Stantec

Memo

To:	Katherine St. James BC Environmental Assessment Office	From:	Matt White, Joanna Preston, Pam Hayward Glencore/Stantec
File:	123110482	Date:	November 6, 2018

Reference: **Proposed Sukunka Coal Mine Project - Response to Action Item #1 of the Caribou Sub-Working Group Meeting Held on October 16, 2018**

This memo provides a response to action item #1 and #3 from the caribou sub-working group meeting of the proposed Sukunka Coal Mine Project held on October 16, 2018 in Chetwynd, BC.

ACTION ITEM # 1

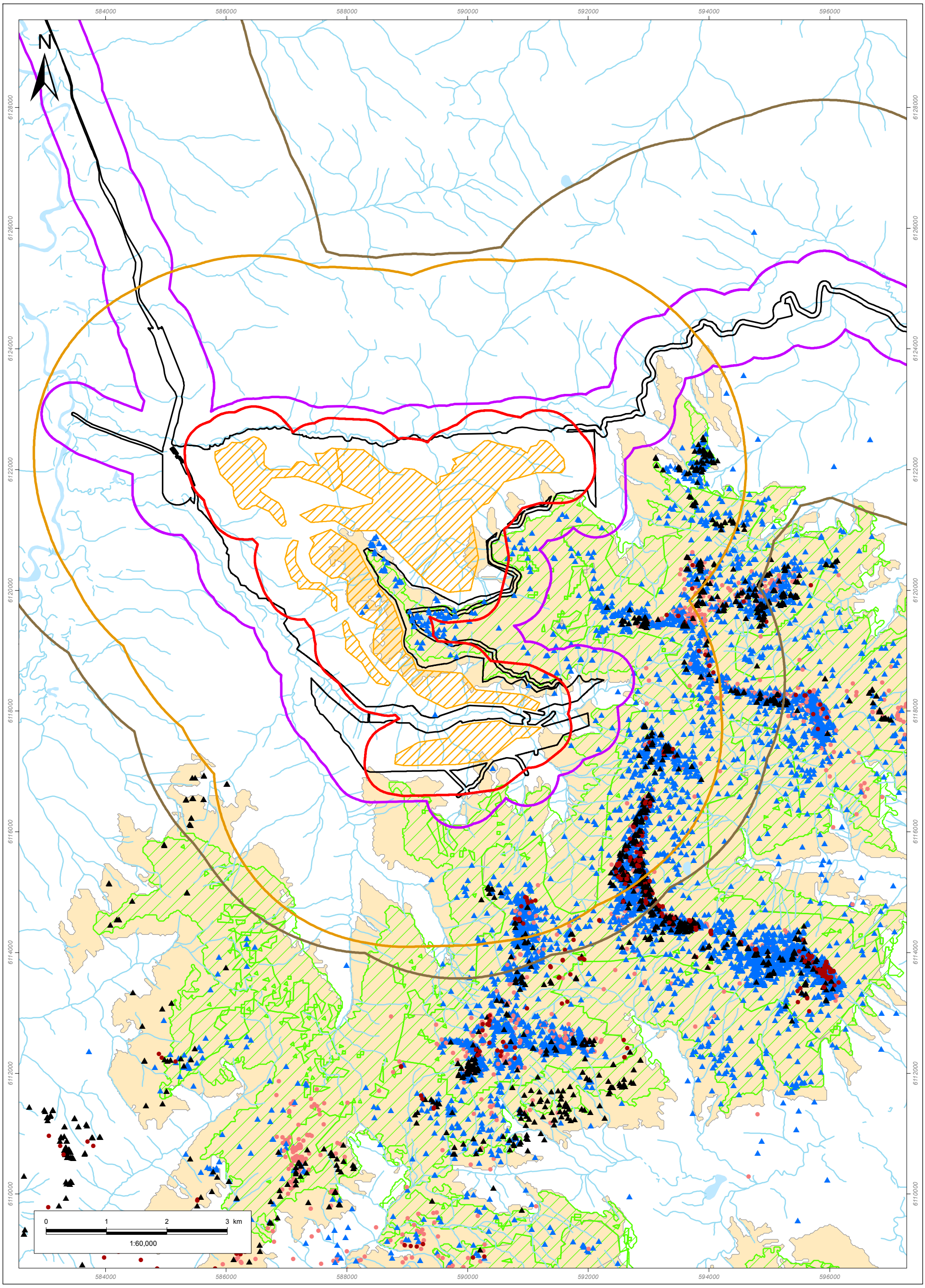
The caribou sub-working group requested Glencore to provide the following:

1. Figure showing the mine pits, environmental assessment (EA) boundary, 500 m and 3,000 m buffers, high elevation summer and winter ranges, and summer and winter caribou telemetry locations
2. Area of overlap of high elevation range within 500 m and 3,000 m of the mine pits in comparison to 500 m and 3,000 m buffers of the EA boundary
3. Caribou telemetry locations within 500 m and 3,000 m of the mine pits in comparison to 500 m and 3,000 m buffers of the EA boundary

The calculation of proportion of area and telemetry locations in the regional context followed the methods used in the memo: Information Request #795 Caribou Displacement and Sukunka Coal Project (https://projects.eao.gov.bc.ca/p/sukunka-coal-mine/docs?folder=109). The regional context was the Bullmoose/Spieker Mountains area, which includes all high elevation range northwest of Wolverine River within the Quintette herd range. This allowed a comparison to be made with the previous calculation of area overlap with the EA boundary buffers.

The telemetry data were provided as an MS Excel file by BC Ministry of Environment and Climate Change Strategy, and comprise locations from VHF and GPS collars on females within the Quintette herd for the date range May 2, 2002 to May 2, 2018.

Figure 1 shows the mine pits, EA boundary, buffers, high elevation winter range (HEWR), high elevation summer range (HESR), and caribou telemetry locations. To illustrate recent caribou use on Bullmoose and Chamberlain mountains, caribou telemetry locations are grouped into ‘historic’ (pre-2015) summer and winter, and ‘recent’ (2015-2018) summer and winter. Summer is April through October and winter is November through March.



Watercourse
Waterbody
Pit 3000m Buffer
Pit 500m Buffer
EA Boundary 3000m Buffer
EA Boundary 500m Buffer
Pit
EA Boundary
Caribou HEWR
Caribou HESR

Recent Caribou Telemetry
Summer 2015-2018
Winter 2015-2018

Historic Caribou Telemetry
Summer 2002-2014
Winter 2002-2014

SUKUNKA COAL MINE PROJECT

PROPOSED SUKUNKA COAL MINE PROJECT IN RELATION TO CARIBOU LOCATIONS AND HIGH ELEVATION RANGE

ENVIRONMENTAL ASSESSMENT OFFICE MEMO

Data Sources: Glencore, Province of British Columbia, Government of Canada
Disclaimer: Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.
File Path: fig_123110482_eao_memo_01_caribou_telemetry

DATE:	05-NOV-18	PROJECTION:	UTM 10	DRAWN BY:	S PARKER
FIGURE ID:	123110482	DATUM:	NAD 83	CHECKED BY:	P HAYWARD

PREPARED BY: Stantec

PREPARED FOR: GLENCORE

FIGURE NO: 1

SUMMARY OF HIGH ELEVATION RANGE OVERLAP

The pit boundary results in a smaller area of overlap with high elevation range compared to the EA boundary, most noticeably for HEWR (Table 1).

Table 1: Summary of Area Overlap of High Elevation Range within 500 m and 3,000 m of the Proposed Sukunka Coal Mine Project

High Elevation Range	Buffer (m)	EA Boundary [1]		Pits Boundary	
		Area (ha)	Proportion of Bullmoose/Spieker Area (%)	Area (ha)	Proportion of Bullmoose/ Spieker Area (%)
High elevation winter range	500	494	1.13	137	0.31
High elevation summer range	500	971	1.76	459	0.83
High elevation winter range	3000	3,328	7.63	2,383	5.46
High elevation summer range	3000	4,185	7.61	3,197	5.81
Note: [1] metrics reported in the memo: Information Request #795 Caribou Displacement and Sukunka Coal Project (https://projects.eao.gov.bc.ca/p/sukunka-coal-mine/docs?folder=109)					

SUMMARY OF TELEMETRY LOCATIONS OVERLAP

The pit boundary results in overlap with fewer caribou telemetry locations compared to the EA boundary, most noticeably in winter (Table 2). There are few telemetry locations within 500 m of the pits or EA boundary, and those that overlap are winter locations pre-2015 (see Figure 1).

Table 2: Summary of Caribou Telemetry Locations, 2002 – 2018

Season	Buffer (m)	EA Boundary [1]		Pits Boundary	
		Count [2]	Proportion of total in Bullmoose/Spieker Area (%)	Count [3]	Proportion of total in Bullmoose/Spieker Area (%)
Winter	500	146	0.64	85	0.38
Summer	500	0	0.00	0	0.00
Winter	3000	2,857	12.61	1,873	8.26
Summer	3000	479	1.64	293	1.00
Note: [1] caribou telemetry data include locations up to May 2, 2018; therefore, numbers differ from that reported in the 2016 memo: Information Request #795 Caribou Displacement and Sukunka Coal Project [2] number of collared caribou in data set: 10 within 500 m and 26 within 3,000 m of the EA boundary [3] number of collared caribou in data set: 4 within 500 m and 20 within 3,000 m of the Pits boundary					

Reference: **Proposed Sukunka Coal Mine Project - Response**

ACTION ITEM # 2

The caribou sub-working group requested Glencore to consider if current pits could be mined underground. Glencore has reviewed the geological modelling for the deposit and has specifically focussed on the open pit that directly overlaps the High Elevation Summer Range, as noted on Figure 2 below.

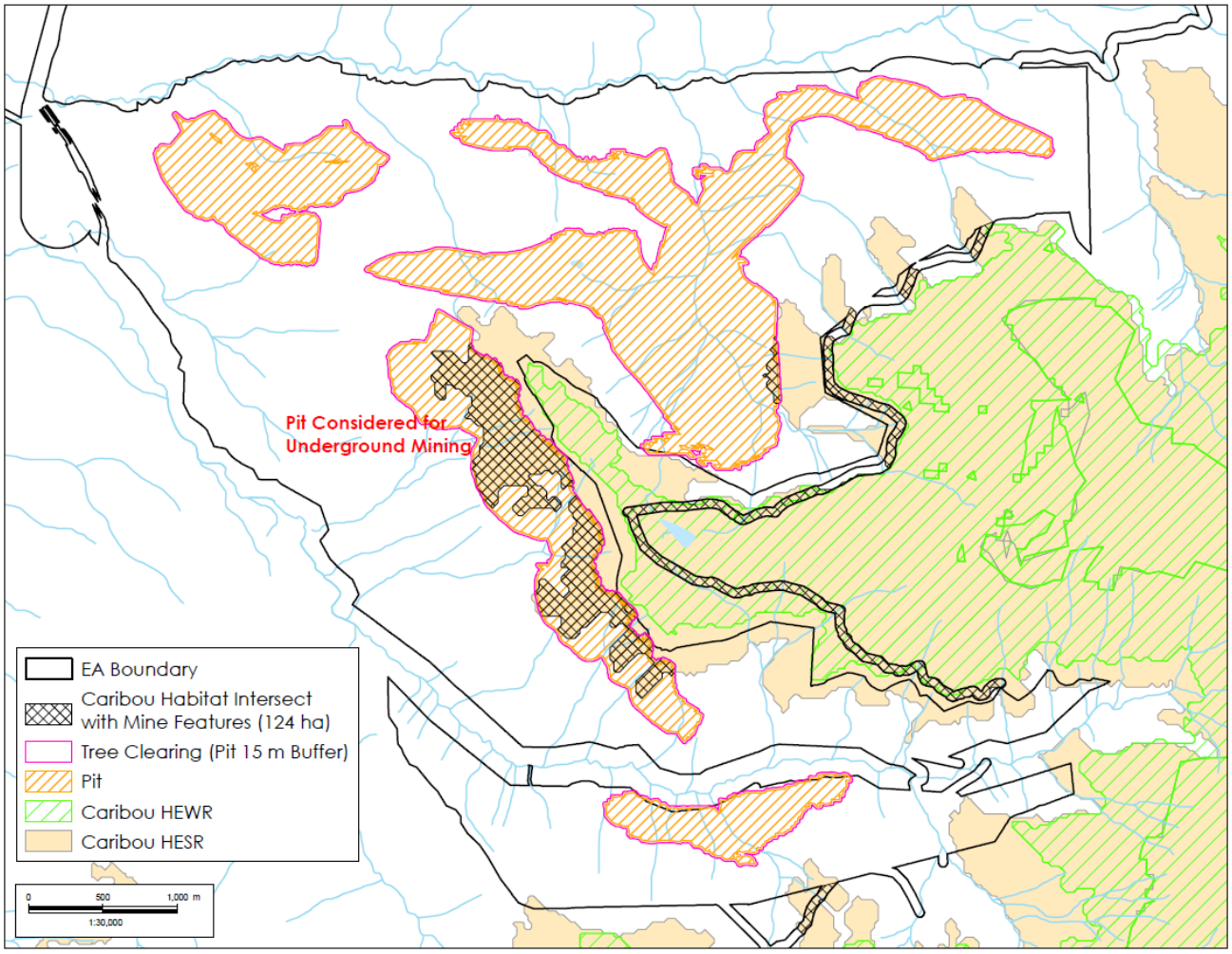


Figure 2: Proposed Sukunka Coal Mine

The open pit highlighted above follows along the topography in the area and the western edge of the pit starts at the outcrop of the coal seams. As a general rule of thumb underground mining is not technically feasible with less than 50 metres Depth of Cover (DOC), and approximately half of the pit has a DOC of less than 50 metres. For the remainder of the pit area, underground mining would be technically feasible, however the available underground area would be further reduced as the coal seams are truncated by a fault that runs parallel to the highwall. For these reasons open cut

Reference: **Proposed Sukunka Coal Mine Project - Response**

extraction is the more efficient (both in terms of resource extraction and economically), and hence preferred, method of mining.

If there are any questions regarding this information, please contact the undersigned.

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