 million to \$81.9 million as at December 31, 2019, from \$66.0 million as at December 31, 2018, with the recognition of the lease liability being the main reason for the increase.

## SELECTED QUARTERLY FINANCIAL INFORMATION

The following table summarizes selected financial information for the prior eight quarters. Ivanhoe had no operating revenue in any financial reporting period and did not declare or pay any dividend or distribution in any financial reporting period.

	Three months ended			
	December 31,	September 30,	June 30,	March 31,
	2019	2019	2019	2019
	\$'000	\$'000	\$'000	\$'000
Exploration and project expenditure	3,664	3,266	3,290	1,399
Share of loss from joint venture	5,610	7,084	6,248	5,879
General administrative expenditure	5,642	4,985	3,730	2,107
Share-based payments	3,320	2,744	2,239	2,019
Finance income	(20,761)	(18,920)	(16,859)	(15,855)
Finance costs	76	71	56	96
Total comprehensive (income) loss attributable to:				
Owners of the Company	(25,182)	13,077	(9,570)	(5,536)
Non-controlling interest	(317)	3,718	1,441	2,180
Basic profit per share	(0.01)	(0.00)	(0.00)	(0.01)
Diluted profit per share	(0.01)	(0.00)	(0.00)	(0.01)

	Three months ended			
	December 31,	September 30,	June 30,	March 31,
	2018	2018	2018	2018
	\$'000	\$'000	\$'000	\$'000
Exploration and project expenditure	4,910	2,368	2,773	1,436
Share of (profit) loss from joint venture	(41,274)	7,757	6,702	7,200
General administrative expenditure	12,869	1,823	6,269	5,254
Share-based payments	1,866	1,829	1,764	1,412
Finance income	(16,481)	(12,146)	(10,875)	(10,357)
Finance costs	66	185	352	343
Total comprehensive (income) loss attributable to:				
Owners of the Company	(30,740)	5,838	33,710	(4,916)
Non-controlling interest	2,330	2,046	4,263	1,064
Basic (profit) loss per share	(0.04)	0.00	0.01	0.01
Diluted (profit) loss per share	(0.04)	0.00	0.01	0.01

*Review of the three months ended December 31, 2019 vs. December 31, 2018*

The Company recorded total comprehensive income of \$25.5 million for Q4 2019 compared to \$28.4 million for the same period in 2018. The majority of the income in Q4 2019 mainly was due to an exchange gain on translation of foreign operations of \$20.7 million resulting from the strengthening of the South African Rand from September 30, 2019, to December 31, 2019. The Company recognized an exchange loss on translation of foreign operations in Q4 2018 of \$9.1 million.

Finance income for Q4 2019 amounted to \$20.8 million, and was \$4.3 million more than for the same period in 2018 (\$16.5 million). The increase mainly was due to interest earned on loans to the Kamoia Holding joint venture to fund operations as the accumulated loan balance increased. This interest amounted to \$15.1 million for Q4 2019, and \$11.6 million for the same period in 2018.

Exploration and project expenditure for Q4 2019 amounted to \$3.7 million and was \$1.2 million less than for the same period in 2018 (\$4.9 million). With the focus at the Kipushi and Platreef projects being on development and the Kamoia-Kakula Project being accounted for as a joint venture, all exploration and project expenditure in both periods related to exploration at Ivanhoe's 100%-owned Western Foreland exploration licences.

The Company's share of losses from the Kamoia Holding joint venture was \$5.6 million for the three months ended December 31, 2019, compared to a profit of \$41.3 million for the same period in 2018, the breakdown of which is summarized in the following table:

	<b>Three months ended December 31,</b>	
	<b>2019</b>	<b>2018</b>
	<b>\$'000</b>	<b>\$'000</b>
Finance costs	19,067	16,155
Exploration expenses	(2,114)	5,618
Foreign exchange losses	131	145
Reversal of VAT impairment	-	(15,557)
Finance income	(1,714)	(1,145)
Loss before taxes	15,370	5,216
Deferred tax recovery	(2,753)	(110,416)
Loss (profit) after taxes	12,617	(105,200)
Non-controlling interest of Kamoia Holding	(1,285)	21,818
Loss (profit) for the period attributable to joint venture partners	11,332	(83,382)
Company's share of loss (profit) from joint venture (49.5%)	5,609	(41,274)

It is evident from the above table that the profit in 2018 was due to the recognition of the previously unrecognized deferred tax asset in Kamoia Holding, as well as the reversal of the impairment of previously impaired VAT receivables.



## LIQUIDITY AND CAPITAL RESOURCES

The Company had \$702.8 million in cash and cash equivalents as at December 31, 2019. At this date, the Company had consolidated working capital of approximately \$688.5 million, compared to \$562.9 million at December 31, 2018.

The private placement transaction with CITIC Metal Africa, a direct subsidiary of CITIC Metal Co., Ltd. (CITIC Metal), announced on April 25, 2019, was completed on August 16, 2019. The Company received gross proceeds of C\$612 million (\$459 million) from CITIC Metal Africa and issued 153,821,507 common shares to CITIC Metal Africa through the private placement at a price of C\$3.98 per share. Zijin Mining exercised its existing anti-dilution rights, which yielded additional proceeds to the Company of C\$67 million (\$50 million), also at a price of C\$3.98 per share.

Since December 8, 2015, each shareholder in Kamo Holding has been required to fund Kamo Holding in an amount equivalent to its proportionate shareholding interest. The Company is advancing Crystal River's portion on its behalf in return for an increase in the promissory note due to Ivanhoe.

The Platreef Project's current expenditure is being funded solely by Ivanhoe, through an interest bearing loan to Ivanplats, as the Japanese consortium has elected not to contribute to current expenditures.

The Company's main objective for 2020 at the Platreef Project is the continuation of Shaft 1 construction and study work on the phased development production plan. At Kipushi, the principal objectives are the completion of the feasibility study and upgrading of certain mining infrastructure. At the Kamo-Kakula Project, priorities are the continuation of development at Kakula where initial copper concentrate production from the Kakula Mine is currently scheduled for the third quarter of 2021. The Company has budgeted to spend \$60 million on further development at the Platreef Project; \$40 million at the Kipushi Project; \$16 million on regional exploration in the DRC; and \$30 million on corporate overheads for 2020 – as well as its proportionate funding of the Kamo-Kakula Project, expected to be \$400 million for 2020.

As Ivanhoe continues to advance its projects, representatives of Ivanhoe have reviewed and assessed numerous alternatives to finance its share of construction costs for the Kamo-Kakula Copper Mine and to advance exploration and development initiatives at its other projects in Southern Africa. These alternatives include, but are not limited to, existing liquidity sources, including cash, receivables and investments, selling assets, project financing, streaming or royalty transactions, equipment financing, and accessing lines of credit. While Ivanhoe expects that it will continue to have sufficient cash resources or project-related financing options available to cover its share of the initial capital costs at the Kamo-Kakula Mine, the Company will continue to seek out and review opportunities presented to Ivanhoe, having regard to the best interests of Ivanhoe as well as to Ivanhoe's operations and financial position, industry conditions and geopolitical considerations.

The Company has a mortgage bond outstanding on its offices in London, United Kingdom, of £3.2 million (\$4.2 million). The bond is fully repayable on August 31, 2020, secured by the property and incurs interest at a rate of GBP 1-month LIBOR plus 1.9% payable monthly in arrears. Only interest will be payable until maturity.

In 2013, the Company became party to a loan payable to ITC Platinum Development Limited, which had a carrying value of \$29.7 million as at December 31, 2019, and a contractual amount due of \$33.8 million. The loan is repayable once the Platreef Project has residual cashflow, which is defined in the loan agreement as gross revenue generated by the Platreef Project, less all operating costs attributable thereto, including all mining development and operating costs. The loan attracts interest of USD 3 month LIBOR plus 2% calculated monthly in arrears. Interest is not compounded. The difference of \$4.1 million between the contractual amount due and the carrying value of the loan is the benefit derived from the low-interest loan.

The Company has an implied commitment in terms of spending on work programs submitted to regulatory bodies to maintain the good standing of exploration and exploitation permits at its mineral properties. The following table sets forth the Company's long-term obligations:

	Payments Due By Period				
	Total	Less than 1 year	1-3 years	4-5 years	After 5 years
<b>Contractual obligations as at December 31, 2019</b>	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>
Debt	37,997	-	4,230	-	33,767
Lease commitments	815	506	309	-	-
Shaft 1 construction – Platreef Project	12,964	12,964	-	-	-
<b>Total contractual obligations</b>	<b>51,776</b>	<b>13,470</b>	<b>4,539</b>	<b>-</b>	<b>33,767</b>

Debt in the above table represents the mortgage bond owing to Citibank and loan payable to ITC Platinum Development Limited, as described above.

The Company is required to fund its Kamoia Holding joint venture in an amount equivalent to its proportionate shareholding interest.

#### **OFF-BALANCE SHEET ARRANGEMENTS**

The Company had no off-balance sheet arrangements for the periods under review.

## TRANSACTIONS WITH RELATED PARTIES

The following tables summarize related party income earned and expenses incurred by the Company, primarily on a cost-recovery basis, with companies related by way of directors or significant shareholders in common. The tables summarize the transactions with related parties and the types of income earned and expenditures incurred with related parties:

	Year ended December 31, 2019 \$'000	Year ended December 31, 2018 \$'000
Global Mining Management Corporation (a)	4,302	3,926
Ivanhoe Capital Aviation LLC (b)	3,500	2,457
HCF International Advisers (c)	1,020	838
GMM Tech Holdings Inc. (d)	679	996
Ivanhoe Capital Services Ltd. (e)	499	481
Ivanhoe Capital Pte Ltd (f)	181	335
Global Mining Services Ltd. (g)	59	22
Ivanhoe Capital Corporation (UK) Limited (h)	25	8
Kamoa Holding Limited (i)	(53,524)	(40,378)
Kamoa Copper SA (j)	(7,883)	(4,304)
High Power Exploration Inc.(k)	(2,899)	-
Ivanhoe Mines Energy DRC Sarl (l)	(291)	(363)
	(54,332)	(35,982)
Salaries and benefits	4,392	3,244
Travel	3,776	2,925
Consulting	1,656	2,657
Office and administration	296	237
Finance income	(56,278)	(40,378)
Cost recovery and management fee	(8,174)	(4,667)
	(54,332)	(35,982)

The above noted transactions were in the normal course of operations and were measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

As at December 31, 2019, trade and other payables included \$0.6 million (December 31, 2018: \$1.2 million) with regards to amounts due to related parties related by way of director or officers in common. These amounts are unsecured and non-interest bearing. Included in other receivables is \$3.9 million (December 31, 2018: \$1.8 million) due from parties related by way of directors, officers or shareholders in common.

- (a) Global Mining Management Corporation (Global) is a private company based in Vancouver, Canada. The Company and the Executive Co-Chairman of the Company hold an indirect equity interest in Global. Global provides administration, accounting and other services to the Company on a cost-recovery basis.

- (b) Ivanhoe Capital Aviation LLC (Aviation) is a private company owned indirectly by the Executive Co-Chairman of the Company. Aviation operates an aircraft for which the Company contributes toward the running costs.
- (c) HCF International Advisers (HCF) is a corporate finance adviser specializing in the provision of advisory services to clients worldwide in the metals, mining, steel and related industries. Guy de Selliers, a director of Ivanhoe, is the President and co-founder of HCF, which provides financial advisory services to the Company.
- (d) GMM Tech Holdings Inc. (GMM Tech) is a private company incorporated in British Columbia, Canada and is 100% owned by Global. GMM Tech provides information technology services to the Company on a cost-recovery basis.
- (e) Ivanhoe Capital Services Ltd. (Services) is a private company owned indirectly by the Executive Co-Chairman of the Company. Services provides for salaries administration and other services to the Company in Singapore and Beijing on a cost-recovery basis.
- (f) Ivanhoe Capital Pte. Ltd. (Capital) is a private company owned indirectly by the Executive Co-Chairman of the Company. Capital provides administration, accounting and other services in Singapore on a cost-recovery basis.
- (g) Global Mining Services Ltd. (GMS) is a private company incorporated in Delaware and is 100% owned by Global. GMS provides administration and other services to the Company on a cost-recovery basis.
- (h) Ivanhoe Capital Corporation (UK) Limited (ICC) is a private company owned indirectly by the Executive Co-Chairman of the Company. ICC provides administration, accounting and other services in London on a cost-recovery basis.
- (i) Kamoa Holding Limited is a company registered in Barbados. The Company has an effective 49.5% ownership in Kamoa Holding. The Company earns interest on the loans advanced to Kamoa Holding.
- (j) Kamoa Copper SA (Kamoa Copper) is a company incorporated in the DRC. Kamoa Copper is 80% owned by Kamoa Holding Limited, a joint venture of the Company. The Company provides administration, accounting and other services to Kamoa Copper on a cost-recovery basis.
- (k) High Power Exploration Inc. (HPX) is a private company incorporated under the laws of Delaware, USA. The Company's Executive Co-Chairman is the Chief Executive Officer and Chairman of HPX and holds an indirect equity interest in HPX. The Company's Executive Vice Chairman is also the Vice Chairman of HPX and Ms. Mahler, a director of the Company, is also a director of HPX. The Company extended a secured loan of \$50 million to HPX. The loan receivable has a two-year maturity and earns interest at a rate of 8% per annum.
- (l) Ivanhoe Mines Energy DRC Sarl (Energy) is a company incorporated in the DRC. Energy is 100% owned by Kamoa Holding Limited, a joint venture of the Company. The Company provides administration, accounting and other services to Energy on a cost-recovery basis.

## CRITICAL ACCOUNTING ESTIMATES

The Company's significant accounting policies are presented in Note 2 to the consolidated financial statements for the year ended December 31, 2019. The preparation of the consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the end of the reporting period presented and reported amounts of expenses during said reporting period. Actual outcomes could differ from these estimates. The consolidated financial statements include estimates that, by their nature, are uncertain. Such estimates have a pervasive effect on the consolidated financial statements and may require accounting adjustments based on future occurrences. Revisions to accounting estimates are recognized in the year in which the estimate is revised and future years if the revision affects both current and future years. These estimates are based on historical experience, current and future economic conditions and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

Significant assumptions about the future and other sources of estimation uncertainty at the end of the reporting period, which could result in a material adjustment to the carrying amounts of assets and liabilities in the event that actual results differ from assumptions made, include, but are not limited to, the following:

### *Recoverability of assets*

Property, plant and equipment, including capitalized development costs and finite lived intangible assets are assessed at each reporting period to determine whether there is any indication that those assets have suffered an impairment loss.

In assessing whether an impairment is required, the carrying value of the asset or cash generating unit ("CGU") is compared with its recoverable amount. The recoverable amount is the higher of the CGU's fair value less costs of disposal and value in use. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent, if any, of the impairment loss.

The Company assesses whether an impairment is required on loan receivables. A range of cash flow scenarios are considered, taking into account forward looking information which may impact recoverability of loan receivables.

Given the nature of the Company's activities, information on the fair value of an asset is usually difficult to obtain unless negotiations with potential purchasers or similar transactions are taking place. Consequently, the fair value less costs of disposal for each CGU is estimated based on discounted future estimated cash flows that are expected to be generated from the continued use of the CGUs. They are estimated using market consensus based commodity price and exchange assumptions, estimated quantities of recoverable minerals, production levels, operating costs and capital requirements, including any expansion projects, and its eventual disposal, based on the CGU development plans and latest technical reports. These cash flows were discounted using a discount rate that reflected current market assessments of the time value of money and the risks specific to the CGU.

If the recoverable amount of an asset or CGU is estimated to be less than its carrying amount, the carrying amount of the asset or CGU is impaired to its recoverable amount. An impairment loss is recognized immediately in the statement of comprehensive income. The Company has concluded that there is no impairment required to any of its projects.

### *Technical feasibility and commercial viability of projects*

All direct costs related to the acquisition of mineral property interests are capitalized by property or project. Exploration costs are charged to operations in the period incurred, until such time as the Company determines that a property is technically feasible and commercially viable, where after

development costs are capitalized. In making this determination, the Company considers whether a proposed project is capable of being developed at a sufficient return to justify the capital and managerial resources that must be committed to the project. This determination is made on a property-by-property basis and generally coincides with the finalization of a preliminary economic assessment or pre-feasibility study of the property. Exploration costs include value-added taxes incurred in foreign jurisdictions when recoverability of those taxes is uncertain.

In determining whether an exploration and evaluation property is technically feasible and commercially viable, the Company considers several criteria, including:

- a technical analysis of the basic geology of the project;
- a mine plan for accessing and exploiting the ore body;
- a process flow sheet for processing the ore generated from mining;
- projections as to the capital cost of constructing the project;
- projections as to the cost of operating the project in accordance with the mine plan;
- projections as to revenues from the concentrate or other mineral product to be generated from operations in accordance with the mine plan; and
- an economic analysis of the project based on the projected capital and operating costs and production revenues.

#### *Determination of inputs into lease accounting*

Lease payments should be discounted using the interest rate implicit in the lease unless that rate cannot be readily determined, in which case the lessee's incremental borrowing rate is used, being the rate that the individual lessee would have to pay to borrow the funds necessary to obtain an asset of similar value to the right-of-use asset in a similar economic environment with similar terms, security and conditions. The Company has used the risk-free interest rate adjusted for credit risk specific to the lease.

In determining the lease term, the Company considers all facts and circumstances that create an economic incentive to exercise an extension option, or not exercise a termination option. Extension options (or periods after termination options) are only included in the lease term if the lease is reasonably certain to be extended (or not terminated).

## **CHANGES IN ACCOUNTING POLICIES INCLUDING INITIAL ADOPTION**

### **Newly adopted accounting standards**

The following standards became effective for annual periods beginning on or after January 1, 2019, with earlier application permitted. The Company adopted these standards in the current period.

- IFRS 9 – Financial instruments. The amendments allow companies to measure particular prepayable financial assets with so-called negative compensation at amortized cost or at fair value through other comprehensive income if a specified condition is met, instead of at fair value through profit or loss.
- IFRS 16 – Leases. IFRS 16 was issued in January 2016 and will result in almost all leases being recognized on the statement of financial position by lessees, as the distinction between operating and finance leases has been removed. An asset (the right to use the leased item) and a financial liability to pay rentals are recognized. The only exceptions are short-term and low-value leases.

The Company has adopted IFRS 16 retrospectively using the first variation of the modified retrospective approach, and has therefore not restated comparatives for the 2018 reporting period, as permitted under the specific transitional provisions in the standard.

Right-of use assets were measured at the amount equal to the lease liability at the date of initial application (January 1, 2019), adjusted by the amount of any prepaid or accrued lease payments relating to that lease.

- IAS 19, Employee benefits on plan amendment, curtailment or settlement. The amendment uses updated assumptions to determine current service cost and net interest for the remainder of the period after a plan amendment, curtailment or settlement.
- IAS 28, Investments in associates and joint ventures – long-term interests in associates and joint ventures. The amendments clarified that companies account for long-term interests in an associate or joint venture, to which the equity method is not applied, using IFRS 9.
- Amendments to IFRS 2 - Share-based payments. This amendment clarifies the measurement basis for cash-settled, share-based payments and the accounting for modifications that change an award from cash-settled to equity-settled.
- Annual improvements 2015 - 2017 Cycle: IFRS 3 – Business Combinations and IFRS 11 – Joint arrangements. The amendment clarifies that when an entity obtains joint control of a business that is a joint operation, the entity does not re-measure previously held interests in that business.
- Annual improvements 2015 - 2017 Cycle: IAS 12 – Income Taxes. The amendment clarifies that all income tax consequences of dividends should be recognized in profit or loss, regardless of how the tax arises.
- Annual Improvements 2015 - 2017 Cycle: IAS 23 – Borrowing Costs. The amendment clarifies that if any specific borrowing remains outstanding after the related asset is ready for its intended use or sale, that borrowing becomes part of the funds that an entity borrows generally when calculating the capitalization rate on general borrowings.
- IFRIC 23 – Uncertainty over income tax treatments. The interpretation specifies how an entity should reflect the effects of uncertainties in accounting for income taxes.

#### **Accounting standards issued but not yet effective**

- IFRS 3 – Business Combinations. The amendment to the definition of a business confirmed that a business must include inputs and a process and clarified that the process must be substantive and that the inputs and process must together significantly contribute to creating outputs. Furthermore, the amendment narrowed the definition of a business by focusing the definition of outputs on goods and services provided to customers and other income from ordinary activities, rather than providing dividends or other economic benefits directly to investors or lowering costs. (i)

The Company has considered the amendment and assessed that it will have no material impact on adoption.

- IAS 1 – Presentation of Financial Statements and IAS 8 - Accounting Policies, Changes in Accounting Estimates and Errors. The amendments clarify and align the definition of 'material' and provide guidance to help improve consistency in the application of that concept whenever it is used in IFRS Standards. (i)

The Company has considered the amendment and assessed that it will have no material impact on adoption.

- (i) Effective for annual periods beginning on or after January 1, 2020

The Company has not yet adopted these new and amended standards.

## FINANCIAL INSTRUMENTS AND OTHER INSTRUMENTS

### Fair value of financial instruments

The Company's financial assets and financial liabilities are categorized as follows:

	Level	December 31, 2019 \$'000	December 31, 2018 \$'000
<b>Financial assets</b>			
<i>Financial assets at fair value through profit or loss</i>			
Investment in listed entity	Level 1	1,140	1,924
Investment in unlisted entity	Level 3	655	-
<i>Amortized cost</i>			
Cash and cash equivalents		702,810	574,048
Loan advanced to joint venture	Level 3	735,317	479,521
Long term loans receivable	Level 3	91,955	36,471
Promissory note receivable	Level 3	16,799	12,713
Other receivables		8,036	5,497
<b>Financial liabilities</b>			
<i>Amortized cost</i>			
Borrowings	Level 3	33,904	31,291
Trade and other payables	Level 3	23,025	26,442
Advances payable	Level 3	2,661	2,502

IFRS 13 - "Fair value measurement", requires an explanation about how fair value is determined for assets and liabilities measured in the financial statements at fair value and established a hierarchy into which these assets and liabilities must be grouped based on whether inputs to those valuation techniques are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect the Company's assumptions. The two types of inputs create the following fair value hierarchy:

- Level 1: observable inputs such as quoted prices in active markets;
- Level 2: inputs, other than the quoted market prices in active markets, which are observable, either directly and/or indirectly; and
- Level 3: unobservable inputs for the asset or liability in which little or no market data exists, therefore require an entity to develop its own assumptions.



## Finance income

The Company's finance income is summarized as follows:

	Year ended December 31, 2019	Year ended December 31, 2018
	\$'000	\$'000
Interest on loan to joint venture	(53,524)	(40,378)
Interest on bank balances	(13,612)	(7,074)
Interest on long term loan receivable - HPX	(2,740)	-
Interest on long term loan receivable - Gecamines	(2,492)	(2,407)
Other	(27)	-
	(72,395)	(49,859)

The interest from the loan to the joint venture is interest earned from the Kamoa Holding joint venture on shareholder loans advanced by the Company where each shareholder is required to fund Kamoa Holding in an amount equivalent to its proportionate shareholding interest.

## Financial risk management objectives and policies

The risks associated with the Company's financial instruments and the policies on how to mitigate these risks are set out below. Management manages and monitors these exposures to ensure appropriate measures are implemented in a timely and effective manner.

### *Foreign exchange risk*

The Company incurs certain of its expenses in currencies other than the U.S. dollar. The Company also has foreign currency denominated monetary assets and liabilities. As such, the Company is subject to foreign exchange risk as a result of fluctuations in exchange rates. The Company enters into derivative instruments to manage foreign exchange exposure as deemed appropriate.

The carrying amount of the Company's foreign currency denominated monetary assets and liabilities at the respective statement of financial position dates are as follows:

	December 31, 2019	December 31, 2018
	\$'000	\$'000
<b>Assets</b>		
Canadian dollar	41,358	180,321
South African rand	24,386	16,848
British pounds	7,387	5,257
Australian dollar	1,141	1,924
<b>Liabilities</b>		
South African rand	(9,484)	(7,325)
British pounds	(7,008)	(3,427)
Canadian dollar	(718)	(571)

### Foreign currency sensitivity analysis

The following table details the Company's sensitivity to a 5% increase or decrease in the U.S. dollar against the foreign currencies presented. The sensitivity analysis includes only outstanding foreign currency denominated monetary items not denominated in the functional currency of the Company or the relevant subsidiary and adjusts their translation at the end of the period for a 5% change in foreign currency rates. A positive number indicates a decrease in loss for the year where the foreign currencies strengthen against the U.S. dollar. The opposite number will result if the foreign currencies depreciate against the U.S. dollar.

	<b>Year ended December 31, 2019 \$'000</b>	<b>Year ended December 31, 2018 \$'000</b>
Canadian dollar	2,032	8,987
Australian dollar	57	96
South African rand	(104)	(85)
British pounds	(8)	(7)

### *Credit risk*

Credit risk is the risk of an unexpected loss if a customer or third party to a financial instrument fails to meet its contractual obligations. Credit risk for the Company is primarily associated with the loan to the joint venture, promissory note receivable, long term loans receivable, other receivables and cash and cash equivalents.

The Company reviews the recoverable amount of their financial assets at each statement of financial position date to ensure that adequate impairment losses are made for irrecoverable amounts. The Company has considered the requirement of IFRS 9 to recognize a loss allowance for expected credit losses on financial assets. The general approach was applied to these financial assets, where the 12 month expected credit losses are calculated. The Company did not apply lifetime expected credit losses as there has not been a significant increase in credit risk in 2019.

A significant increase in credit risk would include:

- Existing or forecast adverse changes in business, financial or economic conditions that are expected to cause a significant change in the borrower's ability to meet its debt obligations.
- An actual or expected significant change in the operating results of the borrower.
- Significant increases in credit risk on other financial instruments of the same borrower.
- An actual or expected significant adverse change in the regulatory, economic, or technological environment of the borrower that results in a significant change in the borrower's ability to meet its debt obligations.
- Significant changes in the value of the collateral supporting the obligation or in the quality of third-party guarantees or credit enhancements, which are expected to reduce the borrower's economic incentive to make scheduled contractual payments or to otherwise have an effect on the probability of a default occurring.

The Company assesses whether an impairment is required on loan receivables. A range of cash flow scenarios are considered, taking into account forward looking information which may impact recoverability of loan receivables.

The loan advanced to the joint venture will be repaid as and when there is residual cash flow in Kamoa Holding. Due to the positive results of Kamoa-Kakula's PFS and Preliminary Economic Assessment, repayment of the loan is deemed to be highly probable.

The promissory note receivable will be repaid using proceeds from the sale of Crystal River's 1% stake in Kamoa Holding.

The principal amount of the long term loan receivable from HPX and accrued interest thereon, is convertible in whole, or part, by the Company at its sole discretion into shares of treasury common stock of HPX and/or a subsidiary of HPX. The loan is secured by a pledge of shares of an HPX subsidiary in the United States which is pursuing a Tier One copper-gold exploration and development project, into which the Company also may convert and acquire at least a 25% interest.

Repayment of the long term loan receivable from Gécamines will be made by offsetting the loan against future royalties and dividends payable to Gécamines which arise from future profits to be earned at Kipushi.

The credit risk on cash and cash equivalents is limited because the cash and cash equivalents are composed of deposits with major banks who have investment grade credit ratings assigned by international credit ratings agencies and have low risk of default.

Other receivables is comprised primarily of administration consulting income from the joint venture and refundable taxes. The credit quality of these financial assets can be assessed by reference to historical information about counterparty default rates and adjusted to reflect current and forward-looking information, as well as macroeconomic factors affecting the ability of the parties to settle the receivables. The historical loss rates are negligible and therefore indicate that no expected credit losses relating to other receivables should be recognized.

The Company continues to monitor its credit risk and assess expected credit losses. The identified impairment loss in 2019 is negligible.

#### *Interest rate risk*

The Company's interest rate risk arises mainly from long term borrowings, the long term loans receivable and the loan advanced to the joint venture. The Company's main exposure to interest rate risk arises from the fact that the Company earns and incurs interest on interest rates linked to USD LIBOR.

If interest rates (including applicable USD LIBOR rates) had been 50 basis points higher or lower and all other variables were held constant, the Company's loss for the year ended December 31, 2019 would have increased or decreased by \$5.0 million.

### *Liquidity risk*

In the management of its liquidity risk, the Company maintains a balance between continuity of funding and flexibility through the use of borrowings. Management closely monitors the liquidity position with the goal of maintaining adequate sources of funding to finance the Company's projects and operations.

The following table details the Company's expected remaining contractual maturities for its financial liabilities. The table is based on the undiscounted cash flows of financial liabilities based on the earliest date on which the Company can be required to satisfy the liabilities.

	Less than 1 month	1 to 3 months	3 to 12 months	More than 12 months	<b>Total undiscounted cash flows</b>
	\$'000	\$'000	\$'000	\$'000	<b>\$'000</b>
<b>As at December 31, 2019</b>					
Non-current borrowings	-	-	-	33,767	<b>33,767</b>
Trade and other payables	18,960	1,002	1,376	-	<b>21,338</b>
Lease liability	80	151	640	14,980	<b>15,851</b>
Current borrowings	-	-	4,230	-	<b>4,230</b>
<b>As at December 31, 2018</b>					
Trade and other payables	24,247	1,296	899	-	<b>26,442</b>
Non-current borrowings	-	-	-	36,656	<b>36,656</b>

Trade and other payables in the above table excludes payroll tax, other statutory liabilities and indirect taxes payable.

### **DESCRIPTION OF CAPITAL STOCK**

As at March 5, 2020, the Company's capital structure consists of an unlimited number of Class A common shares without par value (the "Class A Shares"), an unlimited number of Class B common shares without par value (the "Class B Shares") and an unlimited number of preferred shares without par value. At this date 1,197,952,760 Class A Shares, nil Class B Shares, nil warrants and nil preferred shares were issued and outstanding.

The Company granted 6,000,000 options in 2018, 7,500,000 options in 2019 and 10,034,900 options in 2020 to date. As at March 5, 2020, there were 27,434,000 options outstanding issued in terms of the Equity Incentive Plan exercisable into 27,434,000 Class A Shares.

The Company granted 1,069,211 restricted share units (RSUs) in 2020 to date, 2,098,333 RSUs in 2019 and 1,520,813 RSUs in 2018 per the Company's restricted share unit plan. As at March 5, 2020, there were 3,128,132 RSUs which may vest into 3,128,132 Class A Shares.

The Company granted 219,896 deferred share units (DSUs) in 2020 to date, 130,621 DSUs in 2019 and 44,926 DSUs in 2018 per the Company's deferred share unit plan. As at March 5, 2020, there were 402,155 DSUs which may settle into 402,155 Class A Shares.



## **DISCLOSURE CONTROLS AND PROCEDURES AND INTERNAL CONTROL OVER FINANCIAL REPORTING**

Management is responsible for the design and operation of disclosure controls and procedures (DC&P) and internal control over financial reporting (ICFR) in order to provide reasonable assurance that material information related to the Company, including its consolidated subsidiaries, is made known to the Company's certifying officers. The Company's President, in the capacity of Chief Executive Officer (CEO), and Chief Financial Officer (CFO) have each evaluated the design and operating effectiveness of the Company's DC&P and ICFR as of December 31, 2019 and, in accordance with the requirements established under National Instrument 52-109 - Certification of Disclosure in Issuer's Annual and Interim Filings, the President and CFO have concluded that these controls and procedures have been designed and operate to provide reasonable assurance that material information relating to the Company is made known to them by others within the Company and that the information required to be disclosed in reports that are filed or submitted under Canadian securities legislation are recorded, processed, summarized and reported within the time period specified in those rules.

As at December 31, 2019, management, including the President, in the capacity of CEO, and CFO, has evaluated the effectiveness of the design and operation of the Company's disclosure controls and procedures. Based upon the results of that evaluation, the President and CFO have concluded that as of the end of the period covered by this MD&A, the Company's disclosure controls and procedures were effective.

The Company's President and CFO have used the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework to evaluate the design and operation of the Company's ICFR as of December 31, 2019 and have concluded that these controls and procedures have been designed and operated effectively to provide reasonable assurance that financial information is recorded, processed, summarized and reported in a timely manner. Management of the Company was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. The result of the inherent limitations in all control systems means design and operation of controls cannot provide absolute assurance that all control issues and instances of fraud will be detected.

As at December 31, 2019, management assessed the effectiveness of the Company's internal control over financial reporting and concluded that the Company's internal control over financial reporting was effective.

During the year ended December 31, 2019, there were no changes in the Company's DC&P or ICFR that materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

## **RISK FACTORS**

The Company has summarized its foreign exchange risk, credit risk, interest rate risk and liquidity risk under the "Financial risk management objectives and policies" sub-heading under the "Financial instruments and other instruments" section in this MD&A. Additional risks and uncertainties are discussed in the Company's Annual Information Form filed with Canadian provincial regulatory authorities and available at [www.sedar.com](http://www.sedar.com).

## **DISCLOSURE OF TECHNICAL INFORMATION**

Disclosures of a scientific or technical nature regarding the revised capital expenditure and development scenarios at the Kamo-Kakula Project in this MD&A have been reviewed and approved by Steve Amos, who is considered, by virtue of his education, experience and professional association, a Qualified Person under the terms of NI 43-101. Mr. Amos is not considered independent under NI 43-101 as he is the Head of the Kamo-Kakula Project. Mr. Amos has verified the technical data disclosed in this MD&A.

Other disclosures of a scientific or technical nature in this MD&A have been reviewed and approved by Stephen Torr, who is considered, by virtue of his education, experience and professional association, a Qualified Person under the terms of NI 43-101. Mr. Torr is not considered independent under NI 43-101 as he is the Senior Vice President, Project Geology and Evaluation. Mr. Torr has verified the other technical data disclosed in this MD&A.

Ivanhoe has prepared a current, independent, NI 43-101-compliant technical report for each of the Platreef Project, the Kipushi Project and the Kamo-Kakula Project, which are available under the Company's SEDAR profile at [www.sedar.com](http://www.sedar.com):

- The Kamo-Kakula Integrated Development Plan 2019 dated March 18, 2019, prepared by OreWin Pty Ltd., Amec Foster Wheeler E&C Services Inc. (a division of Wood PLC), DRA Global, SRK Consulting (South Africa) (Pty) Ltd and Stantec Consulting International LLC, covering the Company's Kamo-Kakula Project;
- The Platreef 2017 Feasibility Study Technical Report dated September 4, 2017, prepared by DRA Global, OreWin Pty Ltd., Amec Foster Wheeler, Stantec Consulting, Murray & Roberts Cementation, SRK Consulting, Golder Associates and Digby Wells Environmental, covering the Company's Platreef Project; and
- The Kipushi 2019 Mineral Resource Update dated March 28, 2019, prepared by OreWin Pty Ltd., MSA Group (Pty) Ltd., SRK Consulting (South Africa) (Pty) Ltd and MDM (Technical) Africa Pty Ltd. (a division of Wood PLC), covering the Company's Kipushi Project.

These technical reports include relevant information regarding the effective dates and the assumptions, parameters and methods of the mineral resource estimates on the Platreef Project, the Kipushi Project and the Kamo-Kakula Project cited in this MD&A, as well as information regarding data verification, exploration procedures and other matters relevant to the scientific and technical disclosure contained in this MD&A in respect of the Platreef Project, Kipushi Project and Kamo-Kakula Project.

## **ADDITIONAL INFORMATION**

Additional information regarding the Company, including the Company's Annual Information Form, is available on SEDAR at [www.sedar.com](http://www.sedar.com).