Table 1. Blackwater Gold Project Conformity Review Comments

Federal Impact Statement (EIS) Guidelines		Conformity Review	
ID	**Federal EIS Guideline Requirement Description**	**Comments**	**Proponent Comment**
23	In a summary form identify the regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.	Context: Section 5.4.15 states that none of the invertebrate species present are subject to provincial or federal wildlife regulations. However, the indicator species *Jutta arctic* is selected because it is provincially blue listed. It is also noted that the Red-listed Mandan Skipper and the Blue listed Hagen's blue were encountered, but that their abundance and distribution in central BC is poorly known. Request: Clarify whether provincially-listed species are subject to any regulations.	British Columbia has no stand-alone endangered species legislation. Endangered or at-risk species may be protected under the *Wildlife Act*, *Forest and Range Practices Act*, Identified Wildlife Management Strategy (IWMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and under the federal *Species at Risk Act*. Neither the Mandan Skipper (*Cartercephalus palaemon mandan*) nor the Hagen's Bluet (*Enallagma hageni*) are protected under these acts, conventions or strategies; thus, neither species is subject to any regulations. Note that the Hagen's Bluet was downgraded to yellow-listed on April 29, 2015, indicating that it is apparently secure and not at risk of extinction.
38	A description of the waste rock and overburden storage and stock piles (locations, volumes and development plans; geotechnical conditions, seismicity and design criteria and a description of waste water management components of the project);	Context: The proponent has a clear understanding of the position of the interglacial sediments but there is an error in the description of the interglacial fluvial deposits. Request: A wording correction is required in section 2.2.3.2.1.7 on page 2.2-76: "This layer should be located sequentially ~~overlying~~ underlying the Fraser glacial till, but in most of the drill holes it is absent." Context: Table 2.2.3-14 indicates that all PAG rock will be extracted by the end of the first year of operation; this appears to contradict Table 2.2.3-17 which shows that PAG waste rock will be generated throughout the life of the mine. A description of mine waste water management components was found in Section 2.2.3.5. Colours in legend for Figure 5-5 Appendix 5.1.3.1) do not correspond with colours in figure. Request: Clarify when PAG rock is expected to be generated by the Project and provide an updated Figure 5-5 or legend that correctly identifies the colours presented in the figure.	Request #1) The wording of the sentence in question should read "This layer should be located sequentially overlying the older glacial till deposits, but in most of the drillholes this layer is absent." Request #2) It appears that the information presented in Table 2.2.3-14 of the EIS has been misinterpreted by the reader, which shows that PAG waste rock is extracted between Years -2 and 14 of the mine plan. This is consistent with the summary shown in a different format in Table 2.2.3-17. Table 2.2.3-14 provides additional detail on where the PAG waste rock will be stored, and how that detail is provided in the table may be the source of the confusion. PAG during Years -2 to 1 will be sent to "Site C Storage" and during Years 2 to 13 it will be sent to "Site D Storage". PAG during Year 14 will be "backfilled" into the open pit. Additionally, the variations in color (from light to dark) observed for each of the seven ARD classifications shown in Figures 5.5 result from the 3-D shading used to show the benches and walls in the open it. The same is seen in Figure 5.4: Block Model – ARD Classification of Ultimate Pit Walls. We trust this will clarify the perceived inconsistency without requiring any changes to the document.
48	The scope of project for the purposes of the EA includes the components (section 5.6), physical activities (section 5.7) and federal decisions (section 5.2). The proponent will consider all the components, activities and decisions identified in these sections as part of the effects assessment. Based on information received in the project description from the proponent, the Agency defines the scope of project to be assessed as the construction, operation and decommissioning of the following project components: • Open-pit mine; • Waste rock and overburden dumps (non-acidic and potentially acid-generating); • Construction laydown area; • Sewage water management facility; • Low grade ore stock pile; • Truck shop; • Fuel storage facilities; • Storage of dangerous goods other than oil and gas; • Tailings storage facility • Processing plant facility; • Explosives manufacturing and storage facility; • Construction and operations camps; • Top soil stockpiles; • Core logging area; • Air strip and air transportation service buildings; • Railway line/spur; • Trans-load facility;	Context: The EIS should demonstrate that the federal scope of the Project has been considered in the assessment of the potential effects to the identified Valued Components. The references provided are for documents generated by the Canadian Environmental Assessment Agency, which have been included as Appendices. Request: Provide a list of references in a Table of Concordance that identifies how the federal scope of the Project, as described in the EIS Guidelines, was considered in the assessment of potential effects of the Project on Valued Components	A Table of Concordance for the EIS Guidelines is provided in the Table of Concordance section of the EIS. The scope of the Project is provided in Section 2.2.2.1 of the EIS (Assessed Project) and includes all Project components listed in the EIS Guidelines, with the exception of the railway line/spur and trans-load facility, which ceased to be proposed as a Project component in 2014. As described in Table 4.3-1 in Chapter 4 (Assessment Methodology) of the EIS, these Project components were assessed against the Project VCs in the corresponding EIS section and figure (presented as VC: EIS section reference; EIS figure reference): • Noise and vibration: Section 5.1.1; Figure 5.1.1.3-1 • Air quality: Section 5.1.1; Figure 5.1.1.1-1 • Climate change: Section 5.1.1; Figure 5.1.1.1-1 • Surface water flow: Section 5.1.2; Figure 5.1.2.1-1 • Surface water quality: Section 5.1.2; Figure 5.1.2.1-1 • Sediment quality: Section 5.1.2; Figure 5.1.2.1-1 • Wetlands: Section 5.1.2; Figure 5.1.2.1-1 • Fish and fish habitat: Section 5.1.2; Figure 5.1.2.1-1 • Groundwater quantity: Section 5.1.2; Figure 5.1.2.3-1 • Groundwater quality: Section 5.1.2; Figure 5.1.2.3-1 • Physiography and topography: Section 5.1.3; Figure 5.1.3.2-1 • Surficial geology and soil cover: Section 5.1.3; Figure 5.1.3.2-1 • Soil quality: Section 5.1.3; Figure 5.1.3.2-1 • Ecosystem composition: Section 5.1.3; Figure 5.1.3.2-1 • Plant species and ecosystems at risk: Section 5.1.3; Figure 5.1.3.2-1 • Amphibians: Section 5.1.3; Figure 5.1.3.4-1 • Water birds: Section 5.1.3; Figure 5.1.3.4-1

Table 1. Blackwater Gold Project Conformity Review Comments

Federal Impact Statement (EIS) Guidelines		Conformity Review	
ID	**Federal EIS Guideline Requirement Description**	**Comments**	**Proponent Comment**
48 *(cont'd)*	• Water supply intake, pump stations, pipeline and associated access roads; • Temporary or permanent water diversions; • Waste storage and disposal (hazardous and non-hazardous); • Sedimentation/settling ponds; • Power generator; • Transmission line and right of way and associated access roads; • Temporary access roads during construction; and, • Mine access road.		• Forest and grassland birds: Section 5.1.3; Figure 5.1.3.4-1 • Moose: Section 5.1.3; Figure 5.1.3.4-1 • Caribou: Section 5.1.3; Figure 5.1.3.4-1 • Grizzly bear: Section 5.1.3; Figure 5.1.3.4-1 • Furbearers: Section 5.1.3; Figure 5.1.3.4-1 • Bats: Section 5.1.3; Figure 5.1.3.4-1 • Invertebrates: Section 5.1.3; Figure 5.1.3.4-1 • Provincial economy: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Regional and local employment and businesses: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Regional and local government finance: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Demographics: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Regional and community infrastructure: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Regional and local services: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Family and community well being: Sections 6 & 7; Figures 6.1.1-1 & 7.1.1-1 • Non-traditional land and resource use: Section 7.1; Figure 7.1.1-1 • Current land and resource use for traditional purposes: Section 7.1; Figure 7.1.1-1 • Visual resources: Section 7.1; Figure 7.1.1-1 • Archaeological sites: Section 8.1; Figure 8.1-1 • Historic heritage sites: Section 8.1; Figure 8.1-1 • Paleontological resources: Section 8.1; Figure 8.1-1 • Environmental exposures: Section 9.1; Figure 9.1-1 • Workers health and safety: Section 9.1; Figure 9.1-1
52	The geographical and temporal boundaries for the assessment of malfunctions and accidents may be different than those in the scope of factors for each VC. This will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events.	Context: Section 10.7.1.2 states that the accidents and malfunctions risk assessment spatial boundary corresponds with the spatial boundary for "terrestrial valued components". The boundaries for the terrestrial valued components vary with each individual VC. Request: Provide a map or reference to the specific spatial boundary considered for the accidents and malfunctions risk assessment	The spatial boundary for the accidents and malfunctions risk assessment corresponds to the regional study area (RSA) for the terrestrial ecosystems VCs (specifically the ecosystems composition VC and the plants and ecosystems at risk VC). The RSA encompasses the Project mine site plus the area contained within a 3 km distance in all directions from the Project mine site boundary. Additionally, the RSA encompasses the portions of the transmission line, mine access road, airstrip, freshwater supply pipeline and Kluskus Forest Service Road that are not included in the Project mine site (and buffer) plus the area contained within a 500 m distance in all directions from these feature portions.
74	The proponent will summarize all pertinent historical information on the size and geographic extent of relevant animal populations as well as density, based on best available information.	Context: The SARA status for Short- eared Owl appears to be incorrect. Request: Update the federal status for the bird to Schedule 1 (listed) Special Concern.	The SARA status for the Short-eared Owl is updated to be Schedule 1 (listed) - Special Concern.
133	The EIS will illustrate, on a topographic scale map, the hydrographic network (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands. It will also indicate the boundaries of the watershed and subwatersheds of the study area. Emphasis will be placed on the watercourses and water bodies likely to be affected by the project and their physical characteristics, water quality and hydrological regime. Hence, for all the watercourses and water bodies on which effects are anticipated, the EIS will describe the biophysical characteristics, including: • For each watercourse, indicate the name of the watercourse and provide a description of the habitat by homogeneous section. The parameters that must be determined are length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, including bank slopes. It is recommended that photos be attached to the description;	Context: The reviewer was unable to find maps of flood risk areas in this section. Request: Please provide maps of flood risk areas, or a reference to where they may be found.	Refer to the attached memo 'Blackwater Gold Project – EA Application/EIS Review – Federal Conformity Review ID #133'.

Table 1. Blackwater Gold Project Conformity Review Comments

Federal Impact Statement (EIS) Guidelines		Conformity Review	
ID	**Federal EIS Guideline Requirement Description**	**Comments**	**Proponent Comment**
145	Existing data will be supplemented by surveys, where necessary. Surveys should be designed with reference to the Canadian Wildlife Service's guidance such as Technical Report No. 508, A Framework for the Scientific Assessment of Potential Project Impacts, on Birds (Hanson et al. 2010). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impact on migratory birds.	Context: Surveys do not reference the Canadian Wildlife Service's guidance pieces listed in the EIS guidelines. Surveys were carried out as recommended by the Resource Inventory Standards Committee. Request: Please indicate how surveys meet or exceed the requirements of the Canadian Wildlife Services guidance	Refer to the attached memo Blackwater Gold Project - Federal Conformity Review Comments from Canadian Environmental Assessment Agency (CEA Agency) – Table 1, ID #145.
193	VCs suggested for inclusion in the EIS by Aboriginal groups, whether or not those factors were included, and the rationale for any exclusions	Context: The proponent references Section 7.2.7 in the Table of Concordance. This section is an assessment of the current use of lands and resources by Aboriginal people, and does not mention VCs suggested for inclusion by Aboriginal groups. Request: Identify whether Aboriginal groups suggested VCs for inclusion, and the rationale for any exclusions.	Throughout consultation and Working Group processes that included Aboriginal group participation, Aboriginal groups participated in the identification and selection of candidate Valued Components. Appendix 3.1.3A_AIR Tracking Tables provides a detailed list of comments received by Aboriginal groups and New Gold's response. Comments on VC include, but are not limited to: • in May 2013, Saik'uz First Nation (SFN) suggested that medical plants in the area be included; this was included in the assessment of Ecosystem Composition. • in October 2013, Lhoosk'uz Dene Nation (LDN) indicated the need to include other furbearing mammals of importance to trappers; the Proponent added beaver as an indicator for furbearers. • in October 2013, LDN suggested four VCs: (1) Harvesting, (2) Governance/Stewardship, (3) Cultural Identity and (4) Sacred Places; the Proponent considered these suggestions in the following ways: creation of a new VC "Cultural Land and Resource Use for Traditional Purposes" to address harvesting and sacred places. Cultural identity and governance/stewardship are not proposed to be included in the effects assessment although some baseline information is presented in Section 14. These pertain to broad concepts and to accurately assess effects, specific concerns would need to be identified and a valid link to the project demonstrated. New Gold will continue to work with LDN to identify specific concerns and develop approaches to mitigate those concerns. • in October 2013, LDN expressed concern that only plants listed as species at risk were addressed by the Ecosystem VC; the Proponent included berry-producing plants to represent traditional use plants. • in November 2013, SFN suggested the inclusion of a traditional land use VC. This was incorporated by the Proponent (i.e., inclusion of the VC "Current Land and Resource Use for Traditional Purposes"). • in June 2013, Ulkatcho First Nation (UFN) suggested the inclusion of wolf and whitefish as indicator species; the Proponent indicated that the moose and caribou VCs include discussion of predator-prey relationships that will address wolf and that mountain whitefish was intentionally not included because information to date through consultation, interviews and community meetings since 2011 has not indicated current harvesting of mountain whitefish in the aquatics study area. • in July 2015, Stellat'en First Nation (StFN) provided the Stellat'en Socio-economic Baseline Report (Firelight Group, 2015), which includes a table of priority valued components of the StFN. The StFN VCs were identified through community discussions and meetings, and were subsequently prioritized by voting. The prioritized VCs were cross referenced against the findings of a distinct community survey. StFN indicate that there is divergence between the VCs identified by the community and the VCs identified by the Proponent, "likely [as] a reflection of fundamentally different values and world views, which would need to be taken into account and reconciled by both parties moving forward" (Firelight Group 2015: 32). The Stellat'en Socio-economic Baseline Report is listed as a confidential report and therefore the specific VCs are not described.

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MEMORANDUM

To:	Mr. Timothy Bekhuys	Date:	January 11, 2016
Copy To:	Ryan Todd, Nigel Fisher, Nicole Bishop	File No.:	VA101-00457/19-A.01
From:	Daniel Fontaine	Cont. No.:	VA16-00025
Re:	Blackwater Gold Project - EA Application/EIS Review - Federal Conformity Review ID#133		

INTRODUCTION

This memorandum responds to comments provided by the Canadian Environmental Assessment Agency (CEAA) on December 31, 2015 with respect to the New Gold Inc. (New Gold) Environmental Impact Statement (EIS). The comment was received as part of the Federal Conformity Review and a response is provided below.

CEAA COMMENT

Comment ID#133 was provided to New Gold as follows:

Context: The reviewer was unable to find maps of flood risk areas in this section.

Request: Please provide maps of flood risk areas, or a reference to where they may be found.

NEW GOLD REPONSE

Two flood risk maps are attached to this response. The maps were produced at a regional topographic scale using the available Light Detection and Ranging (LiDAR) topographic mapping for the area downstream of the proposed mine facilities. The mine facilities are located primarily within the upper Davidson Creek watershed with some components in adjacent watersheds; Creek 661 (camp, East Dump, part of the open pit), Turtle Creek (airstrip and access road), Chedakuz Creek and Tatelkuz Lake (fresh water intake). Therefore the flood risk areas modelled reflect the area potentially affected by the Project.

The maps were developed using a two-dimensional hydrodynamic model, FLO-2D, which is capable of simulating two-dimensional flow over a floodplain. The maps considered two natural flood scenarios; a 100 year return period flood event and the Probable Maximum Flood (PMF). Peak flows for these natural flood scenarios were determined using the recommended regional peak flow relationships and extreme precipitation estimates developed in the 2013 Hydrometeorology Report (EIS Appendix 5.1.1.1A). These scenarios were selected because they represent the likely maximum extent of areas prone to flood risk.

Prepared: _____
Daniel Fontaine, P.Eng. – Senior Engineer

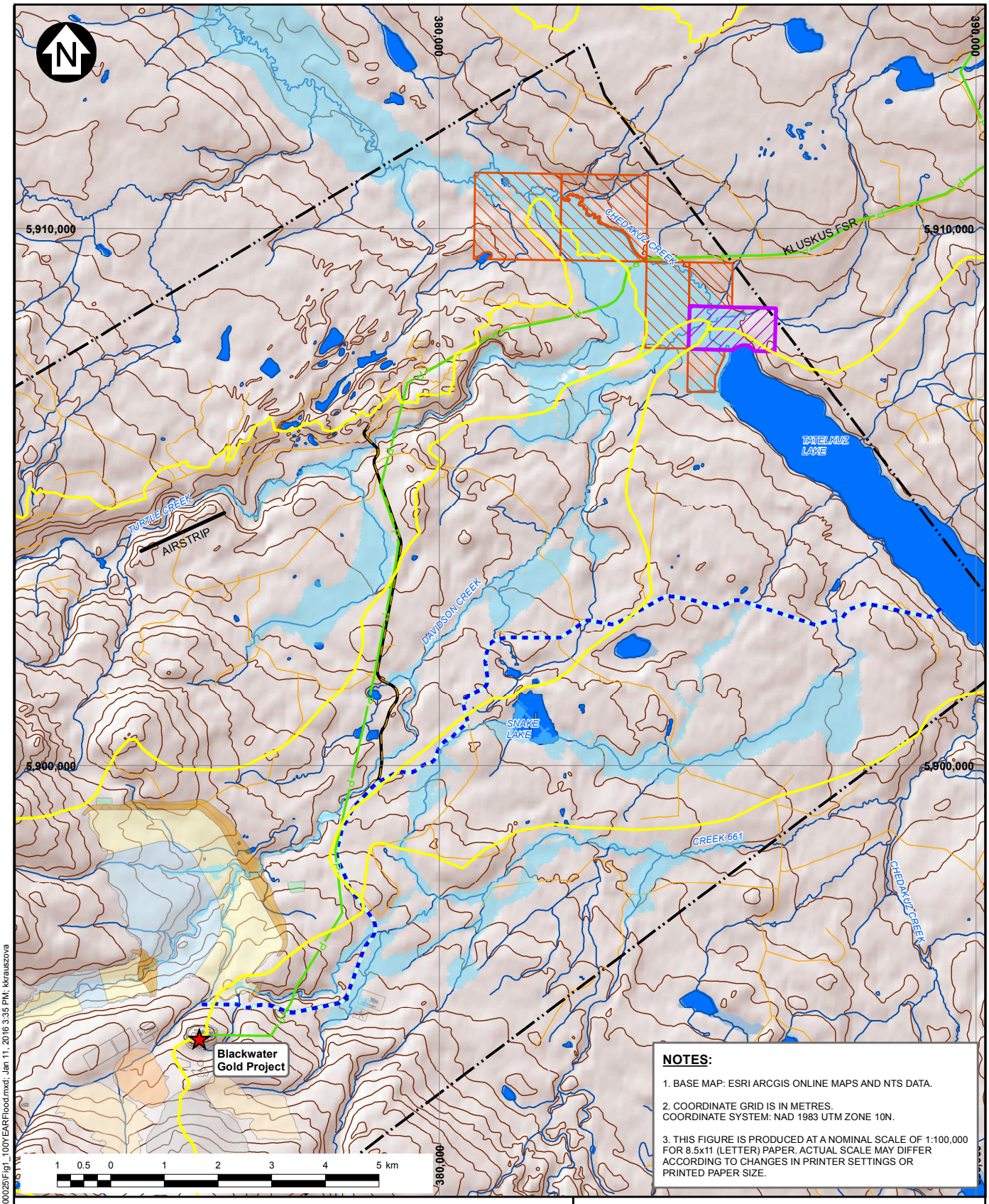
Reviewed: _____
Violeta Martin, Ph.D., P.Eng. – Senior Hydrotechnical Engineer

Approval that this document adheres to Knight Piésold Quality Systems: ☐

Attachments:

Figure 1 Rev 0 100 Year Flood Inundation Map

Figure 2 Rev 0 Probable Maximum Flood (PMF) Inundation Map



NOTES:

1. BASE MAP: ESRI ARCGIS ONLINE MAPS AND NTS DATA.

2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.

3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:100,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

LEGEND:

GENERAL

- PROJECT LOCATION
- EXISTING ROAD
- CONTOUR 100 FT
- RIVER/CREEK
- LAKE
- CATCHMENT BOUNDARY
- MAX WATER ELEVATION 100 YEAR FLOOD
- FIRST NATIONS RESERVE
- PRIVATE LAND
- LIDAR - NTS DIVIDE

PROPOSED MINE SITE FACILITIES

- ACCESS ROAD
- TRANSMISSION LINE
- WATER SUPPLY PIPELINE
- AIRSTRIP

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	11JAN'16	ISSUED WITH MEMO	DDF	KK	VM

NEW GOLD INC.

BLACKWATER GOLD PROJECT

100 YEAR FLOOD INUNDATION MAP

Knight Piésold CONSULTING

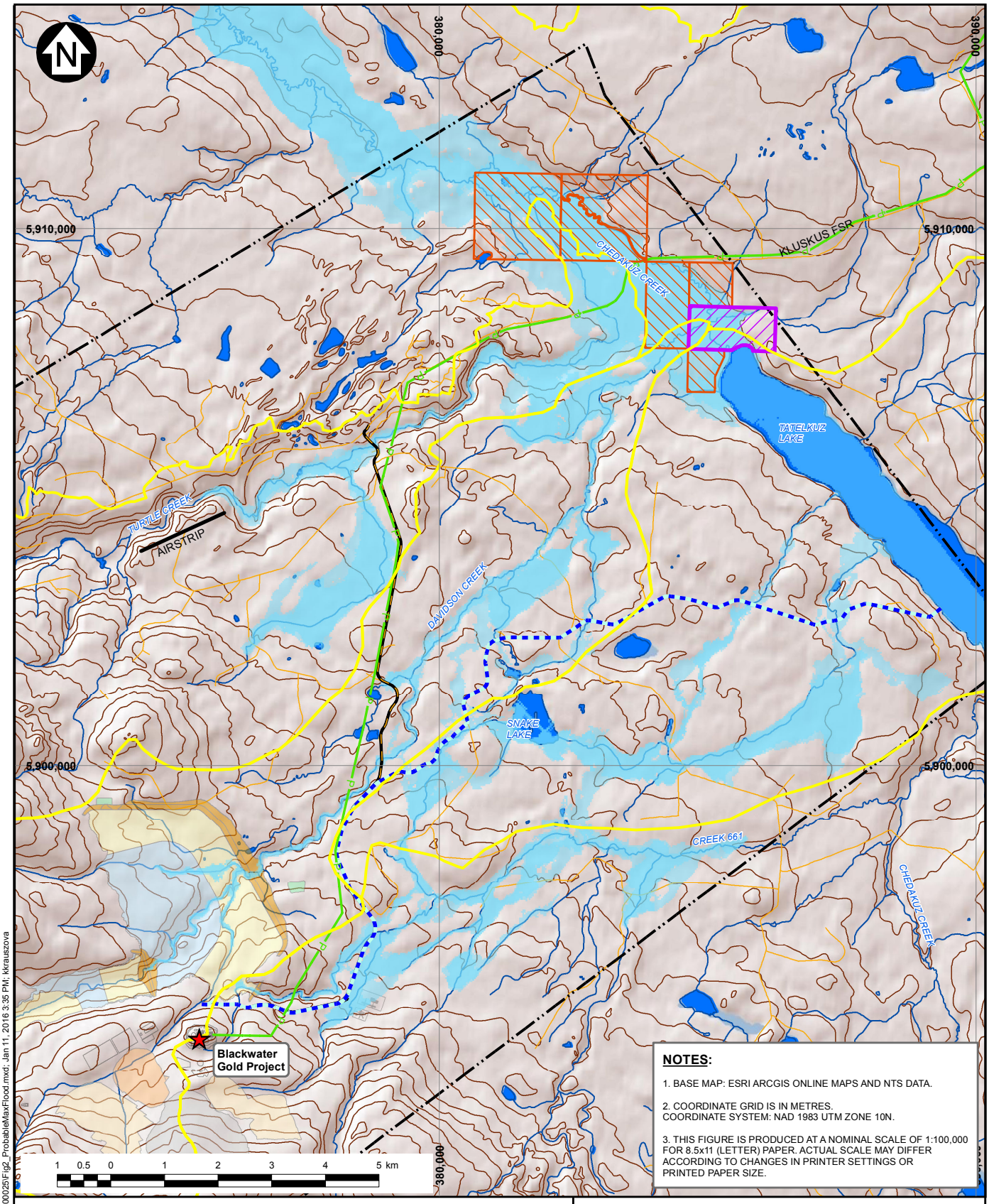
P/A NO. VA101-457/19

REF NO. VA16-00025

FIGURE 1

REV 0

SAVED: M:\101\00457\19\A\GIS\Figs\VA16-00025Fig1_100YEARFlood.mxd: Jan 11, 2016 3:35 PM; kkrauszova



NOTES:

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LEGEND:

GENERAL

- PROJECT LOCATION
- EXISTING ROAD
- CONTOUR 100 FT
- RIVER/CREEK
- LAKE
- CATCHMENT BOUNDARY
- MAX WATER ELEVATION PMF
- FIRST NATIONS RESERVE
- PRIVATE LAND
- LIDAR - NTS DIVIDE

PROPOSED MINE SITE FACILITIES

- ACCESS ROAD
- TRANSMISSION LINE
- WATER SUPPLY PIPELINE
- AIRSTRIP

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	11JAN'16	ISSUED WITH MEMO	DDF	KK	VM

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PROBABLE MAXIMUM FLOOD (PMF) INUNDATION MAP

Knight Piésold CONSULTING

P/A NO. VA101-457/19

REF NO. VA16-00025

FIGURE 2

REV 0

SAVED: M:\101\00457\19\A\GIS\Figs\VA16-00025Fig2_ProbableMaxFlood.mxd; Jan 11, 2016 3:35 PM; kkrauszova

Memorandum

Date: 12 January 2016

To: Tim Bekhuys, New Gold Inc.

From: Sean Sharpe, Amec Foster Wheeler

CC: Ryan Todd, New Gold Inc., Nicole Bishop, ERM, Dan Begley, Amec Foster Wheeler, Kathrin Kunzmann, Amec Foster Wheeler

Ref: VE52505.3000.01

Re: Blackwater Gold Project - Federal Conformity Review Comments from Canadian Environmental Assessment Agency (CEA Agency) – Table 1, ID #145

1.0 INTRODUCTION

This memorandum responds to comments provided by the Canadian Environmental Assessment Agency (CEAA) during the Federal Conformity Review of the New Gold Inc. (New Gold) Environmental Impact Statement (EIS) on the Blackwater Gold Project (the Project). The original comment is provided below in **Table 1-1** followed by the response.

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amecfw.com

Table 1-1: Blackwater Gold Project – Federal Conformity Review Comment – Table 1 – ID #145

Federal Impact Statement (EIS) Guidelines		Environmental Impact Statement			Conformity Review
ID	**Federal EIS Guideline Requirement Description**	**Section**	**Section Title**	**Other Documentation (Tables, Figures, Appendices etc.)**	**Comments**
145	Existing data will be supplemented by surveys, where necessary. Surveys should be designed with reference to the Canadian Wildlife Service's guidance such as Technical Report No. 508, A Framework for the Scientific Assessment of Potential Project Impacts, on Birds (Hanson et al. 2010). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impact on migratory birds.	5.1.3.4	Wildlife and Wildlife Habitat	Baseline Report (AMEC E&I) (App Volume 15)	Context: Surveys do not reference the Canadian Wildlife Service's guidance pieces listed in the EIS guidelines. Surveys were carried out as recommended by the Resource Inventory Standards Committee. Request: Please indicate how surveys meet or exceed the requirements of the Canadian Wildlife Services guidance

2.0 RESPONSE:

The equivalency of methodology to the Federal Impact Statement Guidelines for each of the federally and provincially listed species of birds potentially occurring and recorded in the biogeoclimatic (BGC) zones within the proposed Project Local Study Areas (LSA) and Regional Study Areas (RSA) are provided in **Table 2-1** below.

CEAA requested that Hanson *et al*., 2010 be referenced for examples of project types and recommended techniques for assessing impact on migratory birds; however, the correct reference is Hanson *et al*., 2009.

Table 2-1: Federally and Provincially Listed Species Potentially Occurring and Recorded Presence in the Biogeoclimatic Zones within the Proposed Project LSAs and RSAs for the Proposed Blackwater Project

Common Name	Latin Name	COSEWIC Status	*SARA* Status	Provincial Status	BC Provincial RISC methodology used for surveys and future inventory	Federal Impact Statement (EIS) Guidelines Equivalency of Methodology
Olive-sided flycatcher	*Contopus cooperi*	Threatened	Threatened	Blue	Yes	Yes – point count surveys and habitat suitability modelling
Rusty blackbird	*Euphagus carolinus*	Special Concern	Special Concern	Blue	Yes	Yes – point count surveys and wetland waterbird surveys
Barn swallow	*Hirundo rustica*	Threatened	N/A	Blue	Yes	Yes – point count surveys
Common nighthawk	*Chordeiles minor*	Threatened	Threatened	Yellow	Yes	Yes – point count surveys and dusk acoustic/observational surveys
Sharp-tailed grouse *columbianus* subspecies	*Tympanuchus phasianellus columbianus*	N/A	N/A	Blue	Yes	Yes - point count surveys and lek surveys
Short-eared owl	*Asio flammeus*	Special Concern	Special Concern	Blue	Yes	Yes – call playback surveys and stand watch surveys
Northern goshawk	*Accipiter gentilis*	N/A	N/A	Yellow	Yes	Yes – call playback surveys
Great blue heron	*Ardea herodias herodia*	N/A	N/A	Blue	Yes	Yes – point count and waterbird surveys
Long-billed curlew	*Numenius americanus*	Special Concern	Special Concern	Blue	Yes	Yes – point count and waterbird surveys
American bittern	*Botaurus lentiginosus*	N/A	N/A	Blue	Yes	Yes – point count and waterbird surveys, including acoustic surveys
American golden plover	*Pluvialis dominica*	N/A	N/A	Blue	Yes	Yes - point count surveys
Horned grebe	*Podiceps auritus*	Special Concern	N/A	Yellow	Yes	Yes – point count and waterbird surveys habitat suitability modelling
Yellow rail	*Coturnicops noveboracensis*	Special Concern	Special Concern	Red	Yes	Yes – point count and waterbird surveys including acoustic surveys and habitat suitability modelling

Notes: COSEWIC - Committee on the Status of Endangered Wildlife in Canada
EIS – Environmental Impact Statement;
RISC - Resources Information Standards Committee;
SARA – Species at Risk Act

According to the EIS guidance document (CEAA, 2013) on inventory methodology for Birds, Wildlife and their Habitat, the EIS will describe migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other landbirds), ungulates, furbearers, amphibians, small mammals, and their habitat at the Project site and within the local and regional areas. The results of any baseline surveys and a description of the methodology will be included. This was provided in detail in the Baseline Report.

Migratory birds are protected under the *Migratory Birds Convention Act* and associated regulations. Preliminary data from existing sources were gathered on year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, and fall migration). In addition to information obtained from naturalists, other relevant datasets were consulted. Existing data were supplemented by surveys, where necessary. CEAA (2013) recommended that surveys should be designed with reference to the Canadian Wildlife Service's (CWS) guidance such as Hanson *et al*. (2009). Appendix 3 of Hanson *et al* 2009 provides examples of project types and recommended techniques for assessing impacts on migratory birds.

The survey methods are outlined in the Baseline Report; although specific reference was not made to Hanson *et al*. (2009), they meet or exceed the CWS methods and principles referenced. The BC Resources Information Standards Committee (RISC) survey methodologies were designed by species group experts to incorporate the scientific principles and considerations including those discussed in the Environment Canada guidance document. BC RISC survey methodologies are recognized as dynamic and comprehensive standardized scientific survey and data protocols that have been adopted by many jurisdictions for baseline surveys for the purposes of supporting environmental impact assessments within BC and other Provinces and Territories. Further details can be provided, and further discussion with the reviewer can be conducted if required.

Other wildlife and their habitat that could be impacted by Project activities were characterized using existing data, supplemented by surveys as appropriate. The EIS gives particular consideration to areas of concentration of migratory animals, such as breeding, denning, and/or wintering areas; as well as breeding areas of species low in number and high in the food chain (e.g., furbearers such as black bear and wolf). The Baseline Report and EIS specifically addressed surveys and relevant habitat modelling for amphibians, caribou, moose, grizzly bear, furbearers, and bats.

The description of the existing environment included consideration of existing or proposed protected areas, special management areas, and conservation areas in the Regional Study Area (RSA). The Baseline Report includes consideration of special management areas identified in the Vanderhoof Land and Resource Management Plan and provincially protected areas.

Species at Risk and Species of Conservation Concern were addressed by the Baseline Report and EIS. As background for the analysis of the Project's effects on Species at Risk (SAR), the EIS:

- Identified all SARs that may be affected by the Project, using existing data and literature as well as surveys to provide current field data, as appropriate;
- Provided assessments of regional importance, abundance, and distribution that optimized the ability to detect all SARs and sufficient survey effort to obtain comprehensive coverage; and
- Identified residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of SARs that may occur in the Project area, or may be affected by the Project.

The following information sources on species at risk and species of conservation concern were consulted:

- *Species at Risk Act (SARA)* (www.sararegistry.gc.ca);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Relevant Government agencies;
- Local naturalist and interest groups; and
- Aboriginal groups and First Nations.

The Baseline Report literature reviews for wildlife determined the habitats present in the study area (LSA and RSA), applicable regulations and guidelines, potential presence of wildlife species in general, and rare or threatened wildlife species of conservational concern (referred to as species at risk), in particular, as listed by:

- COSEWIC (January 2012);
- Schedule 1 of the federal *SARA* (Government of Canada 2003);
- BC Conservation Status Centre (BC CDC) on its Red and Blue lists; and
- BC CDC's Animal Tracking List for the VFD (January 2012).

The background review included identifying species at risk that were documented as occurring or potentially occurring within the RSA. Other wildlife species identified from the background searches were recorded to create a comprehensive list of species that may occur within the study area. As part of the literature review process, life history accounts were developed for species at risk or management concern in the RSA, and can be found in the beginning of the results section for each species group (i.e., birds, mammals, etc.). The following sections identify the species group surveys undertaken and how they meet or exceed the CEAA guidelines recommended for the EIS (CEAA, 2013).

2.1 Forest and Grassland Songbird Surveys

To determine the terrestrial bird species presence, abundance, richness, and diversity within the study area, methods followed the variable radius point count (PC) protocol described in the Inventory Methods for Forest and Grassland Songbirds (RISC, 1999a), which enables identification of a wide range of bird species along transects (Ralph *et al*., 1995). Surveys were conducted during the breeding season window of 1 June to 15 July (Campbell *et al*., 2001), began 0.5 hours before sunrise, and ended no later than 4.5 hours after sunrise. The surveys were not conducted when wind speed exceeded approximately 20 kilometres per hour (km/hr; >4 on the Beaufort scale) or during rain or snow storms. Transects were placed within the different representative BGC zones present in the LSA.

During the PC surveys, all birds seen or heard during each five-minute count period that were within 200 metres (m) of the PC station were identified and recorded, and those detected further than 200 m, between stations, or before/after the count period were recorded as incidental sightings. Data collected at each station included weather conditions, species, number of individuals, sex, age, distance, and direction of each detection. In addition, terrestrial birds detected during other surveys were also recorded as incidental observations.

Species accumulation curves were calculated to provide information on the number of species recorded for an area relative to the effort needed. Typically, once an asymptote in a graph is approached, the majority of species present within an area are believed to have been identified.

Calculations of diversity and equitability were only made if most of the species in the different study areas were detected.

As outlined in Hanson *et al*. (2009), open pit mining, roads, transmission lines, and airstrips may impact bird groups including forest and grassland passerines and raptors through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variables considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following the RISC standards cited meet or exceed the CWS guidance in Hanson et al., 2009 as they employ habitat classification and selection of representative patches of habitat for forest and grassland bird groups, variable centred point counts, and habitat loss defined as:

Equation 1: *(Bird Density) (Area Loss of Effective Habitat) = Loss*

Nest searches are recommended as the primary approach to pre-clearing and pre-construction surveys if clearing is occurring during breeding seasons. Consistent with Hanson *et al*. (2009) and RISC (1999a), each breeding bird variable point count survey station was placed, to the extent possible, in contiguous patches of habitat to examine similarities or differences in abundance and species richness across ecological communities.

Preliminary data from existing sources were gathered on year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration), including information obtained from naturalists and other relevant datasets. Existing data were supplemented by surveys, designed consistent with the CWS guidance in Hanson *et al*. (2009). Appendix 3 of the Hanson *et al*. (2009) provides examples of project types and recommended techniques for assessing impacts on migratory birds, which are equivalent to BC RISC standards for surveys used for the baseline studies. RISC standard variable radius point breeding bird surveys meet or exceed the CWS guidance in Hanson *et al.*, 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.2 Common Nighthawk Surveys

The common nighthawk surveys conducted at dusk, used to determine presence/non-detection, also used PC stations and followed the methodology specified in the RISC standards for Inventorying Nighthawks and Poorwills (RISC, 1998). The methods are similar to those used for the breeding bird surveys; however, the surveys were timed to coincide with peak nighthawk activity around dusk. Surveys started at sunset and after a one-minute quiet period all birds were then recorded for a five-minute period. Surveys were continued for an hour to remain within the crepuscular survey period, which is defined as being primarily during twilight, and includes dawn and dusk.

As outlined in Hanson *et al.* (2009), open pit mining, roads, transmission lines, and airstrips may impact nighthawks through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variables considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited exceed the guidance in Hanson *et al*. (2009) as they employ habitat classification and selection of representative patches of habitat, variable centred point counts,

and habitat loss defined as by **Equation 1**, based on species-specific methods to detect nighthawks. Nest searches and site specific follow-up dusk surveys are recommended as the primary approach to pre-clearing and pre-construction surveys if clearing is occurring during breeding seasons. RISC standard variable radius point nighthawk surveys exceed the CWS guidance in Hanson *et al*. 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.3 Clark's Nutcracker Survey

Transect surveys followed the methodology in the draft protocol for monitoring Clark's Nutcracker populations as described by Tomback (2005). Transects were walked in late July when nutcrackers have moved to subalpine elevations, and repeated during late August or early September when whitebark pine cones are typically ripe. Following this protocol along each transect, nutcracker sightings were counted at every 250 m. Every bird observed was noted, regardless of distance, as well as its location and its activity (flying, on tree branch, on cone, taking seeds, etc.). The methods include noting tree cone use along fixed points on transects. Surveys began one hour after sunrise.

As outlined in Hanson *et al*. (2009), open pit mining, roads, transmission lines, and airstrips may impact bird groups including nutcrackers through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variable considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited exceed the intent of Hanson *et al*. (2009) as they employ species-specific survey methods, habitat classification and selection of representative patches of habitat, variable centred point counts and habitat loss defined by **Equation 1**. Nest searches are recommended as the primary approach to pre-clearing and pre-construction surveys if clearing is occurring during breeding seasons. Due to the close habitat association between Clark's Nutcracker and Whitebark pine ecosystems, specific methodologies linked to that ecosystem allow reliable assessment of potential impacts from habitat loss. RISC standard variable radius point breeding bird surveys modified for Clark's nutcracker exceed the CWS guidance in Hanson *et al*., 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.4 Sharp-Tailed Grouse Lek Survey

Inventory studies of sharp-tailed grouse were designed to identify the location of individual leks where individual grouse could be counted. Studies followed the RISC Standardized Methodologies for Components of British Columbia Biodiversity: Upland Game Birds Grouse, Quail, and Columbids (RISC, 1997). Leks can be revisited in subsequent years to track population trends (RISC, 1997). To search for leks, PC stations were conducted in areas that best matched habitat requirements using

the RISC standards for sharp-tailed grouse as a guideline (RISC, 1997). Potential habitat is considered to be large (500 m width) young cut blocks with the regeneration reaching less than full canopy closure. One of the main management considerations for maintaining sharp-tailed grouse habitat is to prevent forest encroachment (Ritcey and Jury, 2004).

Surveys occurred from 0.5 hours before sunrise to two hours after sunrise. At each site, a cool down period of two minutes was followed by the recommended three minutes of listening time for a total of five minutes at each survey site. If grouse calls were detected, a search on foot would follow to locate the potential lek site. Sharp-tailed grouse surveys were conducted according to RISC methodology; however, additional surveys were conducted outside of the expected season and timing windows to determine the presence across the landscape. In areas of continuous potential habitat, an interstation distance of 800 m was used.

As outlined in Hanson *et al*. (2009), open pit mining, roads, transmission lines, and airstrips may impact bird groups including sharp-tailed grouse through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variables considered were number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited exceed the methods of Hanson *et al*. (2009) as they employ species-specific methods, habitat classification and selection of representative patches of habitat, variable centred point counts and habitat loss defined by **Equation 1**. Lek surveys are recommended as the primary approach to pre-clearing and pre-construction surveys if clearing is occurring during breeding seasons. RISC standard lek surveys exceed the CWS guidance in Hanson *et al*., 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.5 Raptors

Raptors include both diurnal birds of prey and owls. Due to differences in their behaviour, separate surveys were conducted during the day and night for diurnal and nocturnal raptors, respectively, as indicated in the RISC Inventory Methods for Raptors (RISC, 2001). Due to heavy timber harvest in sections of the LSA, surveying effort for raptors during the breeding season focused on forested areas, which provide breeding habitat for most species present. Incidental observations of raptors and raptor nests were recorded throughout the LSA during all surveys.

Some species, such as the red-tailed hawk (*Buteo jamaicensis*), are often seen soaring over open fields or cutblocks. Others tend to be cryptic in nature and are more difficult to detect reliably. Inconspicuous raptors were targeted for inventory purposes using call payback survey (CPS), while the other raptors were detected with more passive methods such as stand watches.

CPS for raptors used an interstation distance of 400 m for the first shift of surveys; this was increased to 800 m in final surveys to allow greater area to be covered within the restricted time. Calls were played on a Johnny Stewart Wildlife Caller. The caller volume was set to a level that ensured distortion did not affect the calls; the caller speaker was rotated during each species call such that each call was broadcast through 360 degrees.

Recordings of northern saw-whet owl, boreal owl, long-eared owl, barred owl, and great horned owl were used for nocturnal raptor surveys, and merlin, sharp-shinned hawk, Cooper's hawk, northern goshawk, and great horned owl calls were used for the diurnal raptor surveys (RISC, 2001). A total of 15 minutes was spent at each survey station. This consisted of a two-minute silent period before commencing with a 20-second broadcast of the first raptor species, a 30-second silent period, a second 20-second call broadcast, followed by one-minute of silence before broadcasting the next species. At the end of the survey, a two-minute silent period was used to detect additional raptors. For both groups, species calls were played in order from the smallest to the largest species to minimize the chance of small owls being silenced by the call playback of a larger species that could be a potential predator. Surveys took place during the breeding season for the species involved, and avoided inclement weather.

For any response, the time, species, sex, age, and type of response (visual/aural) was recorded. In addition, the estimation of initial distance and direction to the bird from the CPS station, and direction of departure (if a bird was observed) were recorded as these provide clues to the proximity and direction of a nest.

Stand watch surveys were used for both nocturnal and diurnal raptors, but specifically at dusk and dawn to survey for short-eared owls, whereas diurnal surveys were used to monitor all diurnal species during daylight hours. Stand watches took place in open wetlands or areas with views overlooking mature forest, and included a 10 to 15-minute passive count where all raptors detected and weather conditions were recorded.

Roadside surveys were used in conjunction with CPS to survey for diurnal raptors. As ground was covered by vehicle or foot between the areas surveyed, surveyors were constantly vigilant for conspicuous raptors. Driving speed was kept slow during the survey to facilitate detections.

As outlined in Hanson *et al.* (2009), open pit mining, roads, transmission lines, and airstrips may impact bird groups including passerines, waterbirds and raptors through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variables considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited exceed the CWS guidance in Hanson *et al*. (2009) as they employ species-specific methodologies, habitat classification and selection of representative patches of habitat, variable centred point counts and habitat loss defined by **Equation 1**. RISC standard variable radius point breeding bird surveys and playback surveys exceed the CWS guidance in Hanson *et al*., 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.6 Wetland or Waterbirds

Wetland birds or waterbirds include groups such as diving and dabbling ducks, loons, geese, swans, shorebirds, and gulls. The term waterfowl specifically refers only to species of dabbling and diving ducks, geese, and swans in the family *Anatidae;* and shorebirds refer to sandpipers and plovers. Waterbird is used as an umbrella term to encompass those species that use wetlands for foraging, breeding, or staging during the year.

Aerial waterbird surveys were conducted using modified aerial transect survey methodology (RISC, 1999b). Wetlands and other waterbodies were identified prior to surveys, and transects flown in the study area. The surveys were completed with two observers using a Jet Ranger 206 helicopter flying from 100 m to 250 m in elevation and at speeds from 5 km/hr to 30 km/hr. Surveys took place in July of 2011 and 2012 to increase the likelihood of detecting potential breeding waterbirds. All waterbirds encountered during these surveys were identified, when possible, by species, age, sex, and number of individuals, which was then recorded. Additional wildlife species observed during these surveys were recorded as incidental observations.

As outlined in Hanson *et al*. (2009), open pit mining, roads, transmission lines, and airstrips may impact bird groups including waterbirds and shorebirds through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation and invasive species, nest habitat creation, and contamination. The key variables considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited exceed the CWS guidance in Hanson *et al*. (2009) as they employ habitat classification and selection of representative patches of habitat, variable centred point counts and habitat loss defined by **Equation 1**. Nest searches are recommended as the primary approach to pre-clearing and pre-construction surveys if clearing is occurring during breeding seasons. RISC standard variable radius point breeding bird surveys and aerial/ground based surveys exceed the CWS guidance in Hanson et al., 2009 as they identify species, densities, potential breeding, residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species that may occur in the Project area, or be affected by the Project within the LSA.

BC RISC standards for surveys were integrated with conceptual principles and scientific methodologies consistent with Hanson *et al*. (2009) and the CEAA Guidance for EIS (CEAA, 2013) and will be integrated in any future mitigation and monitoring surveys.

2.7 Other Wildlife Species

While there are no other federal guideline documents that specifically address survey methodology for other wildlife species groups, the guiding principles of Hanson *et al*. (2009) were applied to these other species groups. As outlined in the principles of survey methodology and assessment of Hanson *et al*. (2009), open pit mining, roads, transmission lines, and airstrips may similarly impact other wildlife through habitat loss (including edge effects and interior habitat loss), fragmentation, transformation, invasive species, and contamination. The key variables considered are number of individuals per unit area of habitat affected and potential breeding success. Surveys following RISC standards cited meet or exceed the survey and assessment principles discussed by Hanson *et al.* (2009) as they employ species-specific survey and habitat modelling methodology, habitat classification and selection of representative patches of habitat, and habitat loss defined by **Equation 1**. Further details on survey methodologies for other wildlife species may be provided if required by the commenter.

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