

# Palladium prices hit an all-time high of US\$1,781 an oz, propelling Ivanhoe's Platreef Project 'metals-price basket' to a new, multi-year high

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## Mine development progressing at Ivanhoe's Tier One palladium-platinum-nickel-copper-gold-rhodium mine development project in South Africa

Mokopane, October 17, 2019 - Ivanhoe Mines' (TSX: IVN) (OTCQX: IVPAF) Co-Chairmen Robert Friedland and Yufeng "Miles" Sun announced today that the spot price of palladium has reached another all-time high of US\$1,781 an ounce.

Recent increases in the price of palladium, nickel, rhodium and gold has resulted in the weighted price of the 'basket' of metals contained in the ore at the Platreef palladium-platinum-rhodium-nickel-copper-gold project to rise to a new, multi-year high.

Figure 1. Revenue per tonne of ore at the Platreef Project has risen steadily since 2016 (shown in US dollars)

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Figure 2. Revenue per tonne of ore at the Platreef Project has risen steadily since 2016 (shown in South African rand).

To view an enhanced version of Figure 2, please visit:  
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Source for figures 1 & 2: Bloomberg. Based on historical weekly commodity prices at the end of each week.

Notes for Figures 1 and 2:

1. Based on Platreef Mineral Reserves with an effective date of May 24, 2017.
2. Probable Mineral Reserve of 124.7 million tonnes at a grade of 1.95 grams per tonne (g/t) platinum, 2.01 g/t palladium, 0.30 g/t gold, 0.14 g/t rhodium, 0.34% nickel and 0.17% copper.
3. A declining NSR cut-off of \$155 per tonne (t) to \$80/t was used for the Mineral Reserve estimates.
4. The NSR cut-off is an elevated cut-off above the marginal economic cut-off.
5. Metal prices used in the Mineral Reserve estimate: US\$1,600 per ounce (oz) platinum, US\$815/oz palladium, US\$1,300/oz gold, US\$1,500/oz rhodium, US\$8.90 per pound (lb) nickel and US\$3.00/lb copper.
6. Metal prices used in the DFS economic analysis: US\$1,250/oz platinum, US\$825/oz palladium, US\$1,300/oz gold, US\$1,000/oz rhodium, US\$7.60/lb nickel and US\$3.00/lb copper.
7. Tonnage and grade estimates include dilution and mining recovery allowances.
8. Applies life-of-mine average recoveries of 87.4% for platinum, 86.9% for palladium, 78.6% for gold, 80.5% for rhodium, 87.9% for copper and 71.9% for nickel.
9. Total cash cost includes mine site costs, plus realization costs such as treatment and refining charges, royalties and transportation.

10. LT Street Consensus is based on a survey of brokers' long-term metal prices estimates and includes: US\$1,000/oz platinum, US\$1,150/oz palladium, US\$1,350/oz gold, US\$1,820/oz rhodium, US\$7.08/lb nickel and US\$3.00/lb copper.

Palladium, nickel and rhodium have been three of the best performing metals in 2019. The platinum-to-palladium ratio at Platreef is approximately 1:1, and Platreef has remarkably high concentrations of nickel and copper. At current prices, palladium and nickel comprise more than 60% of the weighted price of the 'basket' of metals in Platreef's ore. Rhodium and gold also add significant contributions to Platreef's contained metal valuation.

"While many investors are focused on gold, palladium has been far and away the best performing precious metal for the past several years. The strong, upward price appreciation since 2016 of the collective basket of metals to be produced by Platreef when commercial operations commence at the Tier One discovery is encouraging," said Mr. Friedland.

"Platreef is a massive, high-grade, long-life deposit that will produce a suite of vital metals, many of which are essential to sustain our urbanizing planet. The nickel and copper by-products are essential in the electric car revolution, and platinum and palladium are equally vital for hydrogen fuel cell technology and catalytic converters to clean the air."

"Given recent transactions in the platinum-group-metals market, we are exploring a number of options that can help us unlock Platreef's incredible value for the benefit of all of Ivanhoe's stakeholders."

Platreef's flat-lying mineralized zones are up to 90 metres thick, at a 1 g/t 3PE+ Au cut-off, with platinum-group-metals grades that are as high, or higher, than many of the narrow-veined PGM mines on South Africa's eastern and western limbs. Platreef also has large quantities of nickel, copper and gold, which are expected to establish Platreef as the lowest-cost PGM producer in Africa.

Based on independent analysis prepared in the 2017 definitive feasibility study (DFS), Platreef is projected to have a cash cost of US\$351 per ounce of 3PE+Au, net of nickel and copper by-products, and including sustaining capital costs. The DFS estimated that Platreef's initial, average annual production rate will be approximately 219,000 ounces of palladium, 214,000 ounces of platinum, 30,000 ounces of gold and 14,000 ounces of rhodium (combined 477,000 ounces of 3PE+Au), plus 21 million pounds of nickel and 13 million pounds of copper.

The mineral resources used as the basis of the DFS were those amenable to underground selective mining. Information on Platreef Project geology and mineralization is contained in the Platreef Project National Instrument (NI) 43-101 Technical Report dated September 4, 2017, filed on SEDAR at [www.sedar.com](http://www.sedar.com) and on the Ivanhoe Mines website at [www.ivanhoemines.com](http://www.ivanhoemines.com).

As detailed in Table 1 below, Platreef's Indicated Mineral Resources contain an estimated 26.8 million ounces of palladium, 25.6 million ounces of platinum, 4.5 million ounces of gold, and 1.8 million ounces of rhodium (a combined 58.7 million ounces of PGMs plus gold), plus 4.1 billion pounds of nickel and 2.1 billion pounds of copper, at a cut-off grade of 1 gram per tonne.

Platreef's Inferred Mineral Resources contain an additional 43.0 million ounces of palladium, 40.4 million ounces of platinum, 7.8 million ounces of gold, and 3.1 million ounces of rhodium (a combined 94.3 million ounces PGMs plus gold), plus 7.7 billion pounds of nickel and 4.1 billion pounds of copper, also at a cut-off grade of 1 gram per tonne.

Table 1. Platreef's Mineral Resources amenable to underground selective mining methods (base case is highlighted).

		Indicated Mineral Resources						
		Tonnage and Grades						
Cut-off	Mt	Pt	Pd	Au	Rh	3PE+Au	Cu	Ni
3PE+Au		(g/t)	(g/t)	(g/t)	(g/t)	(g/t)	(%)	(%)

3 g/t	204	2.11	2.11	0.34	0.14	4.7	0.18	0.35
2 g/t	346	1.68	1.70	0.28	0.11	3.77	0.16	0.32
1 g/t	716	1.11	1.16	0.19	0.08	2.55	0.13	0.26
Indicated Mineral Resources								
Contained Metal								
Cut-off		Pt	Pd	Au	Rh	3PE+Au	Cu	Ni
3PE+Au		(Moz)	(Moz)	(Moz)	(Moz)	(Moz)	(Mlb)	(Mlb)
3 g/t		13.9	13.9	2.2	0.9	30.9	800	1,597
2 g/t		18.7	18.9	3.1	1.2	41.9	1,226	2,438
1 g/t		25.6	26.8	4.5	1.8	58.8	2,076	4,108
Inferred Mineral Resources								
Tonnage and Grades								
Cut-off	Mt	Pt	Pd	Au	Rh	3PE+Au	Cu	Ni
3PE+Au		(g/t)	(g/t)	(g/t)	(g/t)	(g/t)	(%)	(%)
3 g/t	225	1.91	1.93	0.32	0.13	4.29	0.17	0.35
2 g/t	506	1.42	1.46	0.26	0.10	3.24	0.16	0.31
1 g/t	1431	0.88	0.94	0.17	0.07	2.05	0.13	0.25
Inferred Mineral Resources								
Contained Metal								
Cut-off		Pt	Pd	Au	Rh	3PE+Au	Cu	Ni
3PE+Au		(Moz)	(Moz)	(Moz)	(Moz)	(Moz)	(Mlb)	(Mlb)
3 g/t		13.8	14.0	2.3	1.0	31.0	865	1,736
2 g/t		23.2	23.8	4.3	1.6	52.8	1,775	3,440
1 g/t		40.4	43.0	7.8	3.1	94.3	4,129	7,759

1. Mineral Resources have an effective date of April 22, 2016. The Qualified Persons for the estimate are Dr. Harry Parker, RM SME, and Mr. Timothy Kuhl, RM SME.
2. Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
3. The 2 g/t 3PE+Au cut-off is considered the base-case estimate and is highlighted. The rows are not additive.
4. Mineral Resources are reported on a 100% basis. Mineral Resources are stated from approximately -200 m to 650 m elevation (from 500 m to 1,350 m depth). Indicated Mineral Resources are drilled on approximately 100 x 100 m spacing; Inferred Mineral Resources are drilled on 400 x 400 m (locally to 400 x 200 m and 200 x 200 m) spacing.
5. Reasonable prospects for eventual economic extraction were determined using the following assumptions. Assumed commodity prices are Platinum: \$1,600/oz; palladium: \$815/oz; gold: \$1,300/oz; rhodium: \$1,500/oz; copper: \$3.00/lb; and nickel: \$8.90/lb. It has been assumed that payable metals would be 82% from smelter/refinery and that mining costs (average \$34.27/t) and process, general and administrative costs, and concentrate transport costs (average \$15.83/t of mill feed for a four Mtpa operation) would be covered. The processing recoveries vary with block grade but typically would be 80%-90% for platinum, palladium and rhodium; 70-90% for gold; 60-90% for copper; and 65-75% for nickel.
6. 3PE+Au = platinum, palladium, rhodium and gold.
7. Totals may not sum due to rounding.

Platreef's Shaft 1 at a depth of 950 metres below surface; shaft completion to final depth of 1,000 metres expected by mid-2020

Good progress continues to be made on Shaft 1's 950-metre-level station &#9472; the third and final horizontal mining access station planned for Shaft 1 at the company's Platreef Project on the northern limb of the Bushveld Complex, adjacent to Anglo Platinum's Mogalakwena Mine.

Minor revisions to the 950-metre-level station layout have been made to accommodate rock-handling arrangements to facilitate potential early development from Shaft 1.

Shaft 1 is expected to reach its projected, final depth of approximately 1,000 metres below surface, complete with all access stations, by mid-2020. The mining zones in the current Platreef Mine plan occur at depths ranging from approximately 700 metres to 1,200 metres below surface.

Ivanhoe Mines indirectly owns 64% of the Platreef Project through its subsidiary, Ivanplats, and is directing all mine development work. The South African beneficiaries of the approved broad-based, black economic empowerment structure have a 26% stake in the Platreef Project. The remaining 10% is owned by a Japanese consortium of ITOCHU Corporation; Japan Oil, Gas and Metals National Corporation; and Japan Gas Corporation.

Image 1: Moolmans (formerly Aveng) shaft-sinking miners drilling the brow for Shaft 1's 950-metre station.

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Image 2: Jan Mapeka, one of Platreef's geologists, ready to proceed underground to conduct a borehole camera inspection of Shaft 1's development.

To view an enhanced version of Image 2, please visit:

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#### Qualified person

The scientific and technical information in this news release has been reviewed and approved by Stephen Torr, P.Geo., Ivanhoe Mines' Vice President, Project Geology and Evaluation, a Qualified Person under the terms of National Instrument (NI) 43-101. Mr. Torr is not independent of Ivanhoe Mines. Mr. Torr has verified the technical data disclosed in this news release.

Ivanhoe has prepared a current, independent, NI 43-101-compliant technical report for the Platreef Project titled "The Platreef 2017 Feasibility Study Technical Report" dated September 4, 2017, prepared by DRA Global, OreWin, Amec Foster Wheeler, Stantec Consulting, Murray & Roberts Cementation, SRK Consulting, Golder Associates and Digby Wells Environmental. Detailed information about assay methods and data verification measures used to support the scientific and technical information is set out in the Platreef Technical Report, which is available under Technical Reports at [www.ivanhoemines.com](http://www.ivanhoemines.com) and on Ivanhoe Mines' SEDAR profile at [www.sedar.com](http://www.sedar.com).

#### About Ivanhoe Mines

Ivanhoe Mines is a Canadian mining company focused on advancing its three principal projects in Southern Africa: the development of new mines at the Kamoa-Kakula copper discovery in the Democratic Republic of Congo (DRC) and the Platreef palladium-platinum-nickel-copper-gold discovery in South Africa; and the extensive redevelopment and upgrading of the historic Kipushi zinc-copper-germanium-silver mine, also in the DRC. The company also is exploring for new copper discoveries on its wholly-owned Western Foreland exploration licences, adjacent to the Kamoa-Kakula mining licence.

#### Information contacts

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#### Cautionary statement on forward-looking information

Certain statements in this news release constitute "forward-looking statements" or "forward-looking information" within the meaning of applicable securities laws. Such statements involve known and unknown risks, uncertainties and other factors, which may cause actual results, performance or achievements of the

company, the Platreef Project, 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 news release.

The forward-looking statements and forward-looking information in this news release include without limitation, (i) statements regarding the expectation that Shaft 1 will reach its projected, final depth of approximately 1,000 metres below surface, complete with the stations, in mid-2020; (ii) statements regarding Platreef is projected to have a cash cost of US\$351 per ounce of 3PE+Au, net of nickel and copper by-products, and including sustaining capital costs; (iii) and statements regarding Platreef's initial, average annual production rate will be approximately 219,000 ounces of palladium, 214,000 ounces of platinum, 30,000 ounces of gold and 14,000 ounces of rhodium (combined 477,000 ounces of 3PE+Au), plus 21 million pounds of nickel and 13 million pounds of copper.

Readers are cautioned that actual results may vary from those presented.

All such forward-looking information and statements are based on certain assumptions and analyses made by Ivanhoe Mines' management in light of their experience and perception of historical trends, current conditions and expected future developments, as well as other factors management believe are appropriate in the circumstances. These statements, however, are subject to a variety of risks and uncertainties and other factors that could cause actual events or results to differ materially from those projected in the forward-looking information or statements including, but not limited to, unexpected changes in laws, rules or regulations, or their enforcement by applicable authorities; the failure of parties to contracts to perform as agreed; social or labour unrest; changes in commodity prices; unexpected failure or inadequacy of infrastructure, industrial accidents or machinery failure (including of shaft sinking equipment), or delays in the development of infrastructure; and the failure of exploration programs or other studies to deliver anticipated results or results that would justify and support continued studies, development or operations. Other important factors that could cause actual results to differ from these forward-looking statements also include those described under the heading "Risk Factors" in the company's most recently filed MD&A, as well as in the most recent Annual Information Form filed by Ivanhoe Mines. Readers are cautioned not to place undue reliance on forward-looking information or statements. Certain of the factors and assumptions used to develop the forward-looking information and statements, and certain of the risks that could cause the actual results to differ materially are presented in the "Platreef 2017 Feasibility Study, September 2017" available on SEDAR at [www.sedar.com](http://www.sedar.com) and on the Ivanhoe Mines website at [www.ivanhoemines.com](http://www.ivanhoemines.com).

Although the forward-looking statements contained in this news release 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 news release 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 news release.

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