

# Happy Creek's Fox now at 4.8 million Kg W03 indicated and 6.9 million Kg W03 inferred

written by Raj Shah | February 28, 2018



February 27, 2018 ([Source](#)) – Happy Creek Minerals Ltd. (TSXV: HPY) (the “Company”), is pleased to announce an update to its mineral resource estimate completed in accordance with NI 43-101 for the Ridley Creek and BN zones, as well as a first-time

resource estimate for the BK zone on its 100% owned Fox tungsten property. The Fox property is located 75 km northeast of 100 Mile House in the south-central Cariboo region of British Columbia, Canada.

The Fox property contains a recently discovered, large scale, 10 km by 3 km tungsten skarn mineral system containing seven mineralized zones and numerous showings at surface. The current resource is for the Ridley Creek, BN and BK Zones, which are portions of a 3 km long skarn horizon that outcrops at surface and dips gently westward.

The total Indicated Resources for the Ridley Creek zone amount to 582,400 tonnes grading 0.826% W03 and the total Inferred Resource is now 565,000 tonnes grading 1.231% W03 for the Ridley Creek, BN and BK Zones combined. Based on what is now among the highest cut-off grades reported in the industry, this represents an increase in contained tungsten of 21% for indicated and 22.9% for inferred from the previously reported January 2017 resource estimates and demonstrates the continuing increase in scale of the project as work proceeds. The selected cut-off for the

material amenable to open pit extraction is 0.175% W03 and for material amenable to underground extraction, a cut-off of 0.45% W03 was applied.

Table 1: Resource Estimate at 0.175% W03 and 0.45% W03 Cut-off

ZONE	CLASSIFICATION	Cut-off W03 (%)	Tonnes (t)	W03 (%)	W03 MTU	W03 (kg) Contained
Ridley Creek	Indicated in-pit	>0.175	397,400	0.713	283,400	2,834,000
Ridley Creek	Indicated - underground	>0.45	185,000	1.067	197,100	1,970,600
Ridley Creek zone	Indicated total		582,400	0.826	480,500	4,805,000
Ridley Creek	Inferred in-pit	>0.175	14,700	0.662	9,700	97,000
Ridley Creek	Inferred - underground	>0.45	76,800	0.961	73,800	738,100
BN	Inferred - underground	>0.45	453,000	1.321	598,300	5,983,200
BK	Inferred in-pit	>0.175	20,900	0.672	14,000	140,400
Ridley Creek, BN, BK	Inferred total		565,400	1.231	695,800	6,959,100

Note: Cut-off determined by using a W03 price of CDN\$285/MTU W03 in concentrate.

David Blann, P.Eng., President and CEO, comments: “This update has added more quality resources and is another step forward for the Fox property. It remains among the highest grade in the western world, comparable to the now closed Cantung mine in the Yukon/Northwest Territories, and the Fox is much closer to infrastructure and in a better operating climate. We have not yet included the potential for by-products zinc, indium, bismuth, gold and silver values which would require more detailed metallurgical testing for a more advanced economic study. The three zones with resources remain open to expansion and comprise a portion of a three-kilometre-long horizon having wide gaps that remain un-tested by drilling. In addition, the South Grid and Nightcrawler Zones have both returned positive

drill intercepts to follow up that are well above cut-off. With the current resource and clear opportunity to expand it, we are confident that the project can progress to the next stage of development and have initiated engineering and environmental-related data collection for more advanced permitting and economic study. The Fox property continues to advance as a new high-grade tungsten project in the western world.”

Table 2a, b, c and d, show the sensitivity of the model to changes in cut-off with the selected cut-off highlighted.

Table 2a: Sensitivity to cut-off grade for the Ridley Creek zone within the resource constraining pit shell

Zone	Classification	W03 Cut-off	Tonnage	W03	W03
		(%)	(T)	(%)	(MTU)
RC Zone within the resource constraining shell	Indicated	> 0.40	353,000	0.765	270,000
		> 0.35	368,000	0.749	275,700
		> 0.30	377,700	0.738	278,900
		> 0.20	392,700	0.720	282,600
		> 0.175	397,400	0.713	283,400
		> 0.15	403,500	0.705	284,400
	Inferred	> 0.40	13,400	0.692	9,300
		> 0.35	14,200	0.673	9,600
		> 0.30	14,700	0.662	9,700
		> 0.20	14,700	0.662	9,700
		> 0.175	14,700	0.662	9,700
		> 0.15	14,700	0.662	9,700

Table 2b: Sensitivity to cut-off grade for the Ridley Creek zone below the resource constraining shell (Underground amenable)

Zone	Classification	W03 Cut-off	Tonnage	W03	W03
		(%)	(T)	(%)	(MTU)
RC Zone Below the resource constraining shell	Indicated	> 0.70	141,800	1.217	172,500
		> 0.60	159,200	1.156	184,000
		> 0.55	166,300	1.131	188,000
		> 0.50	173,100	1.107	191,600
		> 0.45	184,700	1.067	197,100
		> 0.40	198,500	1.022	202,900
		> 0.30	228,800	0.933	213,400
	Inferred	> 0.70	54,200	1.118	60,600
		> 0.60	64,800	1.041	67,400
		> 0.55	69,600	1.009	70,200
		> 0.50	72,900	0.988	72,000
		> 0.45	76,800	0.961	73,800
		> 0.40	84,500	0.913	77,100
		> 0.30	92,300	0.866	79,900

Table 2c: Sensitivity to cut-off grade for the BN Zone Inferred resource amenable to underground extraction.

Zone	Classification	W03 Cut-off	Tonnage	W03	W03
		(%)	(T)	(%)	(MTU)
BN Zone	Inferred	> 0.70	321,400	1.634	525,100
		> 0.60	360,500	1.527	550,400
		> 0.55	381,100	1.475	562,300
		> 0.50	420,000	1.387	582,600
		> 0.45	453,000	1.321	598,300
		> 0.40	498,800	1.238	617,800
		> 0.30	655,100	1.027	672,700

Table 2d: Sensitivity to cut-off grade for the BK Zone Inferred resource within the resource constraining pit shell

Zone	Classification	W03 Cut-off	Tonnage	W03	W03
		(%)	(T)	(%)	(MTU)
BK Zone	Inferred	> 0.40	20,100	0.685	13,800
		> 0.35	20,600	0.677	14,000
		> 0.30	20,600	0.677	14,000
		> 0.20	20,900	0.672	14,000
		> 0.175	20,900	0.672	14,000
		> 0.15	20,900	0.672	14,000

Table 3: Change from previous estimate

Date	February 2018 Resource			January 2017 Resource				Difference	
Zones	RC + BN + BK Zones			RC+ BN Zones					
W03% Cut-off	> 0.175 OP and > 0.450 UG			> 0.2 OP and > 0.55 UG					
Classification	Tonnage	W03	W03	Tonnage	W03	W03	Tonnage	Grade	MTU
	(T)	(%)	(MTU)	(T)	(%)	(MTU)	% Diff.	Diff.	% Diff
Indicated	582,400	0.826	480,500	486,000	0.818	397,000	19.8%	0.01	21.0%
Inferred	565,400	1.231	695,800	361,000	1.568	566,000	56.6%	-0.34	22.9%

The quantity and grade of reported Inferred resources in this estimation must be regarded as conceptual in nature and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological grade or quality of continuity. For these reasons, an inferred resource has a lower level of confidence than an indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

Mineral Resources that are not Mineral Reserves do not have

demonstrated economic viability.

Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grade, and contained metal content in all tables presented in this press release

Tungsten assays are reported in percent  $WO_3$  (tungsten trioxide), the chemical compound for which tungsten market prices are published. Quantities of  $WO_3$  are traditionally reported in Metric Ton Units, which are equal to 10 kg of  $WO_3$ . For example, a grade of 0.8%  $WO_3$  contains 8 kg of  $WO_3$ /tonne.

A NI 43-101 technical report for the Fox Tungsten Project mineral resource estimate will be filed on SEDAR within 45 days.

#### **NOTES ON THE MINERAL RESOURCE ESTIMATE PARAMETERS AND METHOD**

- Mineral resources are estimated in conformance with the CIM Mineral Resource definitions referred to in NI 43-101 Standards of Disclosure for Mineral Projects. This mineral resource estimate is an update of the January 26th, 2017 estimate conducted by AGP Mining Consultants Inc. covering the Ridley Creek Zone (RC Zone) and the BN Zone. The estimate is also a first-time resource estimate for the BK Zone.
- The estimate was completed based on the concept of a small scale, open pit for the BK Zone, a small scale open pit and underground room and pillar operation for the RC Zone and a small scale, underground room and pillar mining operation for the BN Zone. No other zones on the Fox Tungsten Project were evaluated.
- All samples prior to the 2016 drill campaign were sent to the Agat Laboratory facility in Vancouver, B.C., using a chain of custody, where they were prepared and analyzed

first with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For samples within and adjacent to the tungsten-mineralized domain, a peroxide fusion digestion and ICP/OES finish was performed in triplicate and averaged, providing results in percent W (tungsten). A portion of these that returned greater than 0.6% tungsten, were again repeated using XRF analyses.

- For the 2016 drill campaign, the samples were sent to SGS Laboratory facility located in Vancouver. Samples were crushed to 90% passing 2mm. A 250g split was pulverized to 85% passing 75 microns. The samples were first analysed with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For tungsten, all samples were analysed using a peroxide fusion digestion and ICP/AES finish. Over limits tungsten samples were re-analysed with pyrosulphate fusion XRF.
- For the 2017 drill campaign, the samples were sent to SGS Laboratory facility located in Vancouver. Samples preparation remain the same as samples submitted during the 2016 drill campaign. In 2017, the samples were first analysed with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For tungsten, samples grading above 40 ppm W were analysed using a peroxide fusion digestion and ICP/AES finish. Over-limit tungsten samples were re-analysed with pyrosulphate fusion XRF.
- The quality control and quality assurance program remain the same as previous years. For every 10 samples submitted, Happy Creek Mineral inserted either a blank, a certified reference standard, or a  $\frac{1}{4}$  core duplicate sample in the sequence. In addition, Agat and SGS Laboratory conducts its own quality assurance/quality control (QA/QC) and reports these with every work order.
- The RC Zone model was interpolated with 81 core holes and 23 trenches completed by Happy Creek from 2010 through to

2017, totalling 5,612 metres and containing 2,214 assays. The BN Zone model is supported by 52 drill holes completed by Happy Creek in 2016 and 2017 totalling 6,366 meters of drilling and containing 1,213 assays. The BK Zone model is supported by 6 drill holes and 12 trenches, totalling 308 metres and containing 96 assays.

- The 3D wireframes developed to control the grade interpolation of the resource model were based primarily on lithology and included the construction of a mineralized wireframe within the calc-silicate/skarn lithology to control the extent of the mineralization to reasonable distance from the drill data. At the RC and BK Zones the models were enhanced by the addition of the high grade probabilistic model in order to reduce the dilution of the higher-grade material with the adjoining lower-grade material. This methodology assumes a certain degree of selectivity which can be achieved via the selection of small equipment, mining on 2.5-meter flitches and the use of UV lamps.
- Happy Creek preferentially samples the drill core in either 1 m or 2 m intervals. The nominal composite length was 2.5 m. The composite intervals were created moving downward from the collar of the drill hole toward the bottom of the drill hole. Composites lengths are automatically adjusted by the software to leave no remnants at the lithological boundaries.
- For the treatment of outliers on the RC Zone, raw assays were capped at 8.0% and 0.18 %  $WO_3$  in the CSSK (calc-silicate) and GRA (granite) domains in combination with a search restriction applied on the low-grade composite values greater than 1.0%  $WO_3$ . The procedure used allows the deposit to retain the high-grade assays while limiting their influence during the interpolation to a maximum of 60 m x 38 m x 15 m (length x width x height). The BN Zone



assays were capped at 6%  $W\text{O}_3$  and for the BK Zone, raw assays were capped at 3.8% and 0.08 %  $W\text{O}_3$  in the CSSK (calc-silicate) and GRA (granite) domains. A high-grade search restriction was not necessary for BN and BK since the coefficient of variation was less than 2.0 indicating the data does not show a high variability.

- Densities were determined from 1045 representative rock samples from the RC and BN Zone using industry standard methods. For the material within the mineralized zone, a density of 2.85 g/cm<sup>3</sup> was applied to the calc-silicate lithology, and 2.68 g/cm<sup>3</sup> applied to the granite lithology. The calc-silicate mineralization at the BN zone was assigned a density of 2.84. For the material within the mineralized zone on the BK zone, a density of 2.86 g/cm<sup>3</sup> was applied to the calc-silicate lithology, and 2.65 g/cm<sup>3</sup> applied to the granite lithology.
- A (3D) geological and block model was generated using Geovia Gems software. The block model matrix size of 5 m x 5 m x 2.5 m (width x length x height) was selected with consultation with the engineering team from AGP and was based on the size deemed suitable for an open pit mining scenario drilling in 5-meter bench and mining in 2.5-meter flitches on the RC and BK Zone. The model matrix is also suitable for a room and pillar operation at the RC and BN Zone.
- A good variogram was obtained using the 3D data within the RC Zone mineralized envelope. The direction and plunge represented by the variogram coincide with the known interpreted plunge of the mineralization at the RC Zone. The nugget effect is moderate, at 55% of the sill value. At 96% of the sill, the maximum range is a little less than 100 m. The definition of the variogram near the origin was reasonable. The grade model was interpolated

using ordinary kriging and validated using inverse distance squared and nearest neighbour models. A variogram was attempted for the BN zone. Results were disappointing in term of orientation but sufficient to confirm the range used in the grade estimation.

- The interpolation was carried out in multiple passes with increasing search ellipsoid dimensions. For all zones, the classification was based primarily on the pass number, followed by an adjustment to the class model, based on diamond drilling density (core area), the distance to the closest sample. The krige efficiency was used as a modifier on the RC Zone.
- No mining plans have yet been completed for the deposit; however, from the geometry of the deposit, it seems likely that open pit mining, followed by an underground operation, may be considered for future extraction of the RC Zone. The BN Zone will likely be mined via a room and pillar operation with ramp access and the BK zone will likely be mined by open pit only.
- Preliminary metallurgical test work to date is based on several surface bulk samples and indicates the scheelite (tungsten mineral) can be recovered using primarily gravity methods and/or flotation to produce potentially acceptable commercial grades and containing no deleterious elements that would affect its ability to be sold. Potential by-products of zinc indium, bismuth, gold and silver have not been included in the resource estimate at this stage, but may be included in a future PEA, after more detailed metallurgy is performed.
- Under CIM definitions, Mineral Resources should have a reasonable prospect of economic extraction. A tungsten price of US\$230/MTU of  $WO_3$  in concentrate was used for the cut-off estimation. To assess the Mineral Resources, an in-situ resource cut-off grade of 0.175%  $WO_3$  has been

applied for potential open pit resources and 0.45%  $W_3$  for potential underground material.

- To further assess reasonable prospects of economic extraction, Lerchs-Grossman optimized shells were generated to constrain the potential open pit material.

Parameters used included:

- 50° slopes for the pit shell
- CDN\$8/t mining, CDN\$26/t milling, CDN\$10/t G&A operating costs
- 75.8%  $W_3$  recovery to a 68%  $W_3$  concentrate
- CDN\$285/MTU  $W_3$  price
- economics applied to Indicated and Inferred materials.

## **Qualified Persons**

David Blann, P.Eng., Director of the Company, is a Qualified Person as defined by National Instrument 43-101 and is responsible for the overall preparation and approval of the technical information disclosed in the news release.

Pierre Desautels, P.Geo. Principal Resource Geologist of AGP Mining Consultants Inc. Qualified Person under NI 43-101 who is independent of the Company, has prepared and authorized the release of the mineral resource estimates presented herein. Jay Melnyk, Eng., Principal Mining Engineer of AGP Mining Consultants Inc. and Qualified Person under NI 43-101 guidelines has reviewed the technical content of the News Release in relation to cut-off determination and the resource constraining shell.

On behalf of the Board of Directors,

*“David E Blann”*

---

David E Blann, P.Eng.

President, CEO

*Neither the TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release.*

*David Blann, P.Eng., Director, is a Qualified Person as defined by National Instrument 43-101 and is responsible for the preparation and approval of the technical information disclosed in the news release.*

*This press release contains "forward-looking information" within the meaning of applicable securities laws, including statements that address capital costs, recovery, grade, and timing of work or plans at the Company's mineral projects. Forward-looking information may be, but not always, identified by the use of words such as "seek", "anticipate", "plan", "planned", "continue", "expect", "thought to", "project", "predict", "potential", "targeting", "intends", "believe", "opportunity", "further" and others, or which describes a goal or action, event or result such as "may", "should", "could", "would", "might" or "will" be undertaken, occur or achieved. Statements also include those that address future mineral production, reserve potential, potential size or scale of a mineralized zone, potential expansion of mineralization, potential type(s) of mining, potential grades as well as to Happy creek's ability to fund ongoing expenditure, or assumptions about future metal or mineral prices, currency exchange rates, metallurgical recoveries and grades, favourable operating conditions, access, political stability, obtaining or renewal of existing or required mineral titles, licenses and permits, labour stability, market conditions, availability of equipment, accuracy of any*

mineral resources, anticipated costs and expenditures. Assumptions may be based on factors and events that are not within the control of Happy creek and there is no assurance they will prove to be correct. Such forward-looking information involves known and unknown risks, which may cause the actual results to materially differ, and/or any future results expressed or implied by such forward-looking information. Additional information on risks and uncertainties can be found within Financial Statements, Prospectus and other materials found on the Company's SEDAR profile at [www.sedar.com](http://www.sedar.com). Although Happy creek has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking information, there can be no assurance that such information will prove to be accurate as actual results and future events could differ materially from those anticipated in such statements. Happy creek withholds any obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, unless required by law.