Appendix 7.2.6A
Blackwater Gold Project
Navigable Waters Baseline Report and Technical Assessment 2014

New Gold Inc.

BLACKWATER GOLD PROJECT
Navigable Waters Baseline Report and Technical Assessment 2014

newgold

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BLACKWATER GOLD PROJECT
NAVIGABLE WATERS BASELINE REPORT AND TECHNICAL ASSESSMENT 2014

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Preface

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Preface

On April 1, 2014 the *Navigable Waters Protection Act* (NWPA; 1985) was repealed and replaced by the *Navigation Protection Act* (NPA; Transport Canada 2013a). Among other changes, the NPA focused Transport Canada's licensing authority to a schedule of navigable waters and also provided an opt in clause for proponents whose projects may affect navigable waters not listed on the schedule. This *Navigable Waters Baseline Report and Technical Assessment* for the Blackwater Project (the Project) has been updated to ensure conformity with the NPA and provides information relevant to s.5(4)(a) and (c) of the NPA on the characteristics and current/anticipated navigation in waters affected by the Project as well as how the NPA s.22 prohibition against dumping applies to tailing storage facility (TSF) works/activities of the Project.

The key updates that have been made to this report to meet NPA requirements are:

- The Regulatory Context (Section 1.2) has been updated to be concordant with the NPA.
- Project works have been reviewed against the revised *Minor Works Order* (Department of Transport 2014) instead of the *Minor Works and Waters Order* (MWWO; 2009).
- The previous assessment conducted under the MWWO of whether waters affected by the Project are minor or not is still considered to contain data relevant to physical characteristics of navigability; this assessment has been moved to Appendix D. Results of the previous MWWO screening exercise are being used to support an assessment of navigability under case law in the following way:
  - Waters found to be "minor" under the MWWO are considered ***not*** physically capable of supporting navigation, therefore not requiring any further assessment of navigability or assessment of potential effects on navigation in the main body of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS).
  - Waters found to be "non-minor" under the previous MWWO assessment are further assessed using jurisprudence criteria linked to the public right to navigation in Canada.

None of the waters affected by the Project are listed in the NPA schedule of navigable waters (1985) so approvals under s.5 of the NPA are not required. However, the proponent will opt in under s.4(1) of the NPA for key physical works to seek an official assessment of navigability for the affected waterbody (previously determined to be non-minor under the NWPA). The list of works-waters interactions for which New Gold will submit Notice of Work Applications to Transport Canada is provided in Section 4 of this report. S.22 of the NPA prohibiting deposition of material applies to all navigable waters in Canada, not just those on the Schedule to the Act. Therefore, Notice of Works will need to be submitted where Project works/activities related to the engineered TSF interact with water to support TCs review of the navigability of the affected waterways.

Executive Summary

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Executive Summary

New Gold Inc. (New Gold) is proposing to develop the Blackwater Gold Project (the Project) in order to extract gold and silver from the Blackwater ore deposit (AMEC 2012). The Project lies in central British Columbia (BC), approximately 112 km southwest of Vanderhoof and 446 km northeast of Vancouver. Key Project works that have the potential to interact with a navigable water include a Mine Access Road (MAR), an air strip, a transmission line, an open pit, a milling facility, a tailings storage facility (TSF), waste rock piles, a freshwater supply system, and fish habitat compensation sites.

This report presents baseline data and analysis to support an assessment of the potential effects of the Project on the public use (i.e., commercial, recreational and Aboriginal) of surface water resources for navigational travel or transport. The Project is subject to a coordinated provincial-federal EA review process under the BC *Environmental Assessment Act* (BC EAA; 2002) and the *Canadian Environmental Assessment Act* (CEAA; 2012). There is a public right to navigation in Canada along navigable waters, which can only be restricted by an act of parliament, such as the *Navigation Protection Act* (NPA;1985). The NPA allows for the application and approval of "works" that may interfere with navigation along "navigable waters" that are either on a Schedule to the Act, or where a proponent opts in to have a work included into the approval process under s.4 of the Act. The Preface and Section 1.2 of this report outline the regulatory context of recent changes to the NPA and how the Act and common law criteria regarding navigability are applicable to the Project.

A description of the navigable waters setting of the Project is provided in Section 1.3, including both the general physical and social setting. The social setting includes an analysis of the commercial, recreational and traditional access and use of the lands and waters in the Project region, which relates to the jurisprudence criteria of public utility and access of waterways for navigation, as well as their value to public users (i.e., subsistence, commercial or recreational) for navigational purposes.

The objectives of this report are to: 1) identify Project works and affected waters, 2) conduct a technical assessment of which works qualify as "minor" classes under the NPA, 3) conduct a navigability assessment for waters affected by the Project using physical characteristics and public utility criteria established under the jurisprudence interpretation of navigability (as concordant with s.5(4)(a) and (c) of the NPA), 4) assess applicability of s.22 and s.23 of the NPA prohibited activities to the Project, and 5) identify which waters New Gold will submit Notice of Works forms for. This report supplements an assessment of the potential effects of the Project on navigation conducted for New Gold by AMEC Environment and Infrastructure (AMEC), presented in the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS).

Project components found to interact with waterways are interpreted to serve as works (Section 2.3). Field studies to collect data (see Appendix A) to support the navigable waters study were conducted for reaches affected by Project works, including those in the Mine Site footprint (Section 3.2), off-site linear features (e.g., transmission line crossings; Section 3.2), freshwater system supply pipeline crossings, MAR crossings, and an upgrade along the Kluskus-Ootsa forest service road to the Project. Engineering drawings of Project works are provided in Appendix B. Photos of waters affected by the Project are provided in Appendix C.

A prior screening assessment against the old *Minor Works and Waters Order* (MWWO; (2009) and predicted flow effects from activities in the mine site for the Project is included in Appendix D, which has been updated with an evaluation of minor works under the amended Minor Works Order recently

issued under the NPA (Department of Transport 2014). Waters previously identified as minor under the previous MWWO (Appendix D) are considered to not have the physical characteristics necessary for navigation, and so waters identified as minor in Appendix D have been screened out of the navigability assessment. Waters previously identified as non-minor (Appendix D), as well as minor waters affected by the TSF, have been screened into the navigability assessment presented in this report.

The assessment results regarding the navigability of non-minor waters using common law criteria identifies five waterways affected by Project works to be navigable: the Nechako River at aerial crossing TL-1065, the Stellako River at aerial crossings TL-937 or SR-003, Turtle Creek at the mine site access road crossing AP-007, and Tatelkuz Lake where the FSS-000 water intake for the freshwater supply system will be. Chedakuz Creek, which is downstream of Project works, is also deemed navigable. New Gold may opt in to the NPA approvals process under s.4 of the Act depending on the advice received by Transport Canada upon review of this report.

With respect to s.22 and s.23 of the NPA (1985) regarding prohibitions against depositing material into a navigable water that is liable to sink, and dewatering a navigable water, the results of this assessment indicate that these sections of the NPA do not apply to the Project. S.23 does not apply since the drawing of water from Tatelkuz Lake will be negligible, and dewatering is defined as drying out of a waterbody. S.22 is deemed not to apply since the affected waters have been deemed to not be navigable and since there is no way for tailing to flow downstream of the engineered TSF. Therefore, an application under s.24 of the NPA for a Governor in Council (GIC) order to exempt the waterways under the Project TSF footprint from s.21-23 in whole or in part is deemed not required for the Project. If Transport Canada determines that any of these sections of the NPA do apply to the Project, New Gold will submit an application under s.24, and has conservatively included extra information in this report relevant to the s.24 application to assist Transport Canada in their assessment.

Acknowledgements

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Acronyms and Abbreviations

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Acronyms and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

AIR	Application Information Requirements
Application/EIS	Application for an Environmental Assessment Certificate / Environmental Impact Statement
CEAA	*Canadian Environmental Assessment Act*
EA	environmental assessment
FNR	functionally non-roaded
FSR	Forest Service Road
GIS	geographic information systems
HWM	high water mark
LSA	Local Study Area
LOM	life of mine
MAR	mine access road
MWWO	Minor Works and Waters Order
NPA	*Navigation Protection Act*
NWPA	*Navigable Water Protection Act*
NWPP	Navigable Waters Protection Program
NPP	Navigation Protection Program
NTS	National Topographic System
NVC	No visible channel
ROC	records of contact
ROW	right-of-way
RN/RM	road natural/road modified
SPM	semi-primitive motorized
SPNM	semi-primitive non-motorized (SPNM)
TC	Transport Canada
TSF	tailing storage facility
UTM	Universal Transverse Mercator
UWR	ungulate winter range
WSC	Watershed Code

%	percent
>	greater than
<	less than
cm	centimetre
d	day
ha	hectare
hr	hour
km	kilometre
km^2	square kilometre
m	metre
M	million
masl	metres above sea level
t	tonnes

1. Introduction

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1. Introduction

1.1 BACKGROUND AND OBJECTIVE

New Gold Inc. (New Gold) is proposing to develop the proposed Blackwater Gold Project (the Project) in north central British Columbia (BC), approximately 160 kilometers (km) southwest of Prince George, 446 km northeast of Vancouver, and 110 km (straight-line) southwest of Vanderhoof (Figure 1.1-1). The mine site is centred at 53° 11' 22.872"N 124° 52' 0.437"W (5893000 N and 375400 E), and is located in National Topographic System (NTS) sheet 93F/02. The Project will span a two-year pre-production (construction) phase followed by a 17 year operation phase with a nominal ore production capacity of 60,000 tonnes per day (tpd). The current resource estimate indicates combined Indicated and Inferred resources of 7.1 Moz Au and 30 Moz Ag at a 0.32 g/t Au equivalent (AuEq) cut-off grade. The Feasibility Study mine plan involves mining 344 Mt of ore, 690 Mt of waste rock and 50.4 Mt of overburden for a total production of 1,084 Mt of material. (AMEC 2014)

The Project will involve on-site development at the 4,400 hectare (ha) mine site of the Blackwater deposit in the Cariboo Regional District as well as off-site components. On-site components will include the open pit mine, an ore processing plant, a tailings storage facility (TSF), waste rock piles, stockpiles, borrow areas, a construction camp, an operation camp, and a truck shop. Off-site components will include a transmission line, a mine access road (MAR), a freshwater supply system, an air strip, an upgrade along the Kluskus-Ootsa Forest Service Road (FSR), and fish habitat compensation sites. The Kluskus-Ootsa FSR and transmission line also cross into the Bulkley-Nechako Regional District.

The assessment presented in this report supports the environmental assessment (EA) of the effects of the Project on the public use (i.e., commercial, recreational and Aboriginal) of surface waterways for navigation. The Project is subject to a coordinated provincial-federal EA review process under section 16 of the BC *Environmental Assessment Act* (BC EAA; 2002) and the *Canadian Environmental Assessment Act* (CEAA; 2012). The assessment of effects on navigation is required pursuant to sections 5(2)(a) and (b) of CEAA. Accordingly, navigation was listed as a component requiring assessment in the federal Environmental Impact Statement (EIS) Guidelines for the Project (2012). The Application Information Requirements (AIR) for the Project also requires that the effects on navigation be considered for the Project (New Gold Inc. 2013).

This technical navigation assessment and the advice from Transport Canada (TC) pending their review of it, will help to inform the proponent: 1) whether or not to opt in under s.4(1) of the *Navigation Protection Act* (NPA; see Section 1.2.1; 1985) to seek approval for any Project works, and 2) on the applicability of s.22 and s.23 of the NPA regarding prohibited activities involving depositing materials in navigable waters and/or dewatering respectively. In addition, this navigable waters baseline report will support the assessment of potential Project effects on navigational safety and access, conducted for New Gold by AMEC Environment and Infrastructure (AMEC) in the Application/EIS.

1.2 REGULATORY CONTEXT

There is a public right to transit navigable waters in Canada that is broadly protected under common law. The only way that this right can be restricted is through regulatory approval provisions by an Act of Parliament, such as the *Navigation Protection Act* (1985). How the NPA applies to the waters affected by the Project is described in Section 1.2.1.

Figure 1.1-1

General Location of Blackwater Gold Project

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The right to navigation and the NPA only apply to "navigable" waters, and so navigability for waters that proposed works affect must be assessed as a first step towards ascertaining and mitigating any effects of proposed works to navigational access and safety. Jurisprudence provides an interpretation of navigability (Section 1.2.2), based on physical and public utility criteria derived from case law precedent; this interpretation informs the assessment methodology of navigability used in this report (Section 2.5). The NPA doesn't provide a specific definition of a navigable water except to say that it can include "a canal and any other body of water created or altered as a result of the construction of any work."

Consultation relating to navigation, including pertaining to the current use of lands and resources for traditional navigational purposes has been conducted by New Gold and is on-going. The Section 11 Order (July 9, 2013) issued by BC EAO requires New Gold to consult with the following five Aboriginal groups: the Lhoosk'uz Dene Nation, the Nadleh Whut'en First Nation, the Saik'uz First Nation, the Stellat'en First Nation, and the Ulkatcho First Nation. BC EAO has also identified the Nazko First Nation, Skin Tyee First Nation and Tsilhquot'in National Government as Aboriginal groups to be notified with relevant information at key milestones (BC EAO 2013). New Gold also continues to engage in discussions with the Carrier (Dakelh) Chilcotin Tribal Council and the Carrier Sekani Tribal Council. The EIS Guidelines issued by the Canadian Environmental Assessment Agency (CEA Agency; 2013) require the proponent to engage with the same Aboriginal groups (Lhoosk'uz Dene Nation; Nadleh Whut'en First Nation; Saik'uz First Nation; Stellat'en First Nation; Ulkatcho First Nation; Nazko First Nation; Skin Tyee First Nation; Tsilhquot'in National Government) as well as the Métis Nation of BC.

1.2.1 *Navigation Protection Act*

1.2.1.1 Approvals of Works

The NPA approvals process only directly applies to works affecting navigable waters listed in the Schedule to the NPA. None of the waters affected by the Project are listed on this Schedule. Therefore, Project works are not legally subject to the NPA unless New Gold elects to opt in under s.4(1) for works affecting potentially navigable waters.

S.2 of the NPA defines a "work" as "any structure, device or thing, whether temporary or permanent, that is made by humans. It also includes the dumping of fill or any excavation of materials from the bed of any navigable water". By this definition, works for the Project (Sections 1.4 and 2.3) may include culverts, bridges, transmission lines, and pipelines that cross waterways; water intakes for the freshwater supply system; and a series of works such as dams and diversion structures in the upper reaches of Davidson Creek to create the TSF and divert water around open pit and waste dumps to establish fish habitat compensation sites, and manage water flow levels.

The previous *Minor Works and Waters Order* (MWWO; 2009) under the NWPA has been amended and published under the Canada Gazette (Department of Transport 2014), leading to a revised *Minor Works Order* under the NPA (Transport Canada 2014b), which is largely congruent with the previous MWWO. Project works found to be minor are identified in the "works" screening conducted for the Project presented in Appendix D; these works are excluded from further assessment.

The baseline studies conducted for the Project under the former NWPA also considered the minor waters criteria previously in force under the MWWO. While minor waters criteria are no longer applicable under the NPA, the data (e.g., width, depth measurements) and the results of the previous assessment to identify minor and non-minor waters are still considered relevant to the determination of physical characteristics of navigability under common law. For the purposes of this report, waters previously deemed minor under the MWWO are considered ***not*** physically capable of supporting

navigation, and therefore not navigable, and so are excluded from the navigability assessment based on jurisprudence criteria in this report. The MWWO minor waters assessment conducted for the Project is provided in Appendix D; waters found to be non-minor in Appendix D are screened into the navigability assessment in this report.

1.2.1.2 NPA Prohibited Activities

TC advised New Gold that the construction and operation of a TSF in the upper reaches of Davidson Creek may be subject to s.22 of the previous NWPA, which is analogous to the prohibition against deposition of material in s.22 in the NPA. As advised by TC, the prohibition is applicable to all navigable waters, not just the ones on the Schedule to the NPA, so this report assesses the waterways affected by the TSF in Section 3.1 to ascertain their navigability based on jurisprudence criteria derived from case law precedent. The proponent's interpretation of the applicability of the NPA regarding s.22 based on the navigability assessment in this report is contained in Section 3.2.2.

The NPA also contains a prohibition against "dewatering" in s.23. Dewatering is defined by TC as "drying up the navigable water" (Transport Canada 2014a). The Project will require water withdrawal for make-up water process needs from Tatelkuz Lake, but since this activity will only lead to negligible changes in lake water levels (Appendix D; Section 3.1.1.3, Table 3.1-12), it is deemed that s.23 of the NPA would not apply to this activity. There will be other flow effects of the Project on Creek 661, Creek 705, Davidson Creek, and Chedakuz Creeks as a result of works in the mine site, as described in Appendix D, Section 3.1.1.3. As none of the Project activities will lead to the drying of any navigable water, s.23 of the NPA is interpreted to not apply to the Project and is therefore not considered further in this report.

1.2.2 Legal Interpretation of Navigability

Most Canadian jurisprudence on what constitutes a navigable water, to which the public has a right of passage along, is built up from case law around the rights of riparian owners. Where the public right of navigation has already been established on a given waterway (through desk or field based studies, observation and/or consultation records), the waterway is typically considered navigable in the courts. Where navigation on a waterway is not already established, there is a lack of certainty as to what actually constitutes a navigable water under case law precedent in Canada (Four Point Learning 2013). As highlighted in the *Simpson v. Ontario* case, "The jurisprudence is mixed and each case seems to lack a consideration that would make it a determinative statement of law" (2011).

Nevertheless, there are a few general principles on the public right to navigate that have emerged from case law that could also analogously be applied to waterways affected by Project works. For instance, the Coleman principles (1983), that describe physical and public utility criteria, are the most widely cited criteria for determining navigability. Along with the Coleman principles, there are cases applicable to the interpretation of navigability under the previous NWPA (1985), such as *IMC v. Canada* (1993), which have delineated a framework for assessing navigability that is described in Section 2.5.2 and applied to assess the navigability of waters affected by Project works in Section 3.1.

1.3 NAVIGABLE WATERS SETTING

The following sections describe factors that are relevant to the determination of which waterways affected by the Project are considered "navigable". These factors include the physical characteristics of waterways that affect their navigability, as well as factors pertaining to the accessibility and public utility of waterways (including current and past commercial, recreational, and Aboriginal access and use) within and around the Project footprint.

1.3.1 Physical Setting

1.3.1.1 General Environmental Setting

The mine site is located in the Nechako Plateau, within the Interior Plateau east of the Coast Mountain Range, along the northern flanks of Mt. Davidson (Figure 1.3-1). The Nechako Plateau topographic landscape consists of moderate relief mountains with wide, gently sloping glacial valleys. Topographic features are largely associated with glacial deposition and erosion and include flutings, parallel ridges, eskers, melt water channels, and localized moraines. The elevation of the Blackwater property ranges from just over 1,000 m in low-lying areas northeast of the mine site to 1,800 m at the summit of Mt. Davidson, the highest peak in the Fawnie Range. The Project area spans two ecoregions, the Fraser Plateau and Fraser Basin; and three ecosections, the Nazko Upland, Bulkley Basin and Nechako Lowland (AMEC 2013).

The climate in the Project area is sub-continental, characterized by brief warm summers and long cold winters resulting from the influence of cold arctic air. The climate is also influenced by moisture-laden weather systems moving east by way of the low Kitimat Ranges. Temperatures range from a minimum of -40°C in winter to a maximum of 32°C in summer. Average annual precipitation is 636 mm/a, with 310 mm falling as rain and the rest as snow. The rainy season is from May to September. Snow typically starts to accumulate in October, and snowmelt is generally between April and May. The prevailing wind direction is from the southwest (AMEC 2014). Long-term climate and streamflow records indicate no notable climate change effects on climatic or hydrologic conditions near the Project, with the exception of possibly decreasing peak annual peak flows (Knight Piésold Ltd. 2013b).

1.3.1.2 Hydrological Setting

Factors such as catchment size, precipitation, runoff and groundwater affect the flows of surface waterbodies in the regional area; streams in the region of the Project are typically characterized by high flows in the late spring and early summer (May and June) due to rain and snowmelt, and low flows during winter (Knight Piésold Ltd. 2013b). Many lakes and streams in the area freeze over in winter months and are not available for navigational purposes during this time.

There are almost 1,000 fish bearing lakes on the Nechako Plateau (Minister of Forests 1997). A detailed description of each watershed, stream, and tributary potentially affected by the Project is presented in the Fish and Aquatic Resources 2011-2012 Baseline Report (AMEC 2013b). The Project is situated almost entirely within the Lower Nechako Reservoir catchment, with the transmission line also crossing through the Cheslatta River, Nechako River, Francois Lake, and a small portion of the upper Euchiniko major watersheds (Figure 1.3-1). Local watershed catchment areas intersected by the mine site are provided in Figure 1.3-2. Major streams and lakes in the Project mine site vicinity that intersect with Project components or activities are (Figure 1.3-2; AMEC 2013c):

- **Tatelkuz Lake**, the second largest lake in the headwaters of Chedakuz Creek, with a 927 ha surface area, a volume of 188 Mm^3, and mean depth of 20 m;
- **Chedakuz Creek,** which originates from the northern flank of Kuyakuz Lake northwards into Tatelkuz Lake, and then continuing to flow northwest out of north Tatelkuz Lake to eventually drain into the Nechako Reservoir;
- **Davidson Creek**, with a drainage area of 77 km^2, this creek runs through and drains the Blackwater property and flows northwest into Chedakuz Creek downstream of Tatelkuz Lake;
- **Lake 01682LNRS**, a small headwater lake in the uppermost reach of the Davidson Creek watershed that has one circular basin with the deepest point at the centre, a large littoral

area, two small islands, no inlets, one outlet to Davidson Creek, and an estimated surface area of 9 ha;

- **Creek 661**, a stream that drains the Blackwater deposit area of the Project mine site flowing northeast to become a tributary of Chedakuz Creek prior to flowing into Tatelkuz Lake;
- **Turtle Creek**, a stream that originates east of Top Lake and flows into Chedakuz Creek approximately 2 km downstream of where Davidson Creek merges into it;
- **Creek 705**, a stream west of the Blackwater property that flows down the west side of Mount Davidson into Fawnie Creek that flows into the Entiako River, which then flows into the Nechako Reservoir; and
- **Lake 01538UEUT**, a upper reaches lake draining into the Creek 705 watershed with a 9 m deep western basin and a larger and deeper eastern basin.

Most of the mine site area (including the TSF, waste rock dumps, and process plant) lies within the Davidson Creek watershed, with the open pit (centred on the star in Figure 1.3-2) and East waste rock dump crossing into the catchment of Creek 661. The Davidson Creek valley is incised locally and flows northeast from the mine site to Chedakuz Creek downstream of Tatelkuz Lake. Creek 661 water flows to Tatelkuz Lake, which flows into Chedakuz Creek. Chedakuz Creek drains northwest via the Nechako River system into the Nechako Reservoir (created by the construction of the Kenney Dam in 1952).

Turtle Creek, which will be crossed by the MAR and transmission line, parallels Davidson Creek to the north, and several other smaller streams run parallel to the south, all of which contribute to the Chedakuz Creek drainage basin (New Gold 2012).

Of all the waterbodies discussed above, Davidson Creek will be the most affected by the Project. Activities at the mine site will affect the water balance, affecting flow levels, particularly in Davidson Creek. The mean annual values used to calculate mine site water balance are 636 mm for precipitation (with 310 mm as rainfall and 326 mm as snowfall), 100 mm for sublimation, and 226 mm for snowmelt, 536 mm of available precipitation, 443 mm of lake evaporation, and available runoff of 199 mm (Knight Piésold Ltd. 2013c). Further information (such as monthly and stochastic values and runoff coefficients) on the Project's hydrological water balance model is provided in the Blackwater Project – Feasibility Study Water Balance Model (Knight Piésold Ltd. 2013c), and further information on water management in the mine site is provided in Section 2 of the Application/EIS.

Tatelkuz Lake has been proposed as the source of fresh water supply intake to the Project mine site. The lake is located northeast of the Project (Figures 1.3-1 and 1.3-2) and is approximately 919 ha in surface area. Tatelkuz Lake has known commercial and recreational navigation activities associated with kayaking, canoeing, boating, fishing, and float plane activity. The Tatelkuz Resort, located on the northwest shore of Tatelkuz Lake, is a wilderness resort and cattle/dude ranch offering fishing, boating, kayaking, and canoeing on the lake, as well as wilderness excursions. Snake Lake, which may be used as an alternative source of freshwater for the Project, is smaller (approximately 52 ha).

Water management and fish habitat compensation activities to support the Project are planned that will affect flows in the Davidson Creek catchment (from changes proposed to Davidson Creek reaches 12 and 13, and Lake 01682LNRS), as well as flows in the Creek 705 catchment (from changes proposed that will affect Lake 01538EUT and the upper reaches of Creek 705). These two lakes, reaches, and the Davidson Creek and Creek 705 catchments are illustrated in Figure 1.3-2.

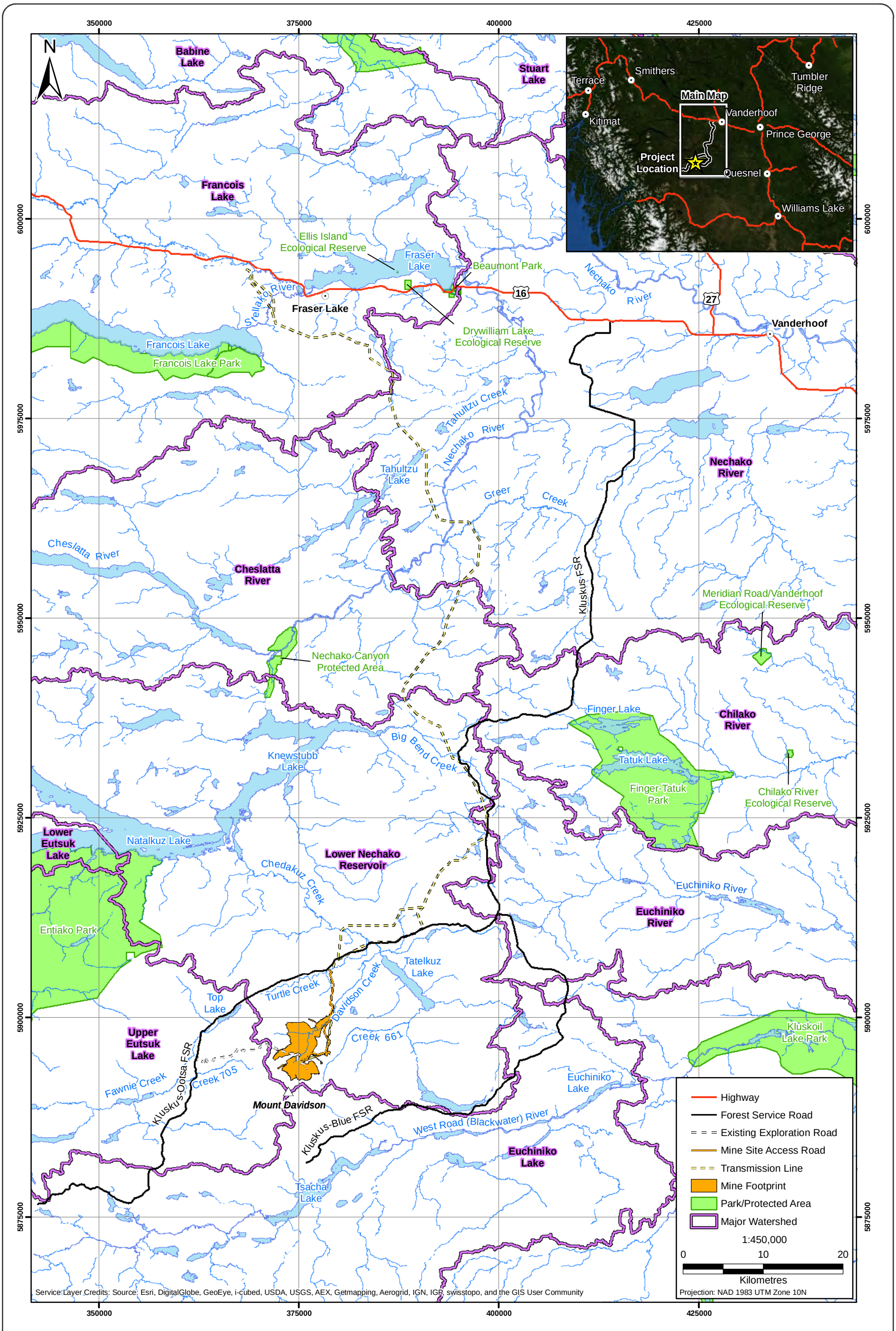

Figure 1.3-1

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Blackwater Gold Project Regional Setting

Figure 1.3-1

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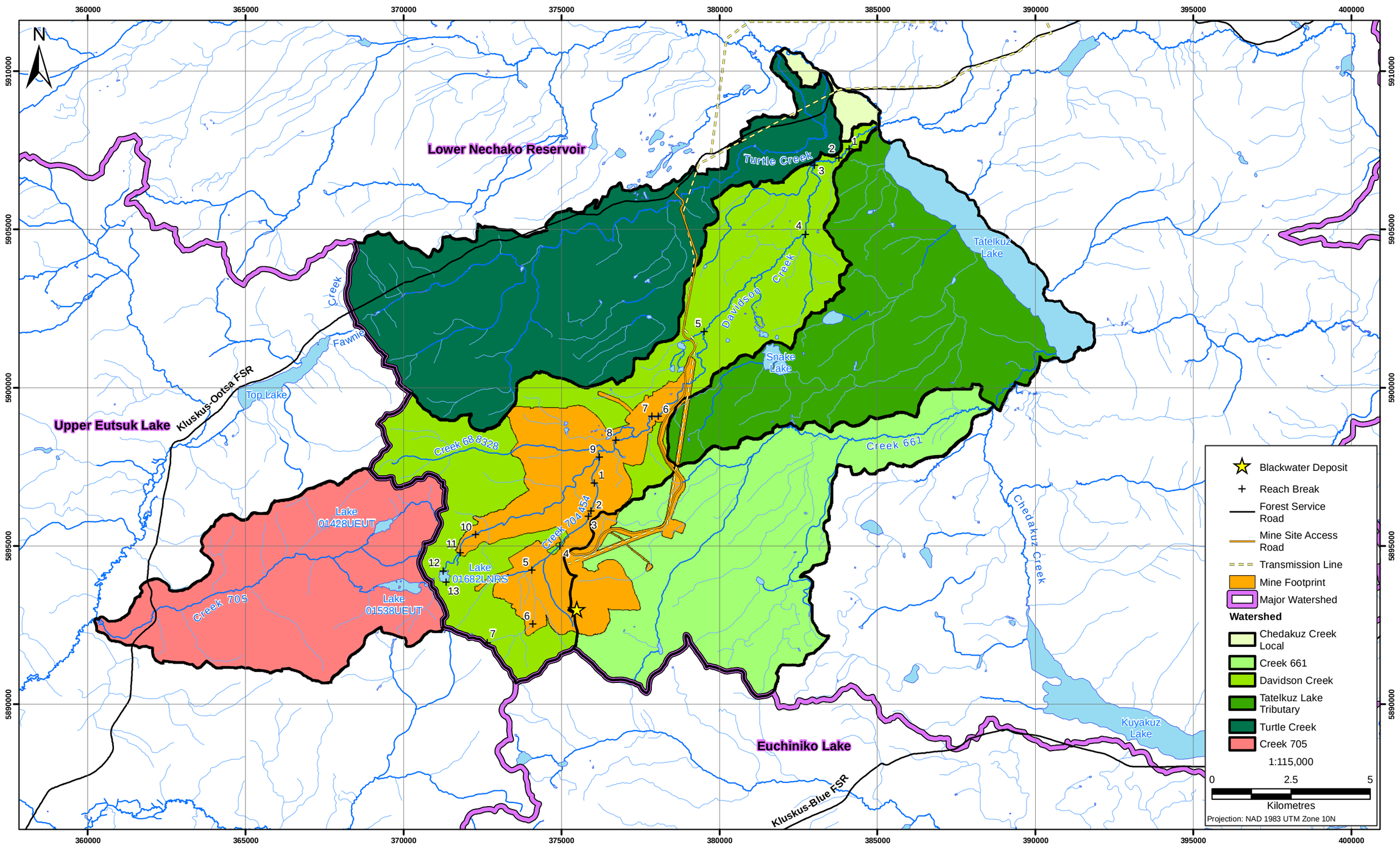

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Figure 1.3-2

Blackwater Gold Project:
Watershed and Sub-Catchment Boundaries

1.3.2 Navigational Public Use Setting

The Project area is very sparsely inhabited, with two ranches found within a 20 km radius of the Project site. Vanderhoof is a district municipality with a population of approximately 4,500 residents. Some services are available in Vanderhoof, but Prince George is the regional hub with air service from major centres. There is no grid-connected power system in the direct vicinity of the Project. The main BC Hydro 500 kV transmission lines supplying western B.C. are approximately 100 km to the north. As illustrated in Figure 1.3-1, the proposed transmission line and the existing Kluskus-Ootsa FSR extend from the Project site to the Highway 16 (Yellowhead Highway) corridor. Several interconnection points from the 500 kV lines to existing 230 kV substations and transmission lines are possible in an area between Fraser Lake and Vanderhoof (AMEC 2014).

1.3.2.1 Non-traditional Land Use and Navigation Setting

The Project mine site footprint is located within the Vanderhoof Land and Resource Management Plan (LRMP), approved by the BC government in 1997 (Minister of Forests 1997). The LRMP covers 1.38 million hectares (ha) of Crown land and includes provisions relating to commercial and recreational access and uses. The Vanderhoof LRMP establishes several Resource Management Zones (RMZs). The Project mine site footprint is located mostly in the Davidson Creek RMZ 17, which is designated as "Resource Development Emphasis", and borders on Multi-value Emphasis Zones (AMEC 2013e). Access restrictions are a key part of the management of this RMZ. The intent of the Davidson RMZ 17 is to: balance resource development with wildlife, First Nations, and recreational values through appropriate access management; limit access to the whole area south of the Kluskus-Ootsa FSR (which is associated with resource development); and manage the northwest zone to restrict access and provide a buffer for critical caribou winter range that lies further west (Minister of Forests 1997).

Access Considerations

The Vanderhoof LRMP had an Access Management Plan that was historically implemented (1998 to 2005) to prevent vehicular access into identified Access Management Areas, restricting access to parts of the LRMP to semi-primitive non-motorized (SPNM) recreational use (e.g., allowing access for the purposes of hiking and horseback riding). Closures were in place year round for the preservation of recreation, fish and wildlife values ((ILMB) 2008). More recently, efforts to control the mountain pine beetle (MPB) epidemic in BC, and to recuperate economic losses (such as through MPB timber harvesting), has led to motorized resource road expansion that, in 2005, necessitated an amendment to the Access Management Plan in the LRMP.

The Project mine site is located within a remote area in the upper reaches of Davidson Creek that is largely made up of wilderness land that is mostly inaccessible by road, except by the recently constructed exploration road for the Project, for which public access is restricted. Public access to the Project footprint will also be restricted per BC *Mines Act* (1996) requirements (Section 3.1.1).

The amended Access Management Plan under the Vanderhoof LRMP sets out the following access management designations, which restrict public recreational and some commercial use to be semi-primitive (i.e., horseback riding, hiking, guiding and some hunting and trapping) ((ILMB) 2008):

- motorized road access: road natural/road modified (RN/RM);
- motorized road access semi-remote: semi-primitive motorized (SPM);
- non-road accessible recreation: semi-primitive non-motorized (SPNM); and
- non-road accessible recreation: semi-primitive non-motorized, functionally non-roaded (FNR).

The accessibility of waterways in an area is a consideration in the determination of navigability under common law (Section 2.5), particularly for waters where navigation is not historically established. As illustrated in Figure 1.3-3, access to much of the lower reaches of Davidson Creek (not including around Tatelkuz Lake), most of Site D of the tailing storage facility (TSF), and the headwater areas southwest of the Site C saddle dam and open pit and dump area, is restricted to SPNM; while some roads in the area are for industrial forestry use (resource service roads), the Access Management Plan requires these roads to be blocked to public use. Some of the Project area (i.e., Site C of the TSF, the open pit, waste dumps and processing area) is RN/RM; however, aside from the exploration road (blocked to public access during the life of the Project), there is no road access into this area of the Project (see Figure 1.3-3). The 133 km long transmission line crosses areas designated as SPM, SPNM, and RN/RM (Figure 1.3-3). No FNR areas are intersected by Project components.

Parks and Protected Areas

There are no designated National Historic Sites, Marine Conservation Areas, Wildlife Areas, or Migratory Bird Sanctuaries in the vicinity of the Project, nor any overlap with Provincial Parks or protected areas in the local study area. Nine Provincial Parks or protected areas fall within the non-traditional land use regional study area (RSA; Figure 1.3-4; AMEC 2013e). The closest park to the proposed Project, Entiako Provincial Park, is located approximately 26 km northwest of the mine site (Figure 1.3-1).

Recreational Land Use

Figure 1.3-4 illustrates the non-traditional use of lands in the regional area of the Project, indicating the location of recreation sites, trails, and commercial lodges. Designated recreational sites are in the area, with the closest being at Top Lake South, situated approximately 8 km northwest of the mine site at Top Lake (Figure 1.3-4). The regional Project area is used for various forms of recreation, including: ecotourism, wildlife viewing, horseback riding, hiking, cultural heritage experiences, and hunting, and camping in forest recreation sites (AMEC 2013e). There are also several historically and culturally significant trails within 20 km of the Project footprint, such as the Messue Wagon Road, and Messue Horse Trail/Kluskus Bypass, and the Alexander Mackenzie Heritage Trail described further in Section 1.3.2.2, as these were used in earlier periods as Grease Trails by Aboriginal groups (AMEC 2013e). The Project mine site and transmission line footprint overlap with recreation scenic areas (coloured yellow in Figure 1.3-4).

A number of lakes, rivers and streams surrounding Vanderhoof are popular for recreational fishing. Several fishing spots are accessible by FSRs or other roads, while some water bodies are accessed by kayak, canoe, boat or float plane (AMEC 2013e). In the regional area, some of the most important fishing water bodies include the Nechako River and Reservoir (Knewstubb Lake), Tatuk Lake, Finger Lake, Top Lake, Stellako River, and Chedakuz Creek[1] (Figure 1.3-5). Some anglers also hike into a number of smaller waterways in the area (Government of BC 1997). Float plane service is offered by several fishing lodges in the region, primarily to anglers seeking more distant fishing spots; anglers also camp in Forest Services' campsites or less established designated camping sites (AMEC 2013e).

The busy season for most surface waters in the region spans from May to the end of October, as long as watercourses remain unfrozen. Major rivers see frequent use at most water levels and on all navigable stretches, while some smaller streams are used by locals during the spring and through the fall. Navigation in the Vanderhoof District involves primarily major lakes and rivers, and includes white-water kayaking, canoeing, recreational and commercial boating, and some travel to more remote waterbodies by float plane.

[1] Other waterways used for fishing are discussed in further detail in Section 3.2 (stakeholder consultation information).

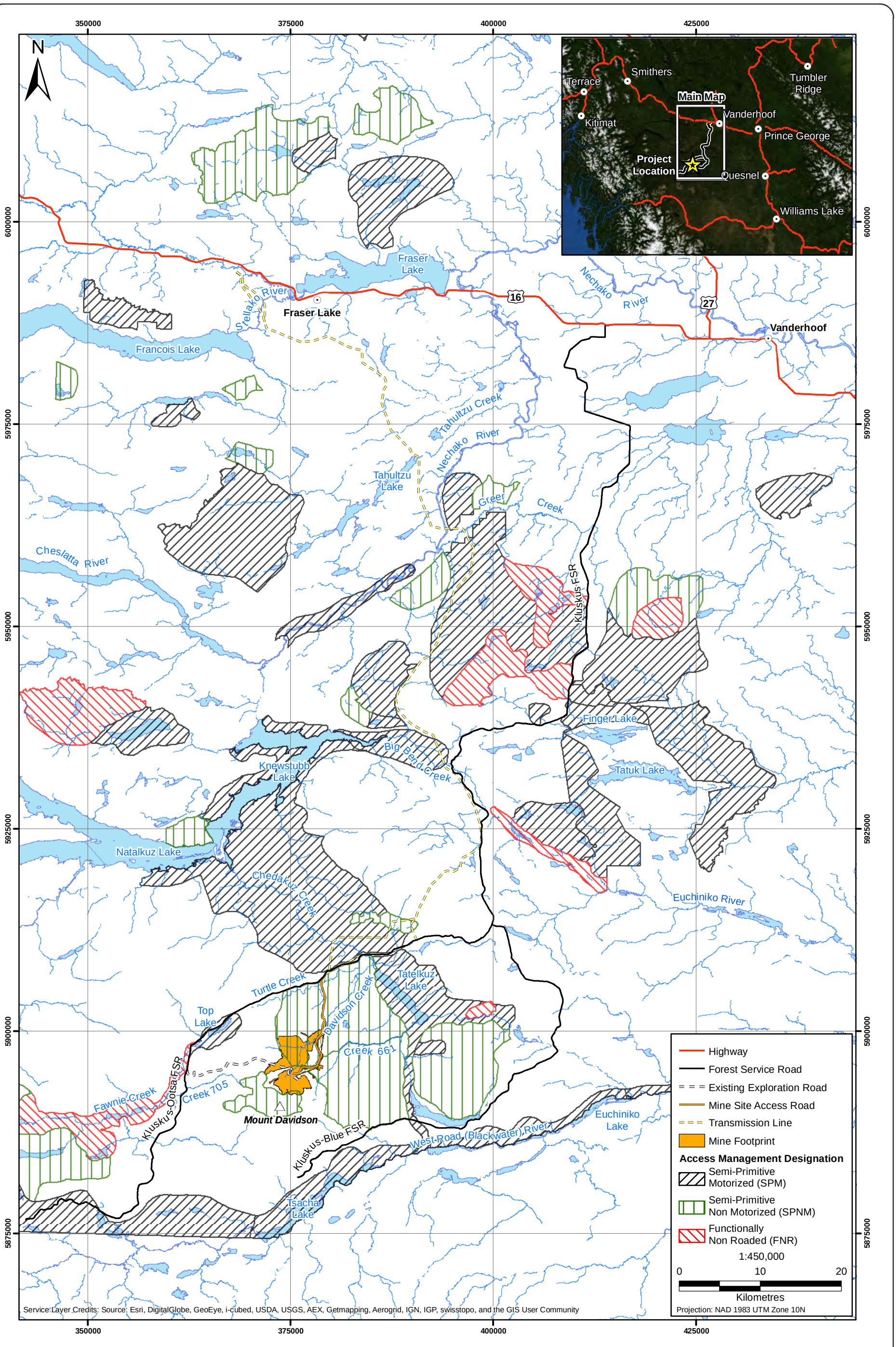

Figure 1.3-3

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Access Management Designations near the Blackwater Project

Figure 1.3-3

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330000 360000 390000 420000 450000

6000000 5970000 5940000 5910000 5880000

N

Legend

- Community
- Highway
- Existing Transmission Line

Forestry Service Roads

- Kluskus FSR
- Kluskus-Ootsa FSR
- Other FSRs

Project Components

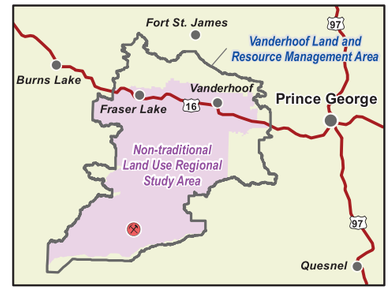
- Exploration Road
- Proposed Mine Access Road
- Proposed Water Pipeline Route
- Proposed Transmission Line
- Proposed Mine Site

Recreation Locations

- Recreation Lodge
- Recreation Trail
- Recreation Area
- Recreation Scenic Area
- Parks and Protected Areas

Non-Traditional Landuse

- Regional Study Area
- Local Study Area



Scale: 1:530,000

0 5 10 20

Kilometres

Reference

BC Government GeoBC Data Distribution
NRCAN Geobase
Ministry of Forests, Lands and Natural Resource Operations

Source: Amec, 2013.

newgold Rescan an ERM company

Figure 1.3-4

Blackwater Gold Project: Non-traditional Land Use Study Areas, Recreation Sites, Trails, and Lodges

PROJECT # 0215644-0002 GRAPHICS # BWG-0002-003_T December 16, 2013

360000 370000 380000 390000 400000

5910000 5900000 5890000

Kluskus-Red
Chedakuz Creek
Proposed Transmission Line
Esker
Kluskus FSR
Kluskus-Euchiniko FSR
Chutanli Lake
Kluskus-Chedakuz FSR
Mills Ranch Reroute
TATELKUS LAKE RESERVE 28
Fawnie Nose 1926m
Kluskus-Ootsa FSR
Tatelkuz Mountain 1611m
Proposed Airstrip
933m
Tatelkuz Lake
TATELKUZ LAKE SOUTH EAST RECREATION AREA
Fawnie Dome 1726m
Fawnie Range
Turtle Creek
Proposed Airstrip Access Road
Davidson Creek
Proposed Water Pipeline
TOP LAKE SOUTH RECREATION AREA
Top Lake
1097m
Proposed Mine Access Road
1387m
1096m
1151m
TATELKUZ LAKE SOUTH RECREATION AREA
Kluskus-Mesache FSR
Creek 661
Kluskus-Malaput FSR
1634m
1231m
Nechako Range
1666m
Fawnie Creek
1444m
Kuyakuz Mountain 1734m
1611m
Lake 01538EUT
Lake 0168LNRS
1668m
Chedakuz Creek
1767m
Mount Davidson 1856m
MESSUE WAGON ROAD
Kuyakuz Lake
Kluskus-Blue FSR
KUYAKUZ LAKE RECREATION AREA
Murray Creek
Tsacha Mountain 1781m
MESSUE HORSE TRAIL
West Road (Blackwater)
Euchiniko Lakes
960m
KLUSKUS 1
UPPER KLUSKUS LAKE 9
Kluskus Village
KUSHYA CREEK 7
KUSHYA CREEK 12
Kluskus Lakes
Kluskus Creek
Tsacha Lake

N

Legend

- Populated Place
- Indian Reserves
- Recreation Area

Forestry Service Roads

- Kluskus FSR
- Kluskus-Ootsa FSR
- Kluskus-Blue FSR
- Other FSRs
- Tracks

Project Components

- Exploration Road
- Proposed Mine Access Road
- Proposed Water Pipeline Route
- Proposed Airstrip Access Road
- *Proposed Transmission Line (Mills Ranch Re-route)*
- Proposed Transmission Line
- Proposed Mine Site
- Proposed Airstrip Extent

Recreation Features Inventory

Sensitivity and Significance Rating

- High sensitivity, very high significance
- High sensitivity, high significance
- Moderate sensitivity, high significance
- Moderate sensitivity, moderate significance
- Low sensitivity, high significance
- Low sensitivity, moderate significance
- Low sensitivity, low significance

Non-Traditional Landuse

- Regional Study Area
- Local Study Area

Scale:1:150,000

0 2.5 5 10

Kilometres

Reference

BC Government GeoBC Data Distribution
BCGOV FLNRO Recreation Sites and Trails Branch

Source: Amec, 2013.

newgold Rescan an ERM company

Figure 1.3-5

Blackwater Project: Sensitivity and Significance Rating for Recreation Areas Overlapping the Mine Site, Mine Access Road and Water Supply Pipeline

For instance, the transmission line crosses the Nechako River (Figure 1.3-1), a popular canoe route from Cheslatta Falls to Prince George (AMEC 2013e). The transmission line also crosses the Stellako River, between Fraser Lake and Francois Lake (Figure 1.3-1), which is also used for canoeing and kayaking. Float planes are restricted to large lakes and rivers due to the space needed for landing and takeoff, such as Tatelkuz Lake and the Nechako and Stellako Rivers.

Figures 1.3-5 and 1.3-6 illustrate the sensitivity and significance ratings for the recreation features inventory areas overlapping the Project Mine Site (including the MAR and water supply pipeline), and the greater Project region (including the proposed transmission line route), respectively. The recreation features inventory rating is intended to serve as a basic tool to "assist Forest Practices Code operational planning and Ministry recreation use management" (BC MOF 1998). This inventory rates recreation feature polygons (RFPs) in terms of their local recreational significance (for providing and supporting recreation opportunities) based on inventories of trails and routes, river recreation, and caves, involving the following factors: activity, attraction, capability to attract recreational use, uniqueness, scarcity, scenic view, amount of current recreational use, accessibility (ease of access can either enhance or detract from its recreational importance), and other factors. Sensitivity is a subjective rating that indicates the relative vulnerability of the RFP area to alterations in value due to resource development; "the higher the sensitivity, the more likely a given alteration may negatively impact the recreation resource and/or cause public concern" (BC MOF 1998).

As shown in Figure 1.3-5, the Mine Site RFP area along Davidson Creek is mostly designated as Moderate Sensitivity – Moderate Significance. This indicates that these areas are of moderate importance and moderate vulnerability to alteration. RFP areas northeast of the Project mine site around Tatelkuz Lake are designated as Moderate Sensitivity – High Significance; this RFP overlaps with the freshwater supply system, which will run along an existing resource road. The area around Mount Davidson, as well as the area around two lakes southwest of the mine site (Lakes 01682LNRS and 01538UEUT), are also designated as Moderate Sensitivity – High Significance (RISC 1998). Waterways within the Mount Davidson area RFP do not interact with Project components or activities. There are minor Project activities proposed for fish habitat compensation which will affect waters, including the two small isolated lakes (Lakes 01682LNRS and 01538UEUT), as described in Section 1.4.4. As shown in Figure 1.3-6, the proposed transmission line crosses Moderate Sensitivity – High Significance, Moderate Sensitivity – Moderate Significance, as well as Low Sensitivity zones. No project areas intersect High Sensitivity zones.

It is not known which values specific to recreational navigation along waters were factored into the above RFP designations as they combine both land and water values. New Gold has undertaken further analysis, including stakeholder consultation to clarify any navigational aspects of the recreational access and use of waters in and around the Project mine site footprint (Table 3.1-2).

Commercial Land Use

The footprint of the Project contains no water lots and does not overlap with any private or federal Crown land, although the main proposed transmission line route overlaps with some parcels of surveyed provincial Crown land (New Gold 2012). A variety of tenures associated with quarrying, industrial, residential, environment, institutional and communication overlap the transmission line and FSR areas. The history of industrial activities in the area surrounding the Project mostly includes forestry (e.g., network of logging resource roads and associated cleared patches can be seen in Figure 1.3-3), though no active forest tenures overlap the Project footprint. The Kluskus-Ootsa FSR is an existing road that was built in 1975 to service the forest industry at that time (AMEC 2013e). Various agricultural lands are also found in the Vanderhoof District but not in the Mine Site area (AMEC 2013e).

Some smaller commercial ventures operate in the Project region. The Project footprint, including the proposed transmission line, overlaps with range, trapline, and guide outfitting tenures as described in

the Non Traditional Land Use report for the Project (AMEC 2013e). No commercial hunting and fishing lodges overlap with the mine site area; the Tatelkuz Lake Resort is the closest lodge to the mine site (Figure 1.3-4).

1.3.2.2 Current Use of Lands and Resources for Traditional Purposes

Regional Traditional Land Use

Information on current use of lands and resources for traditional purposes (including navigation) in the Project mine site region by Aboriginal groups has been collected through a combination of desk-based research, field studies (such as archaeological work), and consultation and engagement activities. The Project is located within the asserted traditional territories of the Ulkatcho First Nation, the Lhoosk'uz Dene Nation, and Skin Tyee Nation. The transmission line right of way crosses the asserted traditional territories of the Nadleh Whut'en First Nation, Nazko First Nation, Stellat'en First Nation, and the Saik'uz First Nation. There are a number of Indian reserves and Aboriginal communities in the vicinity of the Project area (Figure 1.3-7); Tatelkuz Lake Indian Reserve (IR) #28 is located approximately 17 km northeast of the Mine Site and is the closest IR to the Project footprint (Figure 1.3-5).

There is a well-established history of travel or transport on waterways by Aboriginal groups to engage in traditional activities; this includes accessing hunting, fishing, trapping, or plant gathering sites and areas; trade or communication with other groups; and for other cultural purposes. Navigation by Aboriginal groups in the Project area is supported by the linguistic evidence that they are primarily speakers of the *Dakelh* language, which means "people who travel upon water" (CSTC 2011). Dakelh territory was traditionally based on an extended family structure, with each family having rights to a family territory (*Keyoh*), consisting of hunting, gathering and fishing grounds. After European contact, when Aboriginal groups were made to live on reserves, they were unable to maintain the same level of management and use of the Keyoh. In 1926, the BC government introduced a system of traplines that roughly correspond to the Keyoh, so that these family territories continue to provide a sense of connection to the land; however, use of traplines has declined in recent years (AMEC 2013d).

Traditional travel by Aboriginal groups in the Project region involved a combination of land trails as well as some water routes via canoe. Land trails, or "Grease Trails", were used to transport goods such as eulachon oil for trading over vast areas. Many of the Grease Trails became trade routes used by Euro-Canadians in the fur trade period, later to become contemporary roads. The Nuxalk-Carrier Grease Trail (also used by Alexander Mackenzie and called the Alexander Mackenzie Heritage Trail) is in the Mount Davidson area, and is one of the most well-known Grease Trails in BC (Mackenzie 1970; Blacklaws 1979). This trail stretches from the confluence of the Fraser and Blackwater rivers in the interior near Quesnel, to Bella Coola on the coast, a distance of 420km; however, it is south of the Project area, and will not interact with Project components (Figure 1.3-4). Another well-known trail in the area is the Messue Wagon Road Trail (Figure 1.3-4), that runs along the west side of Tatelkuz Lake (AMEC 2013a). Of all these traditionally used Grease Trails, the Messue Trail is the closest to the Project mine site, and is traversed as a land rather than water route.

Traditional Use in the Project Mine Site Area

Available literature is limited on the traditional use of waterways by Aboriginal groups people in the Project area and surrounding vicinity, so two traditional land use studies were conducted for the Project to supplement desk studies.

Use of smaller waterways for travel or transport in BC is seasonally limited due to winter freezing. Historic and ethnographic research has focused on the West Road (Blackwater) River (running parallel to the Nuxalk-Carrier trail), which was a transportation corridor used and inhabited by several Southern Carrier bands, but outside of the Project footprint.

PROJECT # 0215644-0002 GRAPHICS # BWG-0002-005_T January 7, 2014

330000 360000 390000 420000 450000

6000000 5970000 5940000 5910000 30000

N

Ellis Island Ecological Reserve
Drywilliam Lake Ecological Reserve
Beamont Provincial Park
Endako
Endako
Stellako
Fraser Lake
Fraser Lake
Nadleh Whuten
Fort Fraser
Nechako River
Engen
Engen
Nechako Floodplains
Stuart River Park
Stuart River
Vanderhoof
Weneez
Sinkut River
François Lake
Francois Lake Protected Area
Savory Ridge
Stellako
Fraser Mountain 1053m
16
Cheslatta Carrier
Danskin
Skin Tyee
Uncha Mountains Red Hills Park
Francois Lake Park
Nithi Mountain 1352m
Nithi Rd
Smith Creek
Smith Creek Rd
TELEGRAPH TRAIL
Tachick Lake
Saik'uz
Lakes Rd
Nulki
Nulki Lake
Uncha Lake
Takysie Creek
Nithi River
Binta Lake
Holy Cross FSR
Tahultzu Lake
Nechako River
Mount Greer 1247m
Mapes
Giscuiz Lake
Giscuiz Creek
Khtada
Sinkut Mountain FSR
Sinkut River
Corkscrew
Sinkut Mountain 1404m
Hallett Lake
Holy Cross Mtn 1425m
Knapp Creek
Cheslatta River
Greer Creek
Targe Creek
Kenney Dam Rd
CHESLATTA INDIAN TRAIL
Nulki Hills
Nulki Peak 1527m
Meridian Road (Vanderhoof) Ecological Reserve
Cheslatta
Bird Creek
Nechako Canyon Protected Area
Kenney Dam
Cutoff Butte 1095m
500 Road
Lucas Lake
Lucas Creek
Knewstubb Lake
Big Bend Creek
Kluskus-Red
Finger Lake
Chilako River Ecological Reserve
Kluskus-Gold
Tatuk Lake
Finger Tatuk Park
Chilako River
Nechako Range
Natalkuz Lake (Nechako Reservoir)
Tetachuck River
Entiako River
Mount Swannel 1768m
Fawnie Nose 1926m
Chedakuz Creek
Kluskus-Euchino
Tatuk Creek
Batnuni Lake
Euchiniko River
Nataniko Creek
Kluskus-Chedakuz
Tatelkuz Lake
Tatelkuz Mountain 1611m
Entiako Park
Entiako Lake
Top Lake
Kluskus-Ootsa FSR
Fawnie Range
MESSUE WAGON ROAD TRAIL
Kluskus-Messue
Chedakuz Creek
Kuyakuz Mountain 1734m
Kluskus-Blue FSR
Kuyakuz Lake
Nazko
Kluskoil Lake Park
Euchiniko
Tweedsmuir Park
Johnny Lake
Fawnie Creek
Mount Davidson 1856m
Moose Lake
Tsacha Mountain 1781m
Euchiniko Lakes
West Road (Blackwater)
Kluskus
Baezaeko
Kushya
Tsacha Lake
Nazko
TOM BAPTISTE WAGON TRAIL

Legend

- Community
- Highway
- Existing Transmission Line

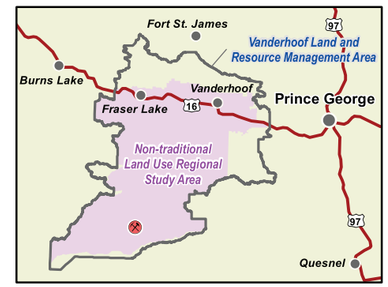
Forestry Service Roads
- Kluskus FSR
- Kluskus-Ootsa FSR
- Other FSRs

Project Components
- Exploration Road
- Proposed Mine Access Road
- Proposed Water Pipeline Route
- Proposed Transmission Line
- Proposed Mine Site

Recreation Features Inventory

Sensitivity and Significance Rating
- High sensitivity, very high significance
- High sensitivity, high significance
- Moderate sensitivity, high significance
- Moderate sensitivity, moderate significance
- Low sensitivity, high significance
- Low sensitivity, moderate significance
- Low sensitivity, low significance
- Unknown

Non-Traditional Landuse
- Regional Study Area
- Local Study Area



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Reference

BC Government GeoBC Data Distribution
NRCAN Geobase
Ministry of Forests, Lands and Natural Resource Operations

Source: Amec, 2013.

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Figure 1.3-6

Blackwater Project: Sensitivity and Significance Rating for Recreation Areas in Project Region

Figure 1.3-7

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Blackwater Gold Project
Aboriginal Setting and First Nation Reserve Locations

Figure 1.3-7

Rescan an ERM company

Tatelkuz Lake IR# 28 is the closest IR located to the Project site (Figure 1.3-5). One family has resided on IR #28 since 1957 (approximately three Lhoosk'uz Dene members and one non-member). An interview conducted with an elder living at IR 28 indicated that this reserve is "off-grid," meaning there is no road access or services (AMEC 2013d), although there are some rudimentary rough muddy routes (Interviews with Lhoosk'uz Dene Elders, 2013). The family residing at IR #28 do not participate in the mainstream economy, and are dependent on the traditional economy for survival, including fishing in the lake.

Canoeing and boating were once popular activities on Tatelkuz Lake; elders noted that historically the lake would attract people from Saik'uz First Nation and Lhoosk'uz Dene, but now residents of IR 28 are the primary users of the lake, mostly for fishing, including by canoe (AMEC 2013d). Elders noted that fishing in lakes (mostly in the spring) near IR 28 is preferable to fishing in the rivers; though some report having fished on lower Davidson Creek as well (Interviews with Lhoosk'uz Dene Elders, 2013).

1.3.2.3 Summary

Navigation is part of the public (commercial, recreational, and Aboriginal) use of lakes, rivers and streams in the Project region; however, use of waters transected by Project components has primarily been on larger bodies of water such as the Nechako and Stellako rivers as well as Tatelkuz Lake.

1.4 PROJECT DESCRIPTION

The full Project Description for the Blackwater Project is provided in Chapter 2 of the Application/EIS, while a summary of the main components of the Project that relate to navigation is provided below. More detailed discussion on how Project components interact with water across the life of the Project is provided in Section 2.3. Aside from the open pit, which must be developed at the site of the Blackwater ore deposit, the location of Project components have been optimized to minimize the risk of impacts to the surrounding environment, including surface water, such as limiting surface water control requirements (AMEC 2014).

1.4.1 Project Schedule

The Project development schedule, consisting of construction, operation, closure and post-closure phases is shown in Table 1.4-1. Construction is anticipated to last two years (2005 to 2017), while the operation phase is expected to continue for 17 years (2018 to 2035). The closure phase will start once operations are finished, and likely last from Year 18 to 34; the post-closure phase will start in Year 35 and be ongoing.

Table 1.4-1. Blackwater Proposed Project Development Schedule

Phase	Length (Years)	Project Year
Construction	2	-2 to -1
Operation	17	1 to 17
Closure	18	18 to 34
Post-closure	Ongoing	+35

Source: AMEC (2014)

To support mine development, requisite water, waste rock and tailings management infrastructure will be built on the mine site. The TSF area will include components such as dams, ponds, tailings beaches, borrow areas, tailings pipelines, and water diversions. Linear components of the project that run off-site include the MAR, freshwater supply pipeline, and a proposed transmission line. Figures illustrating the development of components over the life of the Project spanning the construction, operation, and closure/post-closure phases are shown in figures in Appendix B.

1.4.2 On-site Project Components

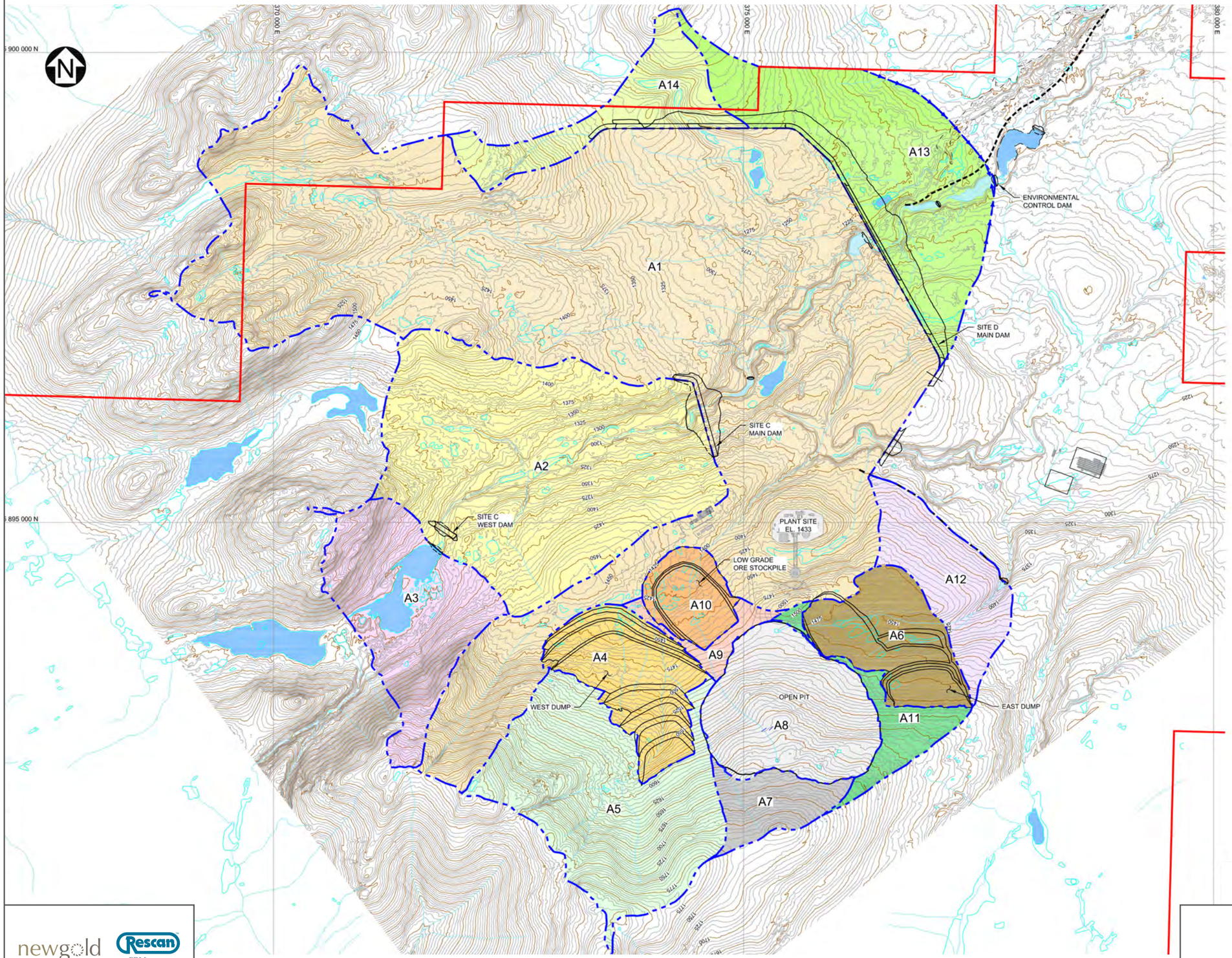
The Project is centered on the mine site, where open pit ore extraction and associated processing activities will take place. The Project mine site footprint occupies a surface area of approximately 4,400 ha; given the nature of the ore body, open pit mining has been deemed as the only feasible means of extracting ore for the Project. Project components, including infrastructure and facilities, are listed in Table 1.4-2.

Table 1.4-2. Blackwater Project On-site Components and Facilities

Project Component or Facility	Dimensions and/or Capacity
Mine Site	Approximately 4,400 hectares (ha) and accommodates all mine, ore processing, mine waste, water supply and management, and on-site infrastructure
Open Pit	Approximately 238 ha footprint, with anticipated depth of 550 meters below ground surface (mbgs)
West Waste Rock Dump	Approximately 172 ha site to store 87 Mt of NAG 4, NAG 5 and overburden with an elevation of 1,535 meters above sea level (masl) (160 m high)
East Waste Rock Dump	Footprint of approximately 158 ha to store 50 Mt of Type 5 NAG and overburden with an elevation of 1,590 masl (105 m high)
Low Grade Stockpile	Footprint of approximately 76 ha to store 50 Mt of low-grade ore
Construction Laydown	Occupies approximately 31 ha
Construction Camp	8 ha with the capacity to accommodate 1,000 to 1,500 personnel during construction phase
Truck Shop	Occupies approximately 6 ha
Tailings Storage Facility (TSF)	Footprint of approximately 1,117 ha comprising Site C, which occupies 192 ha and Site D, which occupies 925 ha. The maximum elevation of the main dam for Site D is 1,339 masl (149 m high). The TSF is designed to store a total of 784 Mt of both tailings and Potentially Acid Generating (PAG) waste rock.
Freshwater Reservoir	To supply freshwater for the Project water needs, the freshwater reservoir will be developed downstream of Site D of the TSF on Davidson Creek with a storage capacity of approximately 400,000 m^3, and a 14 m embankment height
Plant Site	Approximately 35 ha at elevation of 1,425 masl, site with industrial buildings (including crusher and conveyor) to process 60,000 tpd (22 Mt/y) of ore and produce 7.07 Moz Au and 30 Moz Ag
Operations Camp	Approximately 5 ha to accommodate up to 400 personnel
Topsoil Stockpile	Approximately 10 ha distributed in two locations within the mine site
Borrow Areas	73 ha comprise 30 ha for the Site C main dam and 43 ha for the Site D main dam; also include a sand and screening plant

Notes:
ha = hectare; km = kilometre; m = metre; masl = metres above sea level; mbgs = metres below ground surface; Mt = million tonnes; Mt/y = million tonnes per year; NAG = non-acid generating; PAG = potentially acid generating.
Sources: AMEC (2014) and Knight Piésold Ltd. (2013a)

Excavation for the mine will take place in the open pit, which will be backfilled with approximately 8 Mt of material during the final year of mining. Flanking the open pit will be two waste rock dumps, the West dump and the East dump. The TSF (Figure 1.4-1) will have tailings ponds broken into two main sites: (1) Site C, flanked by the Site C West Dam and Site C Main Dam; and (2) Site D, flanked by the Site C Main Dam and the Site D Main Dam. The mine site will also contain a low grade stockpile, construction laydown, construction and operations camps, a truck shop, the process plant site, and topsoil stockpile. Ancillary structures to support the mine site components will include a freshwater reservoir, water diversion ditches, and sediment/environmental control dams (Figure 1.4-1; AMEC 2014).



ID	CATCHMENT AREA (m²)
A1	23,493,258
A2	7,203,864
A3	2,745,670
A4	1,716,662
A5	4,041,717
A6	1,584,807
A7	778,163
A8	2,380,000
A9	308,576
A10	759,710
A11	701,996
A12	1,507,979
A13	4,143,515
A14	1,567,691

LEGEND:

- CATCHMENT AREA A1
- CATCHMENT AREA A2
- CATCHMENT AREA A3
- CATCHMENT AREA A4
- CATCHMENT AREA A5
- CATCHMENT AREA A6
- CATCHMENT AREA A7
- CATCHMENT AREA A8
- CATCHMENT AREA A9
- CATCHMENT AREA A10
- CATCHMENT AREA A11
- CATCHMENT AREA A12
- CATCHMENT AREA A13
- CATCHMENT AREA A14
- CATCHMENT BOUNDARY
- NEW GOLD PROPERTY BOUNDARY

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

Source: Knight-Piesold, September 2013

newgold Rescan an ERM company

Figure 1.4-1

Blackwater Project Mine Site Catchment Area Plan

The mine site footprint overlaps with the upper reaches of Davidson Creek and several tributaries including creeks 688328 and 704454. Reaches 6 to 11 of Davidson Creek (Figure 1.3-2) fall within the mine footprint, and reach 6 is the first place where dams will be built on the creek to form the fresh water reservoir. The main TSF dam will affect Davidson Creek at about Reach 9, and the TSF and other components affect upper Davidson and its tributaries up to Reach 11 where the Site C saddle dam demarcates the end of the TSF. The terrain within the TSF footprint is generally gently inclined, except along the incised portions of Davidson Creek between the site of the proposed Site C Main Dam and the Site D Main Dam, where the slopes adjacent to the drainage are moderate to moderately steeply inclined (AMEC 2014). While the rest of the mine site area lies within the Davidson Creek watershed, the open pit and East waste rock dump overlap with the catchment of Creek 661 (Figure 1.3-2).

To support the development of the mine on-site, the Project will involve components to manage water. The fresh water requirements for the design of the water supply systems include: Davidson Creek instream flow needs (IFN) and flushing flows; mill fresh water requirements; reclaim water; and, additional water for flooding waste rock in the TSF (if required). A freshwater reservoir will be required to provide storage capacity sufficient to meet IFN requirements and to provide water for flushing flows in Davidson Creek. The freshwater reservoir will be created by constructing an embankment dam approximately 14 m high along Davidson Creek downstream of the TSF (Appendix B mine site development figures). This dam will be the first point where the Project will block Davidson Creek, preventing any access past this point up the original channel of this waterway. The dam will have a maximum storage capacity of 400,000 m^3. Discharge from the reservoir to Davidson Creek will occur from a screened intake assembly through a concrete encased 24" diameter steel pipeline with a filter diaphragm and seepage control drainage system along the base of the pipeline. The discharge pipeline at the downstream toe of the dam bifurcates to two pipelines: a 6" steel pipe for the IFN flows and a 24" steel pipe for the flushing flows (channel maintenance). Release of water through the discharge pipeline will be controlled by a Temperature and Flow Control System (TFCS). The TFCS enables discharge flows into Davidson Creek to be controlled as much as practical to match the required flow and desired water temperatures (Knight Piésold Ltd. 2013a, 2013e).

The majority of fresh water requirements for the Project will be sourced from Tatelkuz Lake, which is located approximately 20 km northeast of the mine site (see Figure 2.2-1). Water will be provided to the Project from the lake via a freshwater supply pipeline which is described with off-site components in Section 1.4.3. Water management for the Project that may affect flow in downstream reaches is described further in Section 1.4.4 leading to flow changes described in Appendix D, Section 3.1.1.3.

1.4.3 Off-site Project Components

Table 1.4-3 lists Project components and infrastructure that are completely or largely located off of the mine site, including the proposed transmission line, the MAR, the freshwater supply system, and airstrip. Off-site Project components are briefly described in the following sections.

1.4.3.1 Transmission Line

A transmission line of 230 kV connecting the mine site to an existing substation south of the community of Endako will be required to provide power to the Project (see Figure 2.2-1). The proposed transmission line will be approximately 133 km long, with a right of way that is 40 m wide. A total of 148 potential waterway crossings were surveyed in the field (Section 2.4), including the Nechako and Stellako rivers (Figure 1.3-1). Design and construction of the transmission line will meet requirements of the standard *Overhead Systems* CAN/CSA-C22.3 No 1-10. Of the 148 aerial cable crossings included in the transmission line route (including alternative routes), 52 were found to be streams that were scoped into the navigable waters assessment (following the method described in Section 2, with results presented in Section 3.1), while 96 were found to be no visible channel (NVC; listed in Appendix A) and scoped out of the assessment.

Table 1.4-3. Blackwater Project Off-site Components and Infrastructure

Project Component or Facility	Dimensions and/or Capacity
Transmission Line	Occupies approximately 550 ha – 133 km long, 230 kV line over a right-of-way (ROW) 40 m wide
Mine Access Road (MAR)	Starting at km 124 of the Kluskus-Ootsa FSR and occupies approximately 28 ha – 15 km long over a right of way 20 m wide
Freshwater Supply Pipeline	Freshwater requirements will be met by pumping water from Tatelkuz Lake via a pipeline to the water reservoir downstream of TSF dam D. This water will be used for ore processing and flow maintenance in Davidson Creek. The pipeline will be placed adjacent to a road approximately 5 m to 10 m wide, depending on local ground conditions. The pumping station will be located on the shores of Tatelkuz Lake, and during construction, a laydown area will be required to support the construction activities. It is anticipated that the area required for the pumping station will be approximately 100 m x 100 m.
Airstrip	An approximately 2 km long and 200 m wide airstrip will be built in the proximity of the mine site with location selected in consideration of existing land use, access, and environmental conditions.

Notes: ha = hectare; km = kilometre; m = metre; kV = kilovolt; ROW = right-of-way.
Source: AMEC (2014)

Alternative routes are being considered for two portions of the transmission line. The Stellako re-route (with three crossings—SR-003, SR-004, and SR-009—illustrated in Appendix D, Figure 3.1-7) would use the BC Hydro ROW to take advantage of the existing Stellako River crossing. The Mills Ranch alternative bypasses the Mill Ranch with four crossings (Appendix D, Figure 3.1-3): MR-002, MR-003, MR-004, and MR-010.

1.4.3.2 Mine Access Road

Current access to the Project is by road from Vanderhoof via the Kluskus-Ootsa FSR originating at the community of Engen (approximately 20 km west of Vanderhoof) and an existing 18 km exploration road (Figure 1.3-1). New Gold will close this existing road as it traverses Ungulate Winter Range (UWR); the road will be used as an emergency egress access route for mine site personnel and public access will be blocked. The existing Kluskus-Ootsa FSR will require upgrading at one crossing location between km 102 and 124 (see Appendix D: AE-914 in Table 3.1-13 and Figure 3.1-3); other portions of this road that do not require upgrades are not scoped into the navigable waters assessment since they will not involve new works.

A new 16 km long mine access road (MAR) will replace the existing exploration access road to the site. The MAR route will cross the Davidson Creek and Turtle Creek Watersheds (Figure 1.3-2), originating at 123+973 km on the Kluskus FSR and extend south to the mine site. Some sections of the water supply pipeline and the power transmission line will parallel the MAR. The road right-of-way will therefore be wide enough to accommodate these structures. The water supply line joins the road right-of-way approximately 7.2 km from the mine site, and the transmission line parallels the road right-of-way all the way from the Kluskus-Ootsa FSR (AMEC 2014).

The MAR will be used for heavy traffic during mine construction and has been designed for year-round all-weather access. The road will be 10 m wide, two-lane, have a design speed of 60 km/h, and incorporate the bridges listed in Table 1.4-4 that will cross water channels[2]. The road design includes ditching to control erosion as well as culverts and cross drains as required. The detailed design of the

[2] There is a Bridge 5 (ID AP-001), but it is over a no visible channel (NVC) area, so is scoped out of this assessment (Appendix A)

road has been completed, and drawings have been issued for construction, which are included in the engineering drawings of Project works in Appendix B. (AMEC 2014)

Table 1.4-4. Blackwater Project Mine Access Road Bridges

Bridge	ID	Location	Length (m)	Water	Description
Bridge 1	AP-007	0.5 km	18.3	Turtle Creek	Steel concrete composite on precast spread footing
Bridge 2	AP-005	5.2 km	13.0	Unnamed Creek	Slab girder bridge on precast spread footing
Bridge 3	AP-004	6.7 km	18.3	Davidson Creek	Steel concrete composite on precast spread footing
Bridge 4	AP-905	10.3 km	14.0	Unnamed Creek	Slab girder bridge on precast spread footing

Source: AMEC (2014)

1.4.3.3 Freshwater Supply Pipeline

To fulfil the on-site water requirements, freshwater will be pumped from Tatelkuz Lake to the mine site via a proposed 13.6 km water pipeline, which will run along an existing 11.7 km resource (pipeline) road (illustrated in Appendix B). This road will require one bridge upgrade at km 10.7 where an existing log stringer bridge will be replaced with a 20 foot span bridge. Two existing culverts along this road are also planned to be replaced with bridges. At km 6.1, a 500 mm culvert will be replaced with a bridge, and at km 9.4 a 1200 mm culvert will be replaced with a bridge; both bridges are anticipated to be 20 foot clear span bridges.

The fresh water supply system will include a wet-well structure and intake pipe at Tatelkuz Lake, a steel pipe (610 mm diameter for initial high pressure sections near the booster pump station, and 710 mm elsewhere), five booster pump stations (one between Tatelkuz Lake and the freshwtear reservoir), and the freshwater reservoir located within the mine footprint (Section 1.4.2). The pipeline will be buried with nominal cover of 600 mm of random fill. The pumping station will be located on the shores of Tatelkuz Lake, and during construction, a laydown area will be required to support the construction activities; engineering drawing for the pumping station are provided in Appendix B. The water intake pipe will be 61 cm (24 inches) in diameter and located approximately 6.5 m below seasonal lowest low water (Appendix B). To the maximum extent possible, the pipeline alignment will follow an established resource road to minimize further environmental disturbances (Knight Piésold Ltd. 2013d). The resource road will require upgrades to one bridge crossing (as identified above) and it is anticipated that pipelines will be buried at water crossings (Appendix B).

1.4.3.4 Airstrip

An airstrip will be built for the Project in the Turtle Creek watershed, approximately 15 km north of the mine site. The airstrip will occupy a previously cleared forestry cut block that is already serviced by roads, which will require little or no upgrade to service the airstrip (AMEC 2014). A new 5.5 km airstrip road will also need to be built to provide access to and from the airstrip, with the alignment shown in Appendix B mine site development figures. The airstrip itself will not interact with water. One stream crossing has been identified for the airstrip access road (Appendix B mine site development figures). This bridge should be a clear span bridge, as shown in the engineering drawings provided in Appendix B. Two crossings along this route were scoped out of the assessment as being NVC in the field (Appendix A).

1.4.4 Water Management: Flow Considerations

As mentioned (Section 1.4.2), the Project will have on-site freshwater requirements, which will be supplied via the freshwater supply pipeline which has been designed to source water from Tatelkuz Lake (Section 1.4.3). An assessment of hydrological parameters conducted by Knight Piésold Consulting

(Knight Piésold) for the waterways that will be affected by the water supply system, as well as the diversions and other water management for the Project, is summarized below.

1.4.4.1 Davidson Creek Watershed Water Diversions and Management

A key objective of the proposed Project design is to prevent surface water discharges from the mine site to adjacent streams during operations to minimize flow effects. Process and site drainage water will be collected and stored in the TSF and recycled for use in the mill. The freshwater requirement for the mill operation, with a production rate of 60,000 tonnes per day, is assumed to be 120 m^3/hr (Knight Piésold Ltd. 2013c). Drawing of Tatelkuz Lake's waters to maintain flow needs for fish in lower Davidson Creek may affect water flows through Reach 15 of Chedakuz Creek, between the outlet of Tatelkuz Lake and the confluence of Davidson Creek and Chedakuz Creek. Small changes in flow are predicted in the Creek 661 watershed due to the construction and rerouting of surface water by sediment control ponds. Hydrometric stations have been installed to collect flow data in order to calibrate the model used to predict the effects of the Project on these creeks. Results of predicted changes in flow volume as a result of the Project are provided in Appendix D, Section 3.1.1.3.

Streamflow in Davidson Creek will be affected by the construction and operation of the TSF and other components in the mine site. During the operation and closure phases of the Project there will be no discharge into Davidson Creek between the Site C and Site D dams. The following describes the general development of water management infrastructure in the Davidson Creek watershed.

The TSF Site C Main Dam will be constructed in the upper Davidson Creek watershed and will capture runoff from the upstream catchment A2, as shown in Figure 1.4-1 (KP Feasibility Study Water Balance 2013). Catchment A3, upstream of the TSF Site C West Dam, will be re-directed to the southwest away from TSF Site C by a cofferdam built in Year-2, permanently changing the existing watershed divide in this area. A cofferdam will be constructed on Davidson Creek within the TSF Site D Main Dam footprint as of Year -1 to capture runoff from catchment A1 and A14 (Figure 1.4-1). The accumulated water behind the TSF Site D cofferdam will then be pumped to the TSF Site C start-up pond beginning in the second quarter of Year-1.

The starter dam for the TSF Site D Main Dam will be completed at the start of operations in Year 1, and will start to capture runoff from the watershed areas of the West Dump (A4), East Dump (A6), and Low Grade Ore (LGO) Stockpile (A10), as well as the corresponding upstream catchment areas (A5, A9 and A11) and area downstream of the East Dump (A12). The Environmental Control Dam (ECD) will also be constructed in Year 1 to capture seepage and surface runoff (A13) from the TSF Site D Main Dam. The recoverable seepage and surface runoff will be collected at the ECD and pumped back to the TSF Site D during mine operations and into closure until the open pit is full and TSF Site D spills to Davidson Creek via closure spillway.

Water stored in the TSF Site C start-up pond will serve as the primary process water source at the start of mill operations until the end of Year 2, with additional water being drawn from the TSF Site D pond (via the pump system at the cofferdam), as necessary. Once tailings deposition in TSF Site D commences in Year 3, and until the end of mining operation in Year 17, the TSF Site D pond will be the primary source of process water. Additional make-up water, if required during this time, can be provided by the TSF Site C pond. The pond in TSF Site C, as of Year 3, will be allowed to accumulate naturally to the closure spillway elevation at or below 1346 m, and then overflow into the pond of TSF Site D in approximately Year 27. The fresh water required for the mill throughout mine operations and any additional process water that is required above what can be recycled by the TSF ponds and open pit dewatering will be sourced from the fresh water supply pipeline from Tatelkuz Lake.

Groundwater inflow and subsurface runoff to the open pit, including water from the vertical depressurization wells, will be collected and recycled for use in the milling process as of Year 1 to end of open pit mining in Year 15. Pit dewatering flows during operations may be directed to the TSF depending on water quality. The dewatering system will be decommissioned in Year 15 once open pit mining has ceased and the pit will begin to fill as low grade ore is being processed through the mill from Year 15 to 17. Once mill operations cease in Year 17, the surplus inflow to TSF Site D (inflow minus losses) will be pumped to the open pit to aid in pit filling. Once the open pit is full (predicted in Year 33), it will overflow via a spillway to the TSF Site D pond. The TSF Site D pond will overflow via the closure spillway to a plunge pool in Davidson Creek downstream of the ECD.

1.4.4.2 Fish Habitat Compensation Plans

Fish habitat compensation sites are planned for two headwater lakes and stream reaches southwest of the TSF Site C West Dam (Figures 1.3-2 and 1.4-1). To support fish habitat compensation, a second cofferdam will be constructed upstream of the Site C West Dam; the coffer dam will isolate a fish habitat compensation pond and channel that will be constructed between Lake 01682LNRS and Lake 01538EUET (which is in the Creek 705 catchment) (Knight Piésold Ltd. 2013a). The coffer dam will lead to flooding of reaches 12 and 13 (Lake 01682LNRS) of Davidson Creek, and the diversion channel will change direction of some flows from the upper Davidson Creek watershed towards the Creek 705 watershed, coupled with increased flows along this channel and in Creek 705. Results of predicted flow changes as a result of fish habitat compensation are provided in Appendix D, Section 3.1.1.3.

2. Methods

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2. Methods

2.1 INTRODUCTION

To support the assessment of potential effects on navigation of the Project in the Application/EIS, the navigation assessment generally asks if there is a work that interacts with a water that is on the NPA schedule, or is otherwise navigable. The determination of Project works (Sections 1.2.1.1 and 2.3) is relatively straight forward under the NPA. Since waters affected by the Project are not on the NPA Schedule of navigable waters, methods to determine the navigability of the unlisted waters affected by Project works based on jurisprudence criteria are described in Section 2.5.

New Gold may opt in to the NPA approvals process for those waters found to be navigable in this assessment. For Davidson Creek and other waters, which may be subject to s.22 of the NPA (Section 1.2.1.2), a similar conservative approach has been taken. The NPA as a whole, including s.22, only applies to navigable waters, so in the event TC determines that s.22 is applicable due to navigability of affected waters, then extra information to support a Governor in Council (GIC) exemption application under s.23 of the NPA is also provided in this report.

2.2 BASELINE STUDY AREA RATIONALE

The baseline study areas for the navigable waters technical assessment, including the Local Study Area (LSA) and Regional Study Area (RSA), are shown in Figure 2.2-1. The LSA was defined in conjunction with other aquatic disciplines' study areas, including hydrology. The boundaries of the LSA were selected following review of the location and size of the Project footprint and components, consultation with hydrologists, and an understanding of the potential Project effects on navigable waterways, including the potential for downstream flow effects.

For the purpose of describing navigable waters that may be potentially affected by the Project, the LSA was subdivided into the major Project on-site components (see Appendix D, Table 3.1-3; with works that directly affect waters on the mine site, or downstream from it from flow effects, as well as fish habitat compensation planned in upper Davidson Creek), and off-site components (see Appendix D, Table 3.1-13 with works including aerial crossings of the transmission line, bridges, buried pipeline crossings, and water intake pipes of the freshwater supply system). In and around the mine site, reaches and crossings sites were sampled (Figure 2.2-2). Sites that were part of the sampling program and later found to have no applicable Project works or NVC for both on- and off-site components are listed in Appendix A. Beyond the mine site, sample sites for components such as the transmission line and the MAR are listed in Table 3.1-13 and illustrated in Figures 3.1-3 to 3.1-8 in Appendix D.

2.3 IDENTIFYING AND SCREENING WORKS

To identify Project components that constitute works under the NPA definition (Section 1.2.1), a GIS analysis was conducted to determine the potential for interaction between Project works with water for representative Project phases (Appendix B, mine site development maps). Both direct (i.e., in, on, over, under, through or across) and indirect (i.e., downstream flow effects) interactions were considered and are shown in Table 2.3-1. Under the NPA Minor Waters Order (Transport Canada 2014b) the classes of the following Project works could be considered as minor (designated works) subject to the same criteria as the previous MWWO: aerial cables, pipelines, outfalls, and water intakes. As mentioned in Section 1.2.1.1, results of the screening of minor works assessment are reported in Appendix D; works deemed minor have been screened out of the assessment in this report.

As some Project components act as linked multiple "works" in the mine site, the water sampling points in Figure 2.2-2 were conservatively chosen to characterize reaches directly affected by works. Downstream reaches (with no works) of Davidson Creek have also been sampled and characterized, mostly towards assessing navigability of affected reaches relevant to applicability of s.22 NPA provisions on Prohibited Activities and the potential need for a s.24 application for a GIC exemption. Other downstream reaches affected by flow changes as a result of mine site activities have also been characterized where data is available to better assess navigability effects from flow changes in the Application/EIS. For linear Project components, each waterway crossing (i.e. one bridge), is considered to be a discreet work that will not likely substantively interfere with navigation, and only the channel section directly affected by the work has been assessed. Site maps and engineering drawings of works are provided in Appendix B.

2.4 IDENTIFYING POTENTIALLY NAVIGABLE WATERS

2.4.1 Field Sampling

To support the screening assessment of minor waters under the previous MWWO (2009) assessment as well as the determination of navigability under case law, waterways (i.e., streams, creeks, rivers, and lakes) potentially affected by the Project footprint were characterized with desk and field studies as part of the fish and fish habitat characterization field program (AMEC 2013b; Avison 2013). Field data were collected during site visits in the summer and fall of 2011 and 2012, and in the summer of 2013. The measurements and observations pertaining to navigable waters were collected based on the previous MWWO methodology. These measurements are considered applicable to the navigability assessment based on physical criteria in this report, as well as used for the MWWO screening conducted in Appendix D, and included the following:

- average bankfull width and bankfull depth of the waterway section;
- channel slope (gradient);
- sinuosity, measured as stream channel length/valley length;
- frequency of natural obstacles counted along a 200 m section, centred around the crossing point;
- estimations of flow levels, and distances over which these are maintained;
- substrate type relating to potential effect on navigability (i.e., weeds, boulders, shallow bars, etc.); and
- other impediments to navigation.

Measurements were taken over a 200 m stream section for each work-water interaction, with the exception of streams and tributaries within the mine site footprint, which were characterized by reach along the whole length of Davidson creek and in associated upper tributaries. While this is not required for the assessment of waterways affected by works per MWWO guidelines, this approach was taken as a best practices and precautionary manner in order to better characterize navigability of Davidson Creek due to the TC suggestion to take into account the potential applicability of s.22 and s.23 of the NPA (1985) to the Project, which would require a characterization of the waterways at the site of prohibited activities as well as downstream. Photograph plates of reaches are provided where possible. In some cases, due to access limitations, aerial photographs have been used instead of ground level photographs. A photographic series of all reaches along Davidson Creek is provided to help characterize the navigability of this waterway.

Figure 2.2-1

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Blackwater Gold Project Navigable Waters Study Areas

Figure 2.2-1

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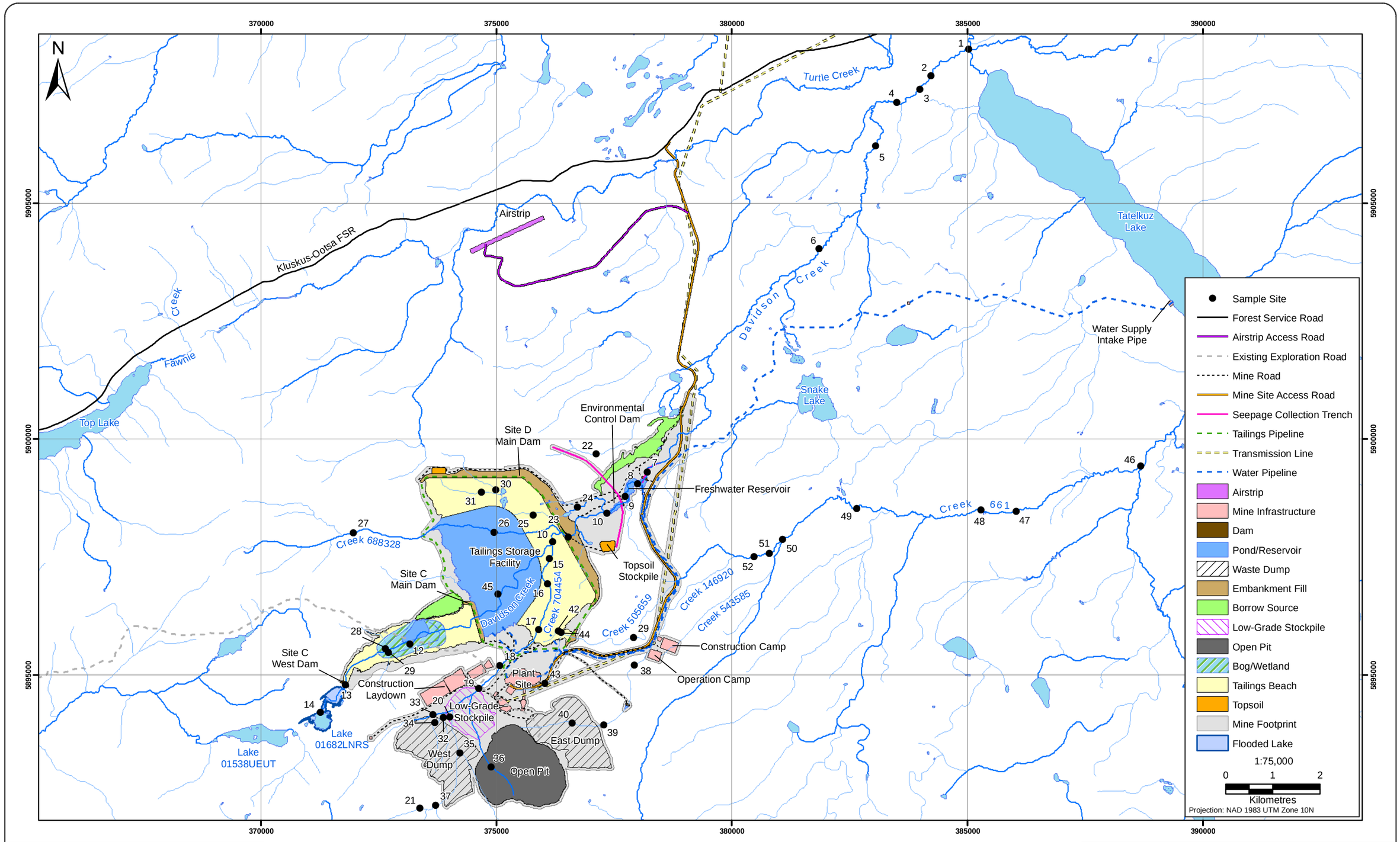

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Rescan an ERM company

Figure 2.2-2

Navigable Waters Sampling Locations near the Project Mine Site

Table 2.3-1. Blackwater Project Components by Phase and Potential for Interaction with Water

Project Region	Project Area	Project Component	Phase			
			Construction (Year -2)	Operation (Year 17)	Closure / Post-closure (Year 35)	Interaction With Water
Off-site	Access Routes	New Mine Access Road (MAR)	X	X	X	X
		Kluskus FSR Upgrades	X	X	X	X
		Airstrip Access Road	X	X	X	X
		Airstrip	X	X	X	
	Power Line	Transmission Line (133 km; 550 ha)	X	X	X	X
		Transmission Line - Mills Ranch Reroute*	X	X	X	X
		Transmission Line - Stellako Reroute*	X	X	X	X
	Water Supply	Tatelkuz Lake Water Supply Intake	X	X	X	X
		Water Supply Pipeline (20 km)	X	X	X	X
		Water Supply Pipeline Service Road	X	X	X	X
		Pump Station 3	X	X	X	X
		Pump Station 5	X	X	X	X
On-site	Mine Site Ore Excavation Area	Explosive Facilities	X	X	D	
		Low-Grade Stockpile (76 ha)		X	X	X
		Open Pit		X	D	X
		Dam Pond 1	X	X	X	X
		Dam 1	X	X	X	X
		Haul Roads	X	X	D	X
		East Dump (158 ha)		X	R	X
		West Dump (172 ha)		X	R	X
	Mine Site Ore Processing Area	Conveyor	X	X	D	X
		Crusher	X	X	D	
		Plant Sites	X	X	D	
		Plant Site Road	X	X	D	X
		Pump Station 5	X	X	X	
		Soil Stockpile	X	X	R	
		Truck Shop	X	X	D	
	Fish Habitat Compensation	Diversions and flooding	X	X	X	X
	Diversion Ditches West of Site C Dam	Diversion Ditches	X	X	X	X
	Construction Laydown Areas	Construction Laydown 1	X	X	D	
		Construction Laydown 2	X	X	D	
	Camps	Construction Camp	X	X	D	X
		Operation Camp	X	X	D	

(continued)

Table 2.3-1. Blackwater Project Components by Phase and Potential for Interaction with Water (completed)

Project Region	Project Area	Project Component	Phase			
			Construction (Year -2)	Operation (Year 17)	Closure / Post-closure (Year 35)	Interaction With Water
On-site *(cont'd)*	Tailing Storage Facility (TSF) Area (1,117 ha)	Fresh Water Reservoir Dam	X	X	R	X
		Fresh Water Reservoir	X	X	R	X
		Esker Borrow Source	X	X	R	
		Sand/Gravel Screening Plant	X	X	R	
		Top Soil Stockpile - North of Site D Dam		X	R	
		Topsoil Stockpile - East of Site D Dam		X	R	
		Site D Construction Sediment Control Dam	X	X	R	X
		Site D Sediment Control Pond	X	X	R	X
		Site D - Coffer Dam	X	D		
		Site D - Main Dam and Embankment (149 m high)		X	R	X
		Site D - Tailings Cell and Pond		X	R	X
		Site D - Tailings Pipeline		X	D	X
		Site C - Construction Sediment Control Dam	X	D		X
		Site C - Sediment Control Pond	X	D		X
		Site C - Center Dam and Embankment	X	X	R	X
		Site C - Center Dam Borrow Source	X	X	R	
		Site C - Tailings Cell and Pond	X	X/R		X
		Site C - Bog/Wetland Area		X/R		X
		Site C - Emergent Wetland Area		X/R		X
		Site C Tailings Pipeline		X	D	X
		Site C West Dam	X	X	R	X
		Seepage Collection Trench		X	X	X
		Water Diversion /Seepage Channel s		X	X	X
		Water Reclamation Pipeline		X	D	X

** One of two transmission lines presumed to be developed if the main transmission line is not chosen.*
X = Component is present; D = Component is decommissioned; R = Component is reclaimed

Sinuosity measurements could not be measured effectively at some sites (e.g., Davidson Creek), due to the large amount of blowdown common to mountain pine beetle (MPB) infested forests in the region (Avison 2013). The presence of MPB blowdown acts as an obstacle to navigation in multiple water bodies in the Project area. Although this blowdown may not be historically as prevalent, the number of trees obstructing streams may also increase in the future due to the presence of many infected trees still standing which are likely to eventually fall.

Figure 2.2-2 shows the sampling points deemed to be relevant to interactions with Project works in the mine site area. Data collected from 52 sampling sites was used to support the MWWO screening process, including data from all reaches of Davidson Creek, as well as several tributaries. Reaches 1 to 5 Davidson Creek are located downstream of the mine site, but were also surveyed (Section 2.3). The field data set is provided in Appendix A, including streams with NVC and field observations.

A total of 74 water crossings by linear features were identified beyond the Project mine site footprint. A total of 52 crossings along the transmission line, 4 along the Mills Ranch transmission line re-route, 3 along the Stellako re-route, four crossings along the proposed MAR alignment, one along the km 102 to km 125 Kluskus-Ootsa FSR upgrades, one along the airstrip access road, and nine along the freshwater supply system were screened against MWWO criteria for works and waters.

2.5 DETERMINING NAVIGABILITY OF WATERS AFFECTED BY PROJECT WORKS

An analysis of waters affected by the Project using criteria under the old MWWO was previously conducted, and is provided in Appendix D, as the field measurements and analysis is still considered relevant to the assessment of physical navigability of affected waters presented in Section 3.1. Field observations (including NVC reaches) are listed in Appendix A, and photos of waters are in Appendix C. The navigability of waters found to be non-minor in Section D (as well as minor reaches that may be subject to s.22 of the NPA) is assessed in this report based on the principles and criteria built up through jurisprudence based on physical criteria as well as public utility criteria as described below. The public utility criteria incorporated information gathered from stakeholder consultations for the Project.

2.5.1 Determining if a Waterway is Physically Capable of Public Navigation

One of the conditions of navigability that is often stated in case law is regarding whether a waterway section[3] is navigable in fact (*Coleman v. Ontario* [1983], affirmed in *Canoe Ontario v. Reed* [1989] and *IMC v. Canada* [1993]). In this sense, a waterway is navigable if it can be demonstrated to support navigation by floating vessels that may be as small as canoes or rafts from one point to another. This physical navigational capability may be observed in the field, found in desk studies, reported through consultation, or be surmised from the physical properties of the waterway.

The courts have also clarified that simply having a sufficient width and depth at certain times of the year doesn't necessarily make a water body navigable. The intent of the law is to protect the reasonable, normal, and regular public right of passage along waterways that can serve as aqueous highways for travel or transport. Therefore, *temporal* and *obstruction* factors need to also be considered.

2.5.1.1 Temporal Considerations

Navigation need not be continuous across all seasons in order for a reach to be considered navigable (*Coleman v. Ontario* [1983]); however, unless a waterway can be regularly used as an aqueous highway, beyond seasonal high flows of short duration (barring exceptions such as historic use in logging), then a waterway is not considered navigable (see *IMC v. Canada* [1993] and *Canoe Ontario v. Reed* [1989]). This is interpreted to mean that unless there is a historic precedent of navigational use during a certain limited seasonal range, navigable waters should support a regular, reliable means of aqueous travel or transport throughout most of the year, which for the Project means the ice-free months of the year.

2.5.1.2 Obstructions to Navigation

In general, if a waterway section is affected by conditions (such as being too shallow, clearly obstructed, or marshy) that would prevent or obstruct the passage of a floating vessel, then that section would not be considered capable of navigation. In this way, a river or creek section that is navigable along certain parts may also be construed to not be navigable along other parts (*Coleman v. Ontario* [1983]).

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[3] In the following sections, following the MWWO (2009) methodology, a waterway section or reach is defined as the mid-point of interaction with a proposed work, spanning about 100 m upstream and downstream on average, or may also be a reach.

In the case where passage along a waterway is obstructed, the type and nature of the obstruction is important. If a waterway section is otherwise navigable, the section is not necessarily rendered not navigable because of the existence of an interruption to passage or obstruction (such as rapids or an existing dam), which could be portaged around or conceivably removed (*Coleman v. Ontario* [1983])—especially if there is a historically established use for navigation. This principle was upheld in *Canoe Ontario v. Reed* [1989], where it was determined that, where the existence of a single obstruction on a waterway (temporarily or permanently) prevents passage, the historically established public right of navigation on the waterway still remained, even though it might not actually be feasible to carry out in the particular location of the obstruction. Note that in the case of an obstruction requiring portage, if there is a right of public navigable passage along a water, this does not then also lead to the public right to portage on the land surrounding the obstruction.

Although a waterway may be navigable even though it may have an obstruction to passage, if a waterway has no historic or current record of use, and the ability to physically transit the waterway as an aqueous highway is met with *multiple* obstacles which would make passage onerous, then the waterway would reasonably not be considered navigable. In a similar manner as with temporal interruptions to use, if the bulk of the evidence indicates that the waterway is predominantly and regularly characterized by obstructions that bar regular and reliable public use, then the waterway could not reasonably serve as an aqueous highway. The interpretation of obstruction criteria for this Project is that, for a waterway section with no established utility for navigation, if it has three or more obstructions to passage it is considered *not navigable*.

2.5.2 Determining Navigability Based on Public Utility

Along with having the appropriate physical criteria, a waterway must also be able to serve as an aqueous highway that is of reasonable public utility leading to some sort of social benefit of navigation (*Coleman v. Ontario* [1983]; *Canoe Ontario v. Reed* [1989]); *IMC v. Canada* [1993]). The navigational use may be for various purposes including for commercial, recreational, or Aboriginal subsistence travel or transport, or as a communications link. Public utility for navigation is considered to be established if there is historic or current use of a waterway for public transit or travel.

If a given waterway meets the physical criteria to support navigation, but has no established navigational use, then further criteria are required to speak to the waterway's ability to be of reasonable appeal for public use as an aqueous highway. These final criteria include the *accessibility* and *connectivity* of the waterway (*IMC v. Canada* [1993]), which are the prerequisites underlying the ability of a waterway to serve as an aqueous highway for public travel or transport. If a waterway is not accessible (i.e., it does not meet the access and connectivity criteria outlined in the next section), then it is not likely to be considered navigable under common law.

To investigate the public utility for navigation of a given waterway, proponents of a proposed work can consult with potential users in the area in order to ascertain whether the waterway has any commercial, recreational or Aboriginal use (in the past, present or reasonable future). If there is reported use, further details on the when, how, where and for what kind of purpose the water is used also speak to whether it is of reasonable social benefit for navigation.

2.5.2.1 Public Access and Connectivity

The ability of the public to be able to access both ends of a waterway has been used in case law as a precondition to the navigability of a waterway. As stated by Justice Doherty in *Canoe Ontario v. Reed* [1989]), "If the waterway serves, or is capable of serving, a legitimate public interest in that it is, or can be, regularly and profitably used by the public for some socially beneficial activity, then, assuming the waterway runs from *one point of public access to another point of public access*, it

must be regarded as navigable and as within the public domain." (Emphasis added.) In this interpretation, if a physically navigable waterway connects two places that are publically accessible, then it could be considered navigable. The concept of accessibility was expanded upon in *IMC v. Canada* (1993) where Justice Mackay framed access in terms of reasonable public appeal, stating that the concept of an aqueous highway implies "that the waters connect places which in the normal course would facilitate travel, even recreational travel, on a route that would have a likelihood of reasonable appeal to members of the public as a route to be travelled." Note that, as with previous criteria, the court justices utilize the terms "regular", "normal", and "reasonable" to characterize the public use for navigation.

The concepts of access and reasonable public appeal to access a waterway are also linked to that of connectivity of the waterway to a larger network of transport. The concept of navigable waters serving as aqueous highways linking into a larger network, including maritime shipping routes, dates back to the origin of the NPA and the public right of navigation in Canada (*IMC v. Canada* [1993]; *Coleman v. Ontario* [1983]). This principle of connectivity to a navigational network is elaborated on in *IMC v. Canada*, which found that, "Certain navigable systems form a critical part of the interprovincial transportation networks which are essential for international trade and commercial activity in Canada", and that for this reason, navigable waters are also "more than a small pond or lake isolated from other waters" (1993).

From the above cases it is inferred that for the waterways affected by the Project that may be found to be physically navigable, that unless they are also publically accessible and forming part of a larger system of connectivity for travel or transport, that the waterway sections are not likely navigable waters under the jurisprudence interpretation. Note that a waterway is typically understood to be navigable if it is used for transportation purposes along the waterway, but if a water is used for private purposes, or for uses that don't require transport along it (i.e., fishing), then it is not necessarily rendered navigable from this usage (*Canoe Ontario v. Reed* [1989] and *Coleman v. Ontario* [1983]).

2.5.3 Checklist to Determine Navigability Based on Jurisprudence

Based on case law principles and criteria discussed above, the following questions have been compiled to provide a general checklist to inform the method of assessing navigability of Project waters for the purposes of this report based on jurisprudence. This checklist is applied in a tabular format in Section 3.1 (Table 3.1-1) to clearly and transparently communicate New Gold's assessment of navigability for waters identified for further assessment in Appendix D.

- To what degree is the water section reasonably physically capable of supporting navigation by floating vessels (as small as canoes or logs) along its length? The following considerations are taken into account:
  - Is the waterway section capable of regular, reasonable navigational use most of the year, or only intermittently, such as during times of high water?
  - If there are obstructions, are they few and far between (such that it would be feasible to portage around them) or is the waterway instead characterized by repeated or regular obstructions? Three or greater obstructions along a waterway section is considered sufficient to render the reach characterized by obstructions rather than clear passage.
  - If there are obstructions, are they recent modifications to a waterway that otherwise has a precedent of public use for navigation? Historic precedence takes priority when determining navigability, as a waterway that has been altered from an earlier navigable state could be rendered navigable again with upgrades.

- Does the waterway section have a demonstrated public utility as an aqueous highway? To assess, the following considerations are taken into account:
  - What does the consultation record reveal about the current, historic or future intended use of the waterway?
    - What kind of vessels does the consultation indicate that the waterway section has or is capable of being navigated by?
    - What social benefit (i.e., commercial, recreational and Aboriginal traditional use) does the consultation record indicate the waterway section has been or is used for?
    - During what times has the waterway section been navigated?
- Is the waterway accessible for use by the public as an aqueous highway? To assess, the following considerations are taken into account:
  - Does the waterway section span from one point that is publically accessible to another point that is publically accessible?
  - Is the waterway of reasonable public appeal to access for commercial, recreational or Aboriginal travel or transport?
- Is the waterway an aqueous highway that is connected to a transportation network? To assess, the following considerations are taken into account:
  - Is the water connected to an established route of transport by land, air or water?
  - Is the water more than a small pond or lake that is isolated from other waters?

2.5.4 Stakeholder Consultation

To support the determination of navigability of non-minor waters affected by the Project, information on current and/or historical use of watercourses and waterbodies within the Project LSA was obtained through consultation with Aboriginal groups and other stakeholders. A list of individuals and organizations that potentially use the local water courses for recreation, transportation, or commercial purposes was prepared. Each individual or organization was contacted by phone and/or e-mail and provided with relevant Project information. The type of information collected included which watercourses and waterbodies stakeholders use, for what type of activities (canoe, kayak, boat, float plane, swimming), and during what season. Stakeholders were contacted between March 13 and April 3, 2013. Information gathered during consultation activities relevant to navigation of waters in and around the Project footprint is compiled in Section 3.1, Table 3.1-2.

How the information in Table 3.1-2 applies to individual waters that will be affected by the Project is described in Section 3.1. In general, stakeholders have reported that they use the following waters that will be affected by the Project for navigation: Tatelkuz Lake, and the Nechako Stellako rivers. These three waters are all also accessible by float plane. There is some rare use of Chedakuz Creek reported, from Tatelkuz Lake to the bridge over the creek. While there is semi-primitive non-motorized access to some parts of Davidson Creek, and some limited access to the lower reaches by roads (that should not be publically accessible per the Vanderhoof RLMP Access Management Plan (Section 1.3.2.1), no Aboriginal Groups or other stakeholders reported using Davidson Creek or its tributaries for navigational purposes. Several stakeholders responded that Davidson Creek is not considered to be suitable for any navigational use, and access to the area historically and recently has been for hiking, horseback riding, hunting, trapping, or other traditional land use, and not navigation.

3. Results

ERM

3. Results

3.1 ASSESSMENT OF NAVIGABILITY BASED ON JURISPRUDENCE CRITERIA

The assessment of navigability of for waters affected by Project works that were identified for further assessment in Appendix D (per methods in Sections 1.2 and 2), is divided into:

- an assessment based on strictly ***physical*** criteria; and
- an assessment on criteria pertaining to the ***public utility*** of the water as an aqueous highway.

In addition to being informed by case law precedent as outlined in Sections 1.2.2 and 2.5, the above approach mirrors sections 5(4)(a) and (c) of the NPA factors that will be used by the Minister, as provided in Notice of Works, regarding the physical characteristics of the water and the current or anticipated navigation in the navigable water. Table 3.1-1 provides a summary analysis of the key criteria from case law precedent applied to determine which identified waters (non-minor under the previous MWWO, as well as some minor waters affected by the TSF footprint) are considered navigable or not using physical and public utility criteria (Section 2.5). Physical criteria considered primarily focus on capacity to support navigation characteristics including floatability, obstructions to passage, and temporal considerations.

The public utility of non-minor waters was investigated primarily for the waters that are affected by components or activities on the Project site that will block access or change water flow, including for Davidson Creek (and its tributaries), Tatelkuz Lake which will be the source of water for the freshwater supply system for the Project, and Chedakuz Creek which both Tatelkuz Lake and Davidson Creek flow into. Some other waters affected by transmission line crossings, FSR bridge upgrades and the freshwater supply system upgrades have also been investigated.

First Nations and other commercial (i.e., guide outfitter and tourism operators) and recreational stakeholders were consulted regarding their past, present and intended use of lands and waters in and around the Project footprint for various uses, including hunting, trapping, fishing and navigational use. Statements made during consultation applicable to navigational use, access, flow and value of land are summarized in Table 3.1-2 and are described below. A more in depth analysis of the physical parameters and public (recreational, commercial and Aboriginal) use and value of the affected waters is also provided in the following sections per information requirements for a potential application for a GIC Proclamation of Exemption under s.24 of the NPA if TC deems that affected waters are navigable.

For waters directly affected by Project works on the mine site, eight reaches have been deemed to be non-minor in Appendix D. Along the whole of Davidson Creek, twelve reaches were found to be non-minor, including: two reaches (12 and 13) upstream of the TSF where fish habitat compensation and water flow alterations are proposed; one reach (9) which is under the TSF dam/embankment footprint; four reaches (8, 7.1, 7 and 6) downstream of the TSF dam where ancillary dams and the freshwater reservoir are proposed; and, five downstream reaches (1 to 5) which do not have proposed works that will directly affect them, but are included in the analysis in case there are flow effects and if TC deems s.(24) of the NPA applies to the Project. Two reaches (10 and 11) of Davidson Creek that were found to be minor in Appendix D under the previous MWWO have also been scoped into this assessment as these are affected by the TSF, and potential applicability of s.22 of the NPA. Three non-minor reaches were identified in Appendix D for Creek 704454 (reaches 1 to 3) at the Site D TSF location; and Chedakuz Creek (reach 15) was also found to be non-minor.

An analysis of the jurisprudence physical navigability criteria of how well the above identified reaches support being able to float a vessel (such as a kayak or canoe)—including whether they are predominantly characterized by clear passage *versus* obstruction—is provided in Table 3.1-1. The analysis is based upon field data collated in Appendix D, (i.e., Tables 3.1-1 and 3.1-13); this includes an aerial tour of Davidson Creek for reaches of this stream that had challenging ground access (Appendix C, Figure 1) and reaches previously deemed NVC in earlier studies (Appendix A). Photos to support the assessment are in Appendix B.

In addition to waters affected at or downstream of the mine site (including for fish habitat compensation), waters found to be non-minor for off-site linear components on waters that are not listed under the NPA Schedule have also been scoped into the assessment of navigability based on jurisprudence since New Gold has decided to potentially opt in to the NPA approval process for works proposed on waters deemed navigable in this assessment.

3.1.1 Davidson Creek

The following reaches of Davidson Creek found to be non-minor waters under the MWWO (2009) screening in Appendix D have been assessed for navigability, as summarized in Table 3.1-1: five reaches (6, 7, 7.1, 8 and 9) that will be directly affected by works in the mine site footprint, five reaches (1, 2, 3, 4, and 5) downstream of mine site works, and two upper reaches (12 and 13) that will be affected by proposed fish habitat compensation plans. Reach 6 is also crossed by the MAR crossing, AP-004 (Appendix D, Figure 3.1-2), so the assessment for reach 6 is also considered to apply to this bridge crossing.

All of the reaches assessed using common law criteria for navigability are non-minor except for two reaches of Davidson Creek found to be minor waters (10 and 11). Since these two reaches are located in very close proximity to other minor tributaries within the mine site, these reaches are used as proxies for the other minor waters in the mine site to reduce redundancy in the assessment since their public use characteristics are analogous.

3.1.1.1 Physical Capability to Support Navigation

Reaches 4 (Appendix C: Plate 11), 7 (Appendix C: Plate 8) and 8 (Appendix C: Plate 6) along Davidson Creek are ranked as having Medium capacity to support navigation in Table 3.1-1 due to their small size (5 to 7 m wide), shallow average depth (0.42 to 0.71 m), and presence of obstructions (typically consisting of fallen log jams). Though these reaches have blockages, field observations record these as few (one to two), so these reaches are not considered obstructed. Given their observed characteristics, reaches 4, 7 and 8 of Davidson Creek may be able to support passage of a canoe or kayak, and so are conservatively considered ***physically navigable***.

Reaches 1, 3, 7.1 and 12 of Davidson Creek are rated as having a Low physical capacity to support navigation in Table 3.1-1. This is due to their small widths, shallow depths and/or higher frequency of obstruction. Reaches 1 (Appendix C: Plate 15), 3 (Appendix C: Plate 12) of Davidson Creek have four or more blockages to passage. Due to their Low capacity to support navigation, and being characterized predominantly by obstruction, these three reaches are ***not considered physically navigable***. Reach 7.1 (Appendix C: Plate 7) does not have three or more observed obstacles; however, this reach has a low depth, shallow riffles, high presence of boulders, and steeper slopes (>4%) so this reach is considered to have low capacity to support reasonable navigation and is therefore ***not considered to be physically navigable***. Similarly, Reach 12 (Appendix C: Plate 2) is not characterized by three or more distinctive obstructions; however, it is very narrow (3.42 m average bankfull width) and has prolonged stretches that are shallow, very rocky and clearly not navigable (Appendix C: Plate 2); this reach has been ranked as Low capacity to support navigation and is ***not considered physically navigable overall***.

Table 3.1-1. Navigability Assessment of Waters Affected by the Project Based on Jurisprudence Criteria

Water			PHYSICAL ASSESSMENT								PUBLIC UTILITY ASSESSMENT					RESULT
Identifiers			Waterway Characteristics						Physical Criteria		Public Use	Access		Connectivity		
No.	Water	Location	Plate No.[1]	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Obstructions to Passage Observed on Ground (#)	Characterization of Navigability	How Floatable is the Section?	Characterized by Obstruction? (≥ 3 blockage)	Past, Present or Reasonable Future Navigation (Reported or Other)?	Public Access to Both Ends of Water?	Access Restriction Under VLRMP?	Is the Water Part of Larger Navigational Network?	Is Water More than Small Isolated Body?	Is the Water Navigable by Common Law Criteria?
Waters Directly Affected by Mine-Site Works																
7	Davidson Creek (reach 6)	Partially under freshwater reservoir	11,12	5.19	0.5	0.6	15	Shallow channel with fallen logs	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
8	Davidson Creek (reach 7)	Under freshwater reservoir	13,14	5.08	0.45	2.1	1	Shallow channel with log jam	Medium	N	N	N	Semi-primitive non-motorized	N	Y	N
9	Davidson Creek (reach 7.1)	Under freshwater reservoir	15,16	6.44	0.54	2.1	2	Shallow riffles; steep (>4%) sections; large boulders; fallen tree	Low	N	N	N	Semi-primitive non-motorized	N	Y	N
10	Davidson Creek (reach 8)	Under ECD	17,18	6.9	0.65	1.9	1	Shallow channel with log jam	Medium	N	N	N	Semi-primitive non-motorized	N	Y	N
11	Davidson Creek (reach 9)	Under TSF, Control dam and downstream of TSF	19,20	5.19	0.42	1.8	1	Shallow channel with log jam	Medium	N	N	N	Semi-primitive non-motorized	N	Y	N
15	Creek 704454 (reach 1)	Under TSF	23,24	3.62	0.49	2.4	5	Shallow channel with steep cascade section	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
16	Creek 704454 (reach 2)	Under TSF	25,26	3.02	0.56	3	10	Shallow channel with 5 steep cascade sections	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
17	Creek 704454 (reach 3)	Under TSF	27,28	3.43	0.55	2.6	4	Shallow channel with fallen logs and 3 steep cascade sections	Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
12	Davidson Creek (reach 10; *Minor Water*)	Under TSF	4	2.74	0.51	0.8	ns	Most sections are shallow (<.5 m); cobble/boulder substrate common; hard to access to sample due to log jams	Very Low	Y**	N	N	Not restricted	N	Y	N
13	Davidson Creek (reach 11; *Minor Water*)	Under TSF	3	2.04	0.41	1.8	ns	Most sections are shallow (<.5 m); three sections with steep boulder cascades; hard to access to sample due to log jams	Very Low	Y**	N	N	Not restricted	N	Y	N
Reaches Downstream of the Mine Site Subject to Hydrological Changes																
12	Chedakuz Creek (reach 15)	Downstream of Tatelkuz Lake and Mine Site	-	27.1	ns	<1	0	Large creek with no blockages in reach 15.	High	N	Y	Y	Semi-primitive non-motorized	Y	Y	Y
2	Davidson Creek (reach 1)	Downstream of mine site	5	6.41	0.72	0.4	5	Log jam and LWD (4)	Low	Y	N	Y	Semi-primitive non-motorized	N	Y	N

(continued)

Table 3.1-1. Navigability Assessment of Waters Affected by the Project Based on Jurisprudence Criteria (continued)

Water			PHYSICAL ASSESSMENT								PUBLIC UTILITY ASSESSMENT					RESULT
Identifiers			Waterway Characteristics						Physical Criteria		Public Use	Access		Connectivity		
No.	Water	Location	Plate No.[1]	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Obstructions to Passage Observed on Ground (#)	Characterization of Navigability	How Floatable is the Section?	Characterized by Obstruction? (≥ 3 blockage)	Past, Present or Reasonable Future Navigation (Reported or Other)?	Public Access to Both Ends of Water?	Access Restriction Under VLRMP?	Is the Water Part of Larger Navigational Network?	Is Water More than Small Isolated Body?	Is the Water Navigable by Common Law Criteria?
3	Davidson Creek (reach 2)	Downstream of mine site	6	6.44	0.62	0.5	10	Shallow riffle section, log jams (6), and LWD (4)	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
4	Davidson Creek (reach 3)	Downstream of mine site	7	6.03	1	0.3	4	Shallow riffle sections and LWD (4)	Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
5	Davidson Creek (reach 4)	Downstream of mine site	8	6.92	0.71	1	2	2 log jams	Medium	N	N	N	Semi-primitive non-motorized	N	Y	N
6	Davidson Creek (reach 5)	Downstream of mine site	9,10	5.66	0.53	0.4	4	4 log jams	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
Waters Affected by Fish Habitat Compensation																
14	Davidson Creek and pools (reach 12)[3]	Upstream of TSF; stream flooded as part of Fish Habitat Compensation	21,22	3.42	0.48	0.5	2	Most sections are < 3m wide; sections with large boulders; blockages include a beaver dam and braided channel 1.8 m	Low	N	N	N	Semi-primitive non-motorized	N	N[6]	N
-	Lake 01682LNRS (reach 13)[3]	Upstream of TSF; diversion channel; flow will be altered as part of Fish Habitat Compensation	-	9*	ns	ns	0	Small upper reaches lakes; 2 pools <200 m in length and <0.5 m deep	High	N	N	N	Semi-primitive non-motorized	N	N	N
-	Lake 01538EUET (Creek 705)	Diversion channel; flow will be altered as part of Fish Habitat Compensation	-	35.2*	ns	ns	0	Small upper reaches lakes; 2 pools <200 m in length and <0.5 m deep	High	N	N	N	Semi-primitive non-motorized	N	N	N
Waters for Off-Site Linear Works																
TL-1065	Nechako River	Transmission Line Crossing	30	90	ns	ns	ns	Large river with no blockages in 200m reach centered on crossing site.	Very High	N	Y	Y	Not restricted	Y	Y	Y
TL-937	Stellako River	Transmission Line Crossing	22	25	ns	ns	ns	Large river with no blockages in 200m reach centered on crossing site.	Very High	N	Y	Y	Not restricted	Y	Y	Y
SR-003	Stellako River	Stellako Trans. Line Re-route	33	21	ns	ns	ns	Large river with no blockages in 200m reach centered on crossing site.	Very High	N	Y	Y	Not restricted	Y	Y	Y
AP-004	Davidson Creek (See also Reach 6)	Mine Access Road Bridge Crossing	34	6.5	0.46	1.5	3	Abundant blowdown across banks that would extremely impede navigation.	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N

(continued)

Table 3.1-1. Navigability Assessment of Waters Affected by the Project Based on Jurisprudence Criteria (completed)

Water			PHYSICAL ASSESSMENT								PUBLIC UTILITY ASSESSMENT					RESULT
Identifiers			Waterway Characteristics						Physical Criteria		Public Use	Access		Connectivity		
No.	Water	Location	Plate No.[1]	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Obstructions to Passage Observed on Ground (#)	Characterization of Navigability	How Floatable is the Section?	Characterized by Obstruction? (≥ 3 blockage)	Past, Present or Reasonable Future Navigation (Reported or Other)?	Public Access to Both Ends of Water?	Access Restriction Under VLRMP?	Is the Water Part of Larger Navigational Network?	Is Water More than Small Isolated Body?	Is the Water Navigable by Common Law Criteria?
AP-007	Turtle Creek	Mine Access Road Bridge Crossing	35	3.2	0.76	1.5	0	No evidence of past use. Some shallow bars but potentially navigable with small craft. 0.6m clearance at bridge.	Medium	N	N	Y	Semi-primitive non-motorized	Y	Y	Y
FSS-003	Unnamed Ck.	Freshwater pipeline bridge upgrade	38	4.47	1	1.4	4	2 beaver dams and 2 LWD blowdowns across creek	Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
FSS-008	Unnamed Ck.	Freshwater pipeline bridge upgrade	36	3.98	0.72	4.2	29	Fallen LWD every 5-10 m, numerous SWD jams and 2 large trees down	Very Low	Y	N	N	Semi-primitive non-motorized	N	Y	N
FSS-000	Tatelkuz Lake	Freshwater supply intake and effects on water levels	-	9274	ns	ns	ns	Large lake that is navigable.	Very High	N	Y	Y	Semi-primitive Motorized	Y	Y	Y

Notes:
Darker shades of green indicate increased navigability while darker shades of gray indicate decreased navigability.
D/S - downstream; m - metre; Mean BfD - mean bankfull depth; Mean BfW - mean bankfull width; No. - number; ns - not sampled; % - percent.
Trib - tributary; TSF - tailings storage facility; U/S - upstream; UTM - Universal Transverse Mercator; LWD - large woody debris; SWD - small woody debris; VLRMP - Vanderhoof Land and Resource Management Plan.
**GIS estimate of lake surface area.*
[1] Photo numbers refer to photo plates in Appendix C; dash indicates no photo.
[2] Numbers correspond to Table 3.1-1.
[3] Numbers correspond to Table 3.1-3.
[4] Lake area in m^2
[5] Due to the difficulty to access this reach via land, this measurement is not considered representative, as illustrated in Figure 1 (Appendix C), which shows the considerable amount of blowdown along this reach.
[6] Note that only the two upper reaches of Davidson Creek have been characterized as small isolated bodies of water since they are cut off from the rest of Davidson Creek by the reaches previously deemed as minor reaches, and have no access roads to them.

Table 3.1-2. Summary of Consultation Statements and Issues Raised Relevant to Navigation in the Blackwater Project Area

#	Water	User/Stakeholder	Summary of Statements and Issues Raised	Relevant to Navigation	Relevant to Access	Relevant to Value[1]	Relevant to Flow	Not Project Specific	Source
1	Davidson Creek	Tatelkuz Lake Ranch Resort	*Davidson Ck. is too small for anything but otters and fish. No boats, canoes/kayaks are used in this creek.* **Inferred that Davidson Ck. is not considered navigable by respondent.**	X					ROC#2,2315, Phone Call July 9, 2013
2	Davidson Creek	Elsie Jimmie, Lhoosk'uz Dene Nation (LDN)	*Davidson Ck. not big enough* [for boating]. *There is fish spawning there. Kokanee mostly spawn there but the suckers spawn on another creek, the one on Davidson Ck. is where kokanee spawn. Used to go to Davidson by saddle horse. No road before but now there is a road to Davidson Ck.* **Inferred that Davidson Ck. is not considered navigable by respondent.**	X	X				Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
3	Davidson Creek	BW Individual 2	*Has used Davidson Ck. for hunting and fishing. Gets to fishing areas using a vehicle, uses the areas mostly in summer and fall, though also sometimes in the spring when there is high water. He camps when he stays overnight.* **Respondent accesses some part of Davidson Ck. seasonally by vehicle.**		X				ROC#1,579, Appendix 3, 2013 Baseline Report- Navigable Waters
4	Davidson Creek	Roger Jimmie, LDN	*Several trails lead up the south face of Mount Davidson and cross over heading to the north. No specific location and or landmarks were mentioned. His people went up Mount Davidson to collect "Indian tobacco". The exact plant was not identified. Mentioned a cabin (and/or trapline) in proximity to Davidson Ck. at its lower elevations on the mountain.* **Discusses access outside of Project area.**		X				ROC#113 [Also #116], Site Visit March 3, 2011
5	Davidson Creek	Nechako Valley Sporting Association	*Asked specifically about kokanee in Davidson Ck. Wasn't sure where Davidson Ck. was. No one had knowledge of any fishing activity in this creek.* **Davidson Ck. is not accessed nor navigated by respondent.**		X				ROC#1,350, Meeting February 20, 2013
6	Davidson Creek	Batnuni Lake Guides & Outfitters Ltd.	*Frustrated with the Government and with L&M* [Lumber] *over the amount of public access into this territory. L&M has a gate up near lower Davidson Ck. but it's not locked and consequently, area hunters are frequently into the territory. At one time, the only access allowed was by horseback or on foot but now hunters are coming in on quads or in trucks.* **Davidson Ck. area has public access (may break VLRMP AMP).**		X	X			ROC#753, Phone Call October 25, 2012
7	Davidson Creek	Moose Lake Lodge and Fawnie Mountain Outfitters	*Was interested in the potential impacts of our project on the Davidson, Tatelkuz Lake and to fish and fish habitat. Confirmed our understanding that no one fishes at the headwaters of the Davidson as the area is not easily accessible, the fish are small and there are areas with a much more abundant source of kokanee and rainbow trout.* **Davidson Ck. Upper reaches not easily accessible with no reason to access.**		X	X			ROC#747, Meeting October 23, 2012
8	Davidson Creek	Batnuni Lake Guides & Outfitters Ltd.	*They bought the tenure for the horseback hunting opportunities in the lower Davidson area, down to the south end of Tatelkuz Lake. This area is designated for non-motorized recreational use. Logging and access issues have conspired against them. Of particular concern is a gate just off of the Kluskus FSR near km 126. The gate used to have lock blocks across it during the hunting season (Sept 1-Oct 31), which was far more effective at keeping motorized hunters out. Now there is a gate that is not locked. Many hunters disobey the non-motorized recreational use designation and as a result he is unable to effectively use the area to bring in clients anymore. They have no improvements to the land. No trails of note, or cabins.* **Davidson Ck. area has public access; wants to maintain VLRMP AMP.**		X	X			ROC#916, Meeting November 26, 2012
9	Davidson Creek	Emily Cupples, LDN	*The* [Project] *site- Everybody from Ulkatcho goes and has gatherings near the site. My grandmother used to ride horses to where the site is. There is a wagon trail.* **References historical First Nation access near the Project site via horse, though not for navigation.**		X	X			Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
10	Davidson Creek	Neil Guthreau, Natural Resources Manager, LDN	[Tatelkuz Lake has] *been consistent. This spring the water was very high. There is a lot of spring water in the area. We made a floating bridge but the water was so high the bridge floated. The bridge was right by the house on Davidson Ck. Lots of spring run offs. Barry Mills changed the name to Barry Lake but it used to have a Carrier name. The water was very high this spring and it created problems for access. We had to park and walk across the water in gumboots.* **Tatelkuz Lake has high spring flow; access issues to the lake; infers Tatelkuz Lake is navigable.**		X		X		Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
11	Tatelkuz Lake	Tatelkuz Lake Ranch Resort	*Has canoes/kayaks available for use by those renting cabins and they have also have a boat. Use of the boat is restricted to Tatelkuz Lake, the canoes and kayaks are used in the lake.* **Speaks to established boating (navigation) on Tatelkuz Lake, though not elsewhere in area.**	X	X				ROC#2,2315, Phone Call July 9, 2013
12	Tatelkuz Lake	Elsie Jimmie, LDN	*I live at Tatelkuz Lake. Elsie confirms she is the only family living there with Rudy, Darcy, Elsie and Rosa. Their grandson did live there. I lived there since 1957 when I got married. They don't usually see a lot of recreationalists, just people from the* [Tatelkuz Lake*] Ranch. We do canoe on Tatelkuz right to the other end. We used to own horses and ride throughout the entire area. Hunting and gathering occurs throughout the whole area. It's not one site specific, it is everywhere.* **Speaks to past/current First Nation and recreational navigational use of Tatelkuz Lake.**	X	X				Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013

(continued)

Table 3.1-2. Summary of Consultation Statements and Issues Raised Relevant to Navigation in the Blackwater Project Area (continued)

#	Water	User/Stakeholder	Summary of Statements and Issues Raised	Relevant to Navigation	Relevant to Access	Relevant to Value	Relevant to Flow	Not Project Specific	Source
13	Tatelkuz Lake	Elsie Jimmie, LDN	*Tatelkuz has lots of trout and kokanee. There are suckers in Tatelkuz and everywhere. We eat* [fish] *a lot, 3-4 meals per week... Right now it's difficult because we don't have a boat motor. Access to other places is hard. Can't pack your canoe on a horse and fish in the other locations. Only time we fish is springtime… There are muskrats, beaver and ducks in the spring and fall. These are trapped or shot. They are in water all the time. Used to trap but they are retired from this now. Whenever you feel like it or need* [plants]. *Just do it around the lake and near towards the river to the east of Tatelkuz.* **Speaks to traditional use of Tatelkuz Lake for fishing and access to lake area for subsistence hunting and gathering; navigation for spring fishing assumed.**	X	X	X			Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
14	Tatelkuz Lake	Emily Cupples, LDN	*The area to the east of Tatelkuz is where we used to burn our family members. We never buried them. In the 1800's. My grandmother told me. It is a special spot, a sacred place. We were told to go there and pray because that's where our ancestors are buried. That's why we are called carrier. We burned our relatives and carried the ashes for a year. The only way to get there is by hiking or horseback. Emily says she canoes on Tatelkuz, many Kluskus people and Saik'uz people would go to Tatelkuz Lake to canoe but not so much anymore.* **Speaks to access to area around Tatelkuz Lake for traditional cultural purposes, and historic and some current navigational use of Tatelkuz Lake.**	X	X	X			Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
15	Tatelkuz Lake	Nechako Lodge and Aviation	*All the bigger lakes and rivers are used for float planes …Tatelkuz Lake…* **Speaks to Tatelkuz Lake being accessible via float plane.**	X	X				ROC#1,578, Appendix 3, 2013 Baseline Report- Navigable Waters
16	Tatelkuz Lake	BW Individual 3	*I live on the Nechako River but [it] would take 2 plus hours to drive to Tatelkuz Lake.* **Speaks to knowledge of driving to access Tatelkuz Lake.**		X				ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
17	Tatelkuz Lake	BW Individual 4	*Float plane use on: …Tatelkuz Lake…* **Speaks to float plane access to Tatelkuz Lake.**	X	X				ROC#1,588, Appendix 3, 2013 Baseline Report- Navigable Waters
18	Tatelkuz Lake	BW Individual	*Asked if Davidson Ck. flowed into Tatelkuz Lake, since they have kokanee in that area.* **Expression of interest in fishing Tatelkuz Lake.**		X				ROC#1,850, Open House at Burns Lake, May 8, 2013
19	Tatelkuz Lake	Roger Jimmie (Lhoosk'uz Dene Nation (LDN)	*Also mentioned other trails in the area, including one from Kuyakuz Lake north to Tatelkuz Lake and further on - which is well known.* **Speaks to access by foot trail to Tatelkuz Lake.**	X					ROC#113, Site Visit with LDN November 3, 2011
20	Tatelkuz Lake	William Cassam, Holder of Trapline TR0512T027	*Tatelkuz Lake and the streams and lakes in the upper reaches of Davidson Ck. Indicated that these areas of the trapline, as well as the areas further to the west of the Project, were not historically used. Trapping and associated activities were focused on the shores of Kuyakuz Lake.* **Specifies Tatlekuz Lake and upper reaches of Davidson Creek not historically used for trapping activity - this occurred elsewhere outside of the Project area.**	X					ROC#2,402, Meeting July 31, 2013
21	Tatelkuz Lake	Batnuni Lake Guides & Outfitters Ltd.	*At one time, they had a cabin on the south end of Tatelkuz Lake but it has burned down and they do not have any infrastructure on the territory registered under his name.* **Indicates historic access and habitation along Tatelkuz Lake.**	X					ROC#753, Phone Call October 25, 2012
22	Tatelkuz Lake	Roger Jimmie, Holder of Trapline TR0512T014	*Recalled fishing for trout in Kuyakuz Lake, Chedakuz Ck. between Kuyakuz and Tatelkuz Lakes, Tatelkuz Lake as well as in Chedakuz Ck. downstream of Tatelkuz Lake.* **Speaks to historic access for fishing in Tatelkuz Lake and Chedakuz Creek (not necessarily navigation).**	X					ROC#1,822, Meeting May 1, 2013
23	Tatelkuz Lake	BW Individual	*During dry years the water recedes between 10-15 feet* [at Lake Tatelkuz]; *water depth towards the northwest end of the lake is very shallow and you can walk for about 100 feet with the water no higher than your knee.* **Speaks to Tatelkuz Lake levels.**				X		ROC#1,858, Open House May 6, 2013
24	Tatelkuz Lake	Pierre, Ulkatcho First Nation	*His wife has a house at the end of Tatelkuz Lake.* **Speaks to access and residency on Tatelkuz Lake.**	X					ROC#676, Site visit July 24, 2012
25	Tatelkuz Lake	Moose Lake Lodge and Fawnie Mountain Outfitters	*Was interested in the potential impacts of our project on the Davidson, Tatelkuz Lake and to fish and fish habitat.* **Speaks to an interest in use of Davidson and Tatelkuz Lake for fishing.**			X			ROC#747, Meeting October 23, 2012

(continued)

Table 3.1-2. Summary of Consultation Statements and Issues Raised Relevant to Navigation in the Blackwater Project Area (continued)

#	Water	User/Stakeholder	Summary of Statements and Issues Raised	Relevant to Navigation	Relevant to Access	Relevant to Value	Relevant to Flow	Not Project Specific	Source
26	Tatelkuz Lake	Sandra Brough, Holder of Trapline TR0601T003	*Is definitely in favour of the* [transmission] *line following the Kluskus Forest Road. There are no concerns with following the existing forest road, however she would have big problems with the other route as it passes just about on top of her cabin which is a Residential Lease - Lot 3127. The route going north behind Doug Short's property would open up access to her trapline, range and private dwelling. As she lives in town now, there are long periods when no one is at the cabin so she doesn't want there to be easy access.* **Speaks to desire to maintain low access (near Tatelkuz Lake).**		X	X			ROC#1,766, Meeting April 17, 2013
27	Tatelkuz Lake	Lhoosk'uz Dene Nation (LDN)	*Confirmed that the known sacred sites are on the shores of Kuyakuz Lake, along the Messue wagon road, in Kuyakuz Lake in general, the area between Kuyakuz and Tatelkuz Lakes, as well as a site south of our proposed work program in Auro, along the Blackwater River.* **Speaks to access to Tatelkuz Lake and sites outside Project area.**		X	X			ROC#1,821, Meeting May 1, 2013
28	Tatelkuz Lake	BW Individual	*Tatelkuz Lake has been used for recreational purposes. There are lots of good places for recreational fishing in the project area.* **Speaks of recreational use of Tatelkuz lake, specifically for fishing.**		X				ROC#1,859, Open House in Fraser Lake May 7, 2013
29	Tatelkuz Lake	Rosa McIntosh, SFN	*Rosa has lived at Tatelkuz Lake for one year. They are off the grid meaning there is no power, no running water, no road access, it's all mud roads. They call it marshy roads. The road has not been maintained by the band because they live so far. [In the winter] its bad because there is no plough. The road is not wide enough for the sand truck to go through or the snowplough. There are no existing houses out there although there are dwellings (old houses out there) but no one goes out there.* **Speaks to limited motorized access to Tatelkuz Lake.**		X				Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
30	Chedakuz Creek	Tatelkuz Lake Ranch Resort	*As well some folks canoe/kayak down Chedakuz Ck. from the Lake to the Bridge.* **Speaks to some navigation along Chedakuz Creek.**	X	X				ROC#2,2315, Phone Call July 9, 2013
31	Chedakuz Creek	Sandra Brough, Holder of Trapline TR0601T003	*She has a cabin within her trapline territory (south of Chedakuz Ck.) and does some trapping as this is required to maintain her license although she says with fur values so low, she doesn't rely on this for income. She also has a range lease in that same area. She currently lives in Fort Fraser area with her daughters when she isn't in camp. Accesses her cabin via Doug Short's driveway and is the holder of the key to his gate. Has crappy access and wants it to stay that way to discourage anyone from going into her place when she isn't around. One of her concerns relates to increased access. The proposed power line and new access road is a long way from her cabin and she didn't see any problems with this.* **Speaks to limited motorized access to Tatelkuz Lake, and intent to keep it this way.**		X	X			ROC#930, Meeting November 30, 2012
32	Chedakuz Creek	BW Individual	*During dry years, the inflow of Chedakuz Ck. into the lake dries up.* **Speaks to a reach of Chedakuz not affected by the Project and seasonally limited navigability.**				X		ROC# 1,858, Open House May 6, 2013
33	Chedakuz Creek	Lyle Barsby, Batnuni Lake Guides & Outfitters	*Did not express any specific concerns with New Gold's exploration plans for this year but wants to make sure that they stay away from his corrals etc. near Chedakuz Ck.* **Speaks to interest to limit access in the vicinity of Chedakuz Ck.**		X	X			ROC#1,964, Phone call May 22, 2013
34	Chedakuz Creek	Emily Cupples, LDN	*The trout is good* [at Chedakuz]. *We use both sides and it goes all the way to Kuyakuz Lake, we use horseback to get there. If the road was fixed we could drive. There is a lot of windfall and we tried to get a project to fix the road up. We told Darcy to phone the band to open the Wagon Trail from Tatelkuz to Kluskus but didn't happen. Kluskus cannot be accessed directly you need to go a very long ways around even though its 22km. We want it fixed, it would be good. But there is so much windfall we can't get between the two places. Now it takes 8 hours.* **Speaks to access challenges to FN traditional use of the trail to reach Chedakuz Ck. due to blowdown.**		X	X			Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
35	Chedakuz Creek	Elsie Jimmie, LDN	*Suckers spawn near Chedakuz* [Ck.]. **Speaks to fishing interests in Chedakuz Ck., not explicitly to navigation.**					X	Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
36	Other	BW Individual 2	*He used the Nechako River for canoeing.* **Speaks to use of Nechako River for navigational use with canoe.**	X					ROC#1,579, Appendix 3, 2013 Baseline Report- Navigable Waters
37	Other	Elsie Jimmie, LDN	*They do not really use Snake Lake.* **Speaks to limited access and use of Snake Lake, which is not affected by the Project.**	X		X			Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013

(continued)

Table 3.1-2. Summary of Consultation Statements and Issues Raised Relevant to Navigation in the Blackwater Project Area (continued)

#	Water	User/Stakeholder	Summary of Statements and Issues Raised	Relevant to Navigation	Relevant to Access	Relevant to Value	Relevant to Flow	Not Project Specific	Source
38	Other	Elsie Jimmie, LDN	*Top Lake is an area they go. It has an old cabin there. There is another one coming in from 104 km at Kluskus FSR. There is a little creek there before the gravel pit that has good fishing. She used to fish there. Darcy rode his horse up there too. The Twin Lakes are good, easy fishing, Use pins to fish up there.* **Speaks to access to lakes in greater regional area, but not affected by Project.**		X			X	Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
39	Other	Elsie Jimmie, LDN	*We hike, lots of people hike on the grease trails, right along the Messue Wagon trails. Lots of people hike there. Sometimes we run into Germans a lot.* **Speaks to foot (hiking) access to greater regional area, not navigation.**		X			X	Meeting with LDN (Jimmie Family) and Rosa McIntosh from Saikuz First Nation, July 4, 2013
40	Other	Nechako Lodge and Aviation	*All the bigger lakes and rivers are used for float planes (for example Nechako River, Tatuk Lake, Finger Lake…Stellako River)…* **Speaks to float plane access of Nechako River and Stellako River.**		X				ROC#1,578, Appendix 3, 2013 Baseline Report- Navigable Waters
41	Other	Nechako Lodge and Aviation	*The Nechako Reservoir, in Knewstubb Lake. I am worried because it is located downstream of the proposed mine and it is the biggest water reservoir in the area. A lot of boating activity in the lake which is the access route to Entiako Park.* **Speaks to Nechako Reservoir, which is outside Project area, and will not have navigational characteristics affected by Project.**	X	X	X		X	ROC#1,578, Appendix 3, 2013 Baseline Report- Navigable Waters
42	Other	Nechako Lodge and Aviation	*Tetachuk Lake, Fawnie Ck., Top Lake, all these are downstream [of] the proposed mine and they drain into the* [Nechako] *reservoir.* **Speaks to downstream drainage, which is outside of the Project area and sphere of navigational influence.**					X	ROC#1,578, Appendix 3, 2013 Baseline Report- Navigable Waters
43	Other	BW Individual 2	*Also fishes in Tatuk Lake and Finger Lake with a canoe, and the Nechako Reservoir (Knewstubb Lake).* **Speaks to navigational use outside of the Project area and sphere of navigational influence.**	X				X	ROC#1,579, Appendix 3, 2013 Baseline Report- Navigable Waters
44	Other	BW Individual 3	*Most individuals in this region would drive with pickup trucks to these areas and access is on the Kluskus FSR… on the west and down the Tatuk/Bobtail FSR on the east for Tatuk Lake.* **Speaks to access to waters outside of the Project area and sphere of navigational influence.**		X			X	ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
45	Other	BW Individual 3	*There is many miles and many lakes between the Stellako River* [access by paved road and highways] *and the Nechako River* [paved Highway] *and Top Lake* [which is so far from this mine site that it would have little interest within the region].**Speaks to access of Nechako and Stellako Rivers, and access outside Project sphere of navigational influence.**		X				ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
46	Other	BW Individual 3	*Although ice fishing can be popular these lake would receive limited winter fishing pressure while summer fishing and access and usage starts around May until the end of Sept in a general sense.* **Speaks to seasonal lake use in the Project area.**		X				ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
47	Other	BW Individual 3	*Answered "yes" to the following questions: 1) Do you fish, hunt, pick (i.e. berries) etc. in the area? 2) Are you aware of other people staying in the area?* **Indicates access of respondent and others to Project region.**		X			X	ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
48	Other	BW Individual 3	*All of these areas are important for what they provide. Hunting, fishing, camping, etc., but this project would have little influence on my ability to use of enjoy [them].* **Speaks to low effect the Project would have on lands and waters in Project region.**			X		X	ROC#1,585, Appendix 3, 2013 Baseline Report- Navigable Waters
49	Other	BW Individual 4	*Float plane use on: Finger, Tatuk…Tsacha and Top Lakes.* **Speaks to access to lakes outside of the Project area and sphere of navigational influence.**		X			X	ROC#1,588, Appendix 3, 2013 Baseline Report- Navigable Waters

(continued)

Table 3.1-2. Summary of Consultation Statements and Issues Raised Relevant to Navigation in the Blackwater Project Area (completed)

#	Water	User/Stakeholder	Summary of Statements and Issues Raised	Relevant to Navigation	Relevant to Access	Relevant to Value	Relevant to Flow	Not Project Specific	Source
50	Other	BW Individual 4	*Frequent use of Euchiniko River, and occasional on the West R*[oa]*d River. Typical usage a couple of weeks a summer. Site access via truck, canoe or float plane. Encounters other people in the area by float plane, helicopter and canoe. Usually fishes from the plane, and always from the canoe. Has a regular campsite on Euchiniko and West Rd River.* **Speaks to access to and navigational use of lakes outside of the Project area and sphere of navigational influence.**	X	X			X	ROC#1,588, Appendix 3, 2013 Baseline Report- Navigable Waters
51	Other	BW Individual 4	*I have also ice fished on the Euchiniko River.* **Speaks to access to lakes outside of the Project area and sphere of navigational influence.**		X			X	ROC#1,588, Appendix 3, 2013 Baseline Report- Navigable Waters
52	Other	BW Individual 4	*Those waterways without road access are important. There are very few now, and they have unique recreational value in their isolation.* **Speaks to value and intent to maintain semi-primitive non-motorized access to waters in Project region in general, though not to navigation (typically cannot bring in a vessel without motorized access to these areas).**	X	X	X		X	ROC#1,588, Appendix 3, 2013 Baseline Report- Navigable Waters
53	Other	William Cassam, Holder of Trapline TR0512T027	*Recalls learning to trap and working the trapline with his father, but hasn't been out on it for >20 years. They used the trapline seasonally, spending summers hunting down at Blue Lake (on the south side of the Blackwater River, west of Kluskus Village, also within their keyoh), and then moving into the trapline area in October to trap for the winter. They used to cross the Blackwater River at the Messue crossing, and then used the Messue wagon road to access the portion of the trapline on the west side of Kuyakuz Lake. Their trapping activity on the trapline was focused down near the shores of Kuyakuz lake, as well as along one unnamed tributary to Kuyakuz Lake on the western side of the lake. While working the trapline, they did not hunt big game animals like moose or caribou. They ice-fished Kuyakuz Lake for trout, and ate meat from the animals that they trapped. They trapped beaver most notably, but also other furbearers. They specifically noted eating beaver. They collected plants/medicine while on the trapline.* **Speaks to traditional access and use of lands outside of the Project area.**		X			X	ROC#2,402, Meeting July 31, 2013
54	Other	Moose Lake Lodge and Fawnie Mountain Outfitters	*The majority of his hunts are in the Fawnie Ck. area…* **Speaks to access and use for hunting outside of the Project area.**					X	ROC#747, Meeting October 23, 2012

Note: text in italics is taken from the records of consultation, and bold text is the interpretation related to navigability; Ck.=Creek; LRMP=Vanderhoof Land and Resource Management Plan; AMP: Access Management Plan (Section 3.1.1.2; [1]Value refers to the value that the respondent has for the access or navigational use.

Reaches 2, 5 and 6 in Davidson Creek are rated as having Very Low capacity to support physical navigation in Table 3.1-1. Field observations found that Reach 2 (Appendix C, Plates 13 and 14) has 10 blockages to navigation, so this reach is considered markedly characterized by obstruction, and is not considered navigable as a result. Reach 5 (Appendix C, Plate 10) has four obstacles recorded from field observation, but the aerial shots of this hard to access reach indicate that it is marked by multiple obstructions caused by MPB blowdown (Appendix C, Figure 1); this reach is considered markedly characterized by obstruction and not reasonably navigable. Reach 6 (Appendix C, Plate 9) was also challenging to access in the field, where one obstruction to passage was recorded; however, the aerial view of this reach (Appendix C, Figure 1) reveals considerable blowdown along this stretch of Davidson Creek, indicating that it is obstructed, and not reasonably capable of supporting navigation.

The headwater Lake 01682LNRS, located in the upper reach of Davidson Creek (13), is approximately 9 ha in surface area, which would support passage of floating vessels such as canoes or kayaks with relative ease (Appendix C, Figure 1); this reach has been ranked as High for being able to support navigation in Table 3.1-1. Lake 01682LNRS also has zero obstacles to navigation observed in the field, so is characterized predominantly by clear passage. Therefore, Lake 01682LNRS is deemed ***physically navigable***.

Reaches 9 and 10 of Davidson Creek were classified as minor waters in the MWWO screening exercise. These two reaches of Davidson Creek are considered representative of the other 26 reaches for smaller creeks in the mine site area (that were also found to be minor in Tables 3.1-1 and 3.1-13) for the purposes of the common law navigability assessment. As summarized in Table 3.1-1, these two reaches are considered to have low capacity to physically support navigation (consistent with a minor water classification) due to their physical characteristics (i.e., obstruction which posed access challenges). Consequently, these two reaches of Davidson Creek are considered ***not physically navigable***.

One of the MAR bridge crossings deemed as non-minor in Appendix D Table 3.1-1 is over Davidson Creek (AP-004; Appendix C, Plate 34; Appendix D, Figure 3.1-2). The AP-004 crossing is over reach 6 of Davidson Creek, which has already been assessed as a reach that is ***not navigable*** in Section 3.1.1; this assessment also stands for the section crossed by this MAR bridge crossing, with some slight variations (Table 3.1-1).

3.1.1.2 Public Utility

Navigational Use

As discussed in Section 1.3, all of Davidson Creek is located in a remote wilderness area, and has no established history of navigation. The possibility that Davidson Creek holds potential navigational value for recreation, small commercial and Aboriginal traditional use was investigated.

Much of the land around Davidson Creek is rated with a recreational use value of Moderate Sensitivity – Moderate Significance (Figure 1.3-5 and Section 1.3.2.1), while the land around the lakes in the upper reaches of Davidson Creek (lakes 01538UEUT and 01428UEUT) is rated as Moderate Sensitivity – High Significance (RISC 1998). Since the provincial government database that these values were sourced from doesn't indicated what portion of this value relates to navigation, and there is no sign of navigational use in the creek itself, the characterization of the use of Davidson Creek for navigation is left to evidence derived from consultation.

Although navigation is reported to occur in the regional area, based on the consultation record, navigational use of Davidson Creek in the Project area was not identified. Statements made by a Lhoosk'uz Dene Nation member and from the Tatelkuz Lake Ranch Resort both indicate that Davidson Creek is not suitable for navigation (Table 3.1-1, #1 and #2). The Nechako Valley Sporting Association

reported no knowledge of use of Davidson Creek for navigation, fishing, or other use (Table 3.1-1, #5). The Moose Lake Lodge and Fawnie Mountain Outfitters reported that the headwaters of Davidson Creek are not of interest for fishing due to lack of access and fish of interest (Table 3.1-1, #8).

The consultation record and available information gathered regarding navigational use of Davidson Creek indicates this creek has ***no established use for navigation***, and that it is ***not suitable for potential future navigation*** either.

Navigational Access

The ROC indicates that there is no established public navigational use of Davidson Creek. To determine if the creek is navigable in this circumstance under common law (due to the Coleman principle that a stream not currently used for navigation, but with the potential to be used might be navigable (1983)) requires looking into not only the physical characteristics, but also whether the public would have reasonable means or desire to access the creek for navigation.

Mining projects must restrict public access to mining property under the BC *Mines Act* (1996) to ensure safety and security, and for preventing potential effects to ambient environments. Road access to the Project will be via the new MAR from the Kluskus-Ootsa FSR and only mine employees, contractors, and visitors on mine business will be allowed on the Project mine property. The TSF will also be a monitored and controlled impoundment with no public access. The Project Access Management Plan includes access management that includes the installation of locking gates to prevent public use of the new MAR in RMZ 17 on Davidson Road near the Turtle Creek crossing. Provision of a gated access will allow for continued surveillance of all traffic accessing the mine site. Any public traffic wanting to proceed beyond the security gate will be required to check in and obtain a briefing on road rules and other items detailed in the traffic management plan. Authorized use of on- and off-road vehicles for the Project only will also be restricted to established roads and designated trails, except as needed to access monitoring sites and remote communications equipment (AMEC 2013f).

Figure 1 in Appendix C provides an aerial tour down the reaches of Davidson Creek, illustrating the lack of access to the creek. During the Project life, the current exploration road that will be left dormant (for egress purposes) will also be locked to prevent public use. As shown in Figure 1.3-3 and discussed in Section 1.3.2, the Vanderhoof LRMP Access Management Plan restricts the recreational access in and around much of Davidson Creek to SPNM, indicating that, aside for industry access to resources, public access is limited to non-motorized methods such as horseback and hiking. The area does have some resource development service roads in the area of the deposit where the open pit is proposed (Figure 1.3-5, thin dotted red lines), but under the Access Management Plan these roads in the non-motorized areas (Figure 1.3-3) are supposed to be restricted to public access, and any access to them is considered to be in violation of the LRMP Access Management Plan.

Comments by Batnuni Lake Guides & Outfitters Ltd. in Table 3.1-2 indicate that some of the forest resource roads—which are supposed to be barred to public access by locked gates—are non-compliant, and some people disregard the restrictions as well. This lack of enforcement of the restricted access provisions in this area has led to the use of motorized vehicles on the roads to conduct activities such as hunting. Lack of enforcement is confirmed by one stakeholder reporting vehicle access to Davidson Creek for fishing (Table 3.1-2, #3). This access to Davidson Creek indicates a discrepancy between planned and actual access to Davidson Creek, particularly for the lower reaches where some of the forest service roads are present. It is not anticipated that this access would lead to navigational use of Davidson Creek since this channel is reportedly not suitable for navigation, and those currently accessing the lower reaches have correspondingly not reported navigational use either, only fishing.

The ROC (summarized in Table 3.1-2) does not provide any indication of public access to Davidson Creek for the intent of using the creek for navigation. A member of the Lhoosk'uz Dene Nation indicates that access to other areas around Tatelkuz Lake (like Davidson Creek) is hard as, "Can't pack your canoe on a horse and fish in the other locations" (Table 3.1-2, #14). The Lhoosk'uz Dene Nation has reported historical access to areas in and around the Project site for traditional Ulkatcho gatherings, though not for navigation (Table 3.1-2, #10). Access to the area was reported for hunting, hiking, traditional gatherings and fishing, confirming the physical evidence that the creek is not of reasonable appeal to use for navigation.

Regarding the provincial recreational map designation of the area around the upper reaches of Davidson Creek (including the two headwater lakes), as Moderate Sensitivity – High Significance (Figure 1.3-5), it is inferred from the consultation record (not valuable for fishing and not accessible except via methods such as hiking or horseback riding (Table 3.1-2, #8, #10 and #14), that the high recreational significance of this area is attributed to the use of the land, not navigational use of the waters. The lack of road, air or water access to this area, and the inability to bring in navigational vessels via primitive methods, prevent the feasible use of waters in this area for navigation.

The result of information gathering through consultation indicates that access to some reaches of Davidson Creek is possible through use of resource roads, which is non-compliant with the Access Management Plan of the Vanderhoof LRMP (Section 1.3.2.1), and therefore not considered legitimate public access to the creek. Access to Davidson Creek is also possible by semi-primitive methods such as hiking and horseback that have no reported association with navigation; rather the lack of feasibility to bring in a vessel to use for navigating has been indicated.

It is concluded that while ***some areas near Davidson Creek have limited access via semi-primitive methods such as horse and hiking, most of Davidson Creek is inaccessible for navigational purposes under the Vanderhoof LRMP Access Management Plan restrictions***.

Connectivity

If Davidson Creek had navigable reaches connected to Chedakuz Creek (which it flows into and is physically considered to be navigable), it could be considered part of a navigational network. However, none of the reaches of Davidson Creek have been deemed to be part of a larger navigational network in Table 3.1-1 since its lower reaches have been deemed to be not physically navigable, disconnecting the creek as a whole from Chedakuz Creek. Davidson Creek is also punctuated by reaches which are minor (10 and 11) as well as characterized by Low to Very Low physical navigability in Table 3.1-1 (reaches 1 to 3, reach 7.1, and reach 12) which interrupts the ability of this creek as a whole to serve as a connected aqueous highway along its length. In addition, since land access to Davidson Creek under the Vanderhoof LRMP is restricted to SPNM, this disallows public motorized access to the Creek. Therefore, ***none of the reaches of Davidson Creek are considered to form part of a larger navigational network***. In addition, reach 12 and reach 13 (Lake 01682LNRS) of Davidson Creek are cut off from any modes of public access or navigational access, so are not considered to be more than isolated waters that are not part of a navigational network.

Similarly, reaches 1 to 3 of Creek 704454 are also designated as SPNM under the Vanderhoof LRMP, and not part of a larger navigational network as this creek is a tributary to reach 9 of Davidson Creek, which is itself not deemed to be part of a larger navigational network. These Creek 704454 reaches, as well as the reaches of Davidson Creek (6 to 11) that are in the Mine Site area, will also not be publically accessible due to access restrictions for the Mine Site that will be in place during the Project life discussed in the previous section, limiting connectivity to land transit corridors, so they are not considered to be part of a ***navigational network***.

3.1.2 Chedakuz Creek

3.1.2.1 Physical Capability to Support Navigation

Chedakuz Creek (Reach 15) flows out of Tatelkuz Lake (Davidson Creek is a tributary to it (at point 1 in Figure 2.2-2). Chedakuz Creek is rated as having High capacity to support navigation in Table 3.1-1 due to it being a large creek with an average bankfull width of about 27 m, which would support passage of floating vessels such as canoes or kayaks with relative ease. This creek also has no obstacles observed in the field, so is characterized predominantly by clear navigable passage. Reach 15 of Chedakuz Creek is therefore considered ***physically navigable***.

3.1.2.2 Public Utility

Navigational Use

The consultation record indicates navigational use of Chedakuz Creek by canoe or kayak (Table 3.1-2, #31). Fishing is also reported on this creek by other respondents, though not indicating whether this fishing is from a boat or from shore.

The result of information gathering on navigational use of Chedakuz Creek indicates that, though it has limited public use, the creek has ***established navigational use***, and therefore is a **navigable water**.

Navigational Access

Several respondents indicated living near or having access to the reach of Chedakuz Creek downstream from Tatelkuz Lake, which is used by some for fishing (Table 3.1-2, #31, #32, #34, #35, and #37). Access to Chedakuz Creek is reported via road, trails, and by water (by canoe and kayak) from Tatelkuz Lake.

The result of information gathering through consultation indicates that there is ***limited but reasonable public access to Chedakuz Creek***.

Connectivity

Chedakuz Creek is connected to, and therefore considered to be part of the same navigational network as Tatelkuz Lake. The creek also becomes a larger channel as it proceeds downstream, where it is also likely connected to other transportation routes (Figure 1.3-1). Therefore Chedakuz Creek is considered to be ***part of a larger navigational network***.

3.1.3 Creek 704454

3.1.3.1 Physical Capability to Support Navigation

Creek 704454 (with non-minor reaches 1 to 3) is a tributary to Davidson Creek near its break between reach nine and 10 located within the TSF footprint Site D (Appendix D, Figure 3.1-1). Reach 3 of Creek 704454 is rated as having a Low physical capacity to support navigation in Table 3.1-1; it has a very small average width (3.4 m) and shallow depth (0.55 m), and has four recorded blockages to navigation, so is considered generally characterized by obstruction. As shown in Plates 16 to 18 (Appendix C), the number of obstructions may be in fact higher as there is considerable blowdown of MPB deadwood along reach 3, which is likely to increase in the future due to the amount of standing dead wood flanking the creek. This reach is therefore considered physically ***not reasonably capable of supporting navigation***.

Reaches 1 and 2 of Creek 704454 in Table 3.1-1 are rated as having Very Low capacity to physically support navigation. Reach 2 (17) has an average bankfull width of 3.02 m which makes it very close to

being a minor water under the old MWWO initial review test (Appendix D, Section 2.2.1.1), and it also has 10 observed obstructions to navigation along its length, rendering this reach as markedly characterized by obstruction to passage; therefore this reach is deemed not physically navigable. Reach 1 (Appendix C, Plate 16) also has a small bankfull width (3.43 m) and has 4 observed blockages to navigation, so this creek is also considered ***not to be reasonably capable of supporting navigation***.

3.1.3.2 Public Utility

Navigational Use

The navigational use of Creek 704454 is considered to be the same as that for the upper reaches of Davidson Creek, to which it is a tributary. Reaches 1 to 3 of Creek 704454 are located in a remote wilderness area, with no established history of navigation, and no promising potential of use either due to its location and poor physical capacity to support navigation. The ROC for the Project also reveals no indication by stakeholders or Aboriginal groups of the use of this creek.

Based on available information, Creek 704454 has ***no established use for navigation***, and is considered ***not suitable for potential future navigation*** either.

Navigational Access

The ROC indicates that there is no established public navigational use of, nor access to, Creek 704454. Similar to the case for Davidson Creek, since Creek 704454 is within the mine site, public access will be restricted to this creek. Additionally, the Vanderhoof LRMP Access Management Plan restricts the recreational access in and around reaches 1 to 3 of the creek. Therefore, access to this creek is considered to be, has been, and will likely continue to be ***limited to the public*** for physical, mine site safety, and land use management reasons.

Connectivity

Similar to many reaches of Davidson Creek, Reaches 1 to 3 of Creek 704454 are also designated as SPNM under the Vanderhoof LRMP, and not part of a larger navigational network as this creek is a tributary to reach 9 of Davidson Creek, which is itself not deemed to be part of a larger navigational network. These Creek 704454 reaches, as well as the reaches of Davidson Creek (6 to 11) that are in the Mine Site area, will also not be publically accessible due to access restrictions for the Mine Site that will be in place during the Project life discussed in the previous section, limiting connectivity to land transit corridors; these reaches are ***not considered to be part of a wider navigational network***.

3.1.4 Tatelkuz Lake

Tatelkuz Lake is not on the mine site, but will indirectly be affected by flow changes (Section 1.4.4 and Appendix D, Section 3.1.1.3) as a result of the Project drawing water from the lake as part of the freshwater supply system; the lake will also be directly affected by the water intake work for the freshwater supply pipeline (FSS-000).

3.1.4.1 Physical Capability to Support Navigation

Tatelkuz Lake is classified non-minor (Appendix D, Table 3.1-13), primarily due to its large size (927 ha). The lake also has a volume of 188 Mm^3 and a mean depth of 20 m (Section 1.3.1.2). For this reason, it is considered to have sufficient capacity to float several small to medium size floating vessels and therefore be ***physically navigable***.

3.1.4.2 Public Utility

Navigational Use

The consultation record indicates navigational use of Tatelkuz Lake by several respondents. Tatelkuz Lake Ranch Resort has a boat and canoes and kayaks available for lake use for recreational purposes (Table 3.1-2, #12). The Lhoosk'uz Dene Nation has members living on Tatelkuz Lake that have used the entire lake for navigation for purposes such as subsistence fishing, hunting and gathering; they have also reported historic lake navigation by the Kluskus people and Saik'uz people, and more recent observed use by Tatelkuz Lake Ranch Resort goers, and some limited use by recreationalists (Table 3.1-2, #13, #14 and #15). Nechako Lodge and Aviation and another individual also reported use of Tatelkuz Lake by floatplanes (Table 3.1-2, #16 and #18).

The result of information gathering and consultation on navigational use of Tatelkuz Lake indicates that, though it has limited public use, the lake has an ***established use for navigation***, and therefore is a **navigable water**.

Navigational Access

Under the Vanderhoof LRMP, access to the shores of Tatelkuz Lake is SPM (Figure 1.3-3) which allows for public motorized access, unlike along Davidson Creek which is restricted to SPNM. Several comments in Table 3.1-2 indicate that there is public access to Tatelkuz Lake and the lands around it. There is a recreational tourism lodge on the lake and several members of the Lhoosk'uz Dene Nation have cabins, houses, or lands around the lake that are traditionally accessed for hunting, gathering and cultural reasons.

The result of information gathering through consultation indicates that there is limited but ***reasonable public access to Tatelkuz Lake*** via road, trails, by water via Chedakuz Creek, as well as by floatplane.

Connectivity

Tatelkuz Lake has motorized access to it, connecting it to land transit networks. The lake is also connected to Chedakuz Creek (both where it flows into the lake and out of it), as well as Grease Trails (Messue Wagon Trail), so it is therefore considered part of a larger navigational network, and ***is publically accessible*** from multiple points of access, including potentially by float plane.

3.1.5 Nechako and Stellako Rivers

The Nechako and Stellako rivers are two larger rivers in the Project region that will be crossed by the proposed off-site transmission line and re-routes.

3.1.5.1 Physical Capability to Support Navigation

Aerial crossings for the Project have been identified to be scoped into further jurisprudence assessment in Appendix D, Section 3.1.2.4, Table 3.1-13 over the Nechako River (TL-1065) and Stellako River (TL-937 and SR-003). These three waters have been further assessed for physical navigability in Table 3.1-1.

The TL-1065 (Nechako River; Appendix D, Figure 3.1-5) transmission line crossing water section has been deemed to be non-minor due to its width of approximately 90 m (Appendix D, Table 3.1-13), which exceeds the 30 m width threshold and other criteria for minor aerial cable works set out in the Minor Works Order (Department of Transport 2014). Due to their larger size (21 m and 25m), lack of obstacles to passage, and status as having established navigation in the region, the two reaches of the Stellako

River (SR-003 and TL-937; Appendix D, Figure 3.1-7) have also been scoped into this assessment despite having minor works under the Minor Works Order. The two Stellako River crossings and one Nechako River crossing sections are considered physically capable of supporting navigation by several types of floating craft, and are therefore considered ***physically navigable***.

3.1.5.2 Public Utility

Navigational Use

Navigational use of waters in the Project region, but not interacting with the Project, is reported in the consultation record. Navigation is reported for the Nechako and Stellako rivers that the transmission line for the Project will cross (Table 3.1-1, #38 and #43); these two rivers are already well known for navigational use in the area (Section 1.3.2) and they are both considered ***navigable***. Float planes are also known to access the Nechako and Stellako rivers.

Consultation records with the Northwest Brigade Paddling Club has reported that the Nechako and Blackwater rivers see frequent use at most waters levels and on all stretches, and that smaller streams would see local use in the spring and fall. The Blackwater River will not be affected by the Project, and the Nechako River will be crossed by the transmission line as described in Section 1.4.4.

Navigational Access

The Nechako and Stellako rivers both are accessible via road or float plane access, and do not have any access restrictions per the Vanderhoof access management plan (Figure 1.3-3). Therefore these two rivers are considered to be ***publically accessible***.

Connectivity

Both the Nechako and Stellako rivers are larger waterways that have well established navigation and connectivitiy to other waters along their channels, so are considered to serve as part of ***wider navigational network*** as corridors themselves.

3.1.6 Turtle and Unnamed Creeks

One of the MAR bridge crossings deemed non-minor in Table 3.1-1 (Appendix D, Figure 3.1-2, Section 3.1.2.2) is over Turtle Creek (AP-007; Appendix C, Plate 35). In addition, two of the crossings to support the freshwater pipeline that involve bridge upgrades have been scoped into the assessment as non-minor works that cross unnamed creeks (Appendix D, Section 3.1.2.3, Table 3.1-13): FSS-003 and FSS-008.

3.1.6.1 Physical Capability to Support Navigation

The AP-007 bridge upgrade crossing is very close to the transmission line crossing along Turtle Creek (TL-958; Appendix D, Figure 3.1-2; Appendix C, Plate 35; Appendix D, Table 3.1-13, exempt as a minor work), and the stream has similar characteristics at both crossings. The stream width is very narrow for this creek (i.e., mean bankfull width of 3.2 m), but this stream has been assessed in the field as being potentially navigable, with no obstructions to passage in Table 3.1-1. Therefore, it is conservatively considered capable of supporting small floating vessels, and is ***physically navigable***.

The FSS-003 and FSS-008 crossings are marked by obstruction and a low capacity to support navigation (Table 3.1-1) and so are considered ***not physically navigable***.

3.1.6.2 Public Utility

Navigational Use

The ROC did not reveal information on the use of Turtle Creek or the unnamed creeks crossed by FSS-003 or FSS-008 as being used for navigation, so it is assumed that these waters do ***not reasonably have an established public use for navigation***.

Navigational Access

Turtle Creek has more limited access, and it is rated as SPNM, restricting public access (Figure 1.3-3). The unnamed creeks crossed by the pipeline road also have low public access due to their restricted SPNM access designation, therefore these reaches are considered to have ***limited public access***.

Connectivity

Turtle Creek flows into Chedakuz Creek downstream of Davidson Creek, and since Chedakuz Creek is considered to be navigable at Reach 15, Turtle Creek has conservatively been considered to be ***part of a navigational network*** in Table 3.1-1. The two unnamed creeks with bridge upgrades for the FSS-003 and FSS-008 freshwaters pipeline crossings are ***not considered to be part of a navigational network*** (Table 3.1-1).

3.1.7 Navigability Assessment Summary

The result of the navigability assessment of waters that will be affected by the Project based on jurisprudence criteria is shown in Table 3.1-1 (far right column). Of all the waters assessed for navigability by the Proponent, the following are considered navigable: the Nechako and Stellako rivers, Tatelkuz Lake, and Turtle Creek. While Chedakuz Creek is considered navigable, this water is downstream of mine site works, has no direct works that will affect it, and will only be subject to flow effects of the Project. Predicted flow effects to Chedakuz Creek as well as other creeks that will be affected by the Project are summarized in Appendix D, Section 3.1.1.3.

3.2 NPA PERMITTING CONSIDERATIONS

3.2.1 NPA Approvals of Works

The assessment has found that the following five works are deemed to be over navigable waters:

- Nechako River (TL-1065);
- Stellako River (TL-937 and/or SR-003);
- Turtle Creek (AP-007); and
- Tatelkuz Lake (FSS-000).

Dependent on TC's review and advice, New Gold may opt in under s.4 of the NPA (1985) to the approval process and submit Notice of Works for the above works. Engineering drawings for representative Project works for these crossings are included in Appendix B.

3.2.2 Applicability of *Navigation Protection Act* Deposit and Dewatering Prohibitions

3.2.2.1 Applicability Based on Navigability Assessment Results

As discussed in Section 1.2.1.2, s.23 of the NPA on dewatering is not deemed to apply to the drawing of water from Tatelkuz Lake since lake levels will be negligibly affected.

Regarding the NPA s.22 prohibition against depositing material into a navigable water, the navigability assessment in this report has found that none of the reaches affected by depositing material into the TSF in the mine site (e.g., Davidson Creek and Creek 704454) are navigable. This includes both the waters found in the Appendix D assessment as minor (and therefore not navigable based on basic physical characteristics), and those reaches found to be non-minor in Appendix D, and then assessed as not navigable in the Section 3.1 assessment based on physical characteristics of navigability derived from jurisprudence. The NPA s.22 only applies to "navigable waters" (Section 1.2); therefore, since the reaches affected by the TSF (and its contained tailings) are not deemed to be navigable, then the NPA s.22 prohibitions are not considered to apply to these waterways. It remains for TC to review and make the final determination of navigability of the waters affected by the TSF and applicability of s.22. Dependent on TC's findings and advice on permitting needs under the NPA, New Gold may submit information needed towards a GIC proclamation of exemption if required.

In addition, it is noted that the situation of deposition of tailings into an engineered TSF enclosure is markedly different from depositing material into a natural waterway. It is the dams (or other flanking structures) of an engineered TSF along a creek that may potentially interact with or affect navigation. In addition, since the TSF will be managed to contain the tailings within the TSF, there is no possibility of the material normally being carried downstream to potentially obstruct any downstream navigation.

3.2.2.2 Conclusion on the Need for an NPA Section 24 Application

As discussed above, s.22 of the NPA (1985), regarding prohibited activities is deemed not applicable to the Project primarily due to the assessment findings that the waterways within and downstream the TSF footprint are not navigable, and the NPA as a whole only applies to navigable waters. The final determination of navigability rests with TC, and New Gold will work with TC upon their review of this report to provide any extra information to support the amended review process under the NPA.

This report concludes that, since s.22 of the NPA (1985) does not apply, an application under s. 24 of the NWPA for a GIC proclamation of exemption of the waterways under the Project TSF footprint will *not* be required for the Project. It remains for TC to determine if they concur with this finding.

Notwithstanding the above conclusions, as a precautionary and conservative measure in the event that TC provides a different rationale and interpretation of s.22 applicability to the Project, this report contains much of the information required to support an application for a s.23 GIC declaration of exemption for the affected waters as outlined in the two-page guidance document from TC (Transport Canada 2013b). For instance, the extended discussion of the navigable use of lands in and around the mine site area (Section 1.3.2), the results of stakeholder consultation regarding the public utility and value for navigation of the waters affected by the TSF (Section 3.1) is provided towards this purpose. Further information may also be submitted for the Project based on advice from TC following the review of this report.

4. Conclusions

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4. Conclusions

The Blackwater Project will involve components at the mine site (i.e., pits, waste rock dumps and the TSF) as well as off-site linear components (i.e., transmission line, freshwater pipeline, the MAR, and FSR upgrade) that will interact with waters. The result of the assessment of the navigability of waterbodies identified in Appendix D affected by the Project utilizing criteria established through common law is that four waters (affected by five works) ways were found to be navigable, as summarized in Table 4.1-1. Chedakuz Creek is also deemed navigable, but it will not be directly affected by any work, and is only subject to downstream flow effects as discussed in Appendix D, Section 3.1.1.3.

Table 4.1-1. Waters Affected by Blackwater Project Deemed to be Navigable

Water	Work ID	Work	Project Component
Nechako River	TL-1065	Aerial crossing	Transmission line crossing
Stellako River	TL-937 or SR-003	Aerial crossing	Transmission line (either main route of Stellako re-reroute)
Turtle Creek	AP-007	Bridge crossing	Mine Access Road (MAR)
Tatelkuz Lake	FSS-000	Water intake	Freshwater supply

Based on the results of TC's advice pending their review of this assessment, New Gold may be submitting Notice of Works per s.4 of the NPA for the works listed in Table 4.1-1. Regarding applicability of Prohibited Activities in s.22 of the NPA, this report deems that Davidson Creek and other reaches affected by the TSF activities (i.e., for Davidson reach 9 and Creek 704454 reaches 1 to 3) are not navigable. It has also been found that S.23 does not apply since the drawing of water from Tatelkuz Lake will be negligible, and dewatering is defined as drying out of a waterbody. It remains for TC to review and confirm the findings in this report, including the navigability of the waters affected by the TSF, and advise on whether an application for a GIC exemption be required for any of the Project activities or not. In the event that TC determines that s.22 does apply, there is extra information towards a potential application under s.24 of the NPA included in this report. New Gold will also work with TC to provide additional information as necessary towards supporting the revised regulatory review process under the NPA.

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Appendix A

Blackwater Project Field Observations for All Drainages (Including Non-classified Drainages, and No Visible Channel) — On-site and Off-site

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Appendix A. Blackwater Project Field Observations for All Drainages (including Non-classified Drainages, and No Visible Channel) – On-site and Off-site

Table 1. Blackwater Project Baseline Field Studies Sampled Stream Sites Data – On-site and Off-site

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
28	1	Mine Site	Trib to Davidson Ck.	-	372641 E 5895562 N	TSF Site C - Bog/Wetland Area	Bed eliminated	1024	1.18	0.37	5	ns	ns	No	Initial	Narrow and shallow channel with steep slope	100-567134-610692-522527-899664
45	2	Mine Site	Trib to Davidson Ck.	-	375028 E 5896712 N	TSF Site D Tailings Pond	Bed eliminated	1774	0.40	0.47	1.83	ns	ns	No	Initial	Shallow; dominant substrate is cobble.	100-567134-610692-522527-776798
23	4	Mine Site	Trib to Davidson Ck.	-	376522 E 5897921 N	TSF Site D Tailings Beach; TSF Main Site D Dam	Bed eliminated	1430	0.75	0.17	1.5	ns	ns	No	Initial	Shallow and narrow channel	100-567134-610692-522527-674890
24	5	Mine Site	Trib to Davidson Ck.	reach 1	376723 E 5898562 N	Haul Road; Mine Footprint		1088	1.53	0.2	2	ns	ns	No	Initial	Shallow channel	100-567134-610692-522527-636713
30	6	Mine Site	Trib to Davidson Ck.	reach 4 and 5	374985 E 5898930 N	Haul Road; TSF Main Site D Dam; TSF Site D Tailings Beach	Bed partially eliminated	1072	1.17	0.47	4	ns	ns	No	Initial	Shallow, narrow and steep	100-567134-610692-522527-636713
31	7	Mine Site	Trib to Davidson Ck.	-	374679 E 5898877 N	TSF Site D Tailings Beach	Bed eliminated	1438	0.98	0.53	4.5	ns	ns	No	Initial	Shallow, narrow and steep	100-567134-610692-522527-636713-637972
20	9	Mine Site	Ck. 704454	reach 6	374009 E 5894113 N	West Dump; Mine Footprint; Low Grade Stockpile	Bed eliminated	1196	0.93	0.27	5.33	ns	ns	No	Initial	Shallow and narrow channel; steep slope	100-567134-610692-522527-704454
21	10	Mine Site	Ck. 704454	reach 7	373370 E 5892175 N	West Dump; Mine Footprint	Bed partially eliminated	428	0.6	0.27	11.67	ns	ns	No	Initial	Shallow and narrow channel; steep slope	100-567134-610692-522527-704454
33	11	Mine Site	Trib to Ck. 704454	-	373653 E 5894159 N	West Dump	Bed eliminated	3002	0.43	0.37	2.5	ns	ns	No	Initial	Too narrow	100-567134-610692-522527-704454-569241
32	12	Mine Site	Trib to Ck. 704454	-	373877 E 5894102 N	West Dump	Bed eliminated	1106	1.42	0.27	4	ns	ns	No	Initial	Too shallow and steep	100-567134-610692-522527-704454-569241-068254
36	13	Mine Site	Trib to Ck. 704454	-	374883 E 5893049 N	Open Pit; Mine Footprint; Low Grade Stockpile	Bed eliminated	2423	1.17	0.15	16.5	ns	ns	No	Initial	shallow and narrow channel; steep slope	100-567134-610692-522527-704454-503067
37	14	Mine Site	Trib to Ck. 704454	-	373709 E 5892235 N	Mine Footprint	Bed eliminated	323	2.93	0.27	7.3	ns	ns	No	Initial	Shallow channel; steep slope	100-567134-610692-522527-704454-853864
40	15	Mine Site	Ck. 146920	reach 3	376609 E 5893983 N	East Dump	Bed eliminated	660	1.21	0.3	0.5	ns	ns	No	Secondary	Shallow channel with steep upper sections; upper reaches (4 and 5) are NCD	100-567134-610692-671007-505659-146920
43	17	Mine Site	Ck. 505659	reach 7	376031 E 5894825 N	Top Soil Stockpile - East of Site D Dam	Bed eliminated	1525	0.67	0.3	0.7	ns	ns	No	Initial	Narrow and shallow channel	100-567134-610692-671007-505659
42	18	Mine Site	Ck. 505659	reach 6	376313 E 5895933 N	Conveyor; Transmission Line; Access Road; Mine Road; Water Pipeline		1477	0.78	0.43	1.9	ns	ns	No	Initial	Narrow channel	100-567134-610692-671007-505659
44	19	Mine Site	Trib to Ck. 505659	-	376370 E 5895895 N	TSF Site D Tailings Beach	Bed eliminated	619	0.73	0.13	0.5	ns	ns	No	Initial	Narrow and shallow channel	100-567134-610692-671007-505659-764541

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
22	20	Mine Site	Trib to Davidson Ck.	reach 7	377117 E 5899691 N	No Works	D/S of works	524	0.98	0.3	1.39	ns	ns	N/A	Initial	Channel in not visible (NVC) in some parts and narrow and shallow channel in other parts	100-567134-610692-522527-428073
12	22	Mine Site	Davidson Ck.	reach 10	373161 E 5895662 N	TSE Site C Bog/Wetland Area; TSE Site C Pond; TSE Site C Tailings Beach; TSE Site C Main Dam; Haul Road; TSE Site D Tailings Pond ; TSE Site D Tailings Beach	Bed eliminated	5602	2.74	0.51	0.8	ns	ns	No	Secondary	Most channel section are shallow (< 0,5 m); substrate in some sections consist of cobble/boulder; log jams	100-567134-610692-522527
13	23	Mine Site	Davidson Ck.	reach 11	371792 E 5894792 N	Site C Saddle Dam; TSF Site C - Upland Beach; TSE Site C Bog/Wetland Area	Bed eliminated	853	2.04	0.41	1.8	ns	ns	No	Secondary	Channel shallow (<0.5 m) in most sections; 3 sections consist of steep boulder cascades	100-567134-610692-522527
29	24	Mine Site	Trib to Davidson Ck.		372705 E 5895478 N	TSF Site C Bog/Wetland Area	Bed partially eliminated	813	1.56	0.35	6.67	ns	ns	No	Secondary	Shallow channel with steep sections	100-567134-610692-522527-896157
25	25	Mine Site	Trib to Davidson Ck.	reach 2 and 3	375780 E 5898392 N	TSF Site D Tailings Beach; TSF Site D Tailings Pond; TSF Main Site D Dam	Bed eliminated	1645	1.33	0.43	1	ns	ns	No	Secondary	Shallow channel	100-567134-610692-522527-636713
39	26	Mine Site	Ck. 146920	reach 2	377281 E 5893946 N	East Dump; Mine Footprint; Mine Road	Bed partially eliminated	3240	1.58	0.37	3.88	ns	ns	No	Secondary	Shallow sections with cobble, some steeper sections in reach below	100-567134-610692-671007-505659-146920
26	27	Mine Site	Ck. 688328	reach 1	374945 E 5898027 N	TSF Site D Tailings Pond; TSF Site D Tailings Beach	Bed eliminated	2436	2.37	0.41	1.4	ns	ns	No	Secondary	Shallow channel	100-567134-610692-522527-688328
27	28	Mine Site	Ck. 688328	reach 2	371962 E 5898019 N	Tailings Pipeline; TSF Site D Tailings Pond	Bed partially eliminated	1065	1.78	0.36	1.8	ns	ns	No	Secondary	Shallow channel	100-567134-610692-522527-688328
41	29	Mine Site	Ck. 505659	reach 5	377907 E 5895794 N	TSF Site D Tailings Beach; Mine Road	Bed partially eliminated	2378	1.52	0.33	0.5	ns	ns	No	Secondary	Shallow channel	100-567134-610692-671007-505659
8	30	Mine Site	Ck. 704454	reach 4	375072 E 5895202 N	Mine Footprint; Site D Tailings Pipeline; TSF Site D Tailings Beach	Bed eliminated	1347	2.61	0.43	2.5	ns	ns	No	Secondary	Shallow channel with 2 steep cascade sections	100-567134-610692-522527-704454
19	31	Mine Site	Ck. 704454	reach 5	374624 E 5894718 N	Low Grade Stock Pile; Haul Road; Mine Footprint	Bed eliminated	1164	2.34	0.42	1.7	ns	ns	No	Secondary	Shallow channel with some steep section (>7%) U/S	100-567134-610692-522527-704454
34	32	Mine Site	Trib to Ck. 704454	-	373689 E 5893994 N	West Dump; Mine Footprint	Bed eliminated	1385	1.81	0.53	2.25	ns	ns	No	Secondary	Shallow channel	100-567134-610692-522527-704454-569241-076095
2	33	Mine Site	Davidson Ck.	reach 1	384224 E 5907707 N	No Works	D/S of works	-	6.41	0.72	0.4	ns	5	N/A	No	Log jam and LWD (4)	100-567134-610692-522527
3	34	Mine Site	Davidson Ck.	reach 2	383988 E 5907428 N	No Works	D/S of works	-	6.44	0.62	0.5	ns	10	N/A	No	Shallow riffle section, log jams (6), and LWD (4)	100-567134-610692-522528
4	35	Mine Site	Davidson Ck.	reach 3	383498 E 5907141 N	No Works	D/S of works	-	6.03	1	0.3	ns	4	N/A	No	Shallow riffle sections and LWD (4)	100-567134-610692-522529
5	36	Mine Site	Davidson Ck.	reach 4	383045 E 5906220 N	No Works	D/S of works	-	6.92	0.71	1	ns	2	N/A	No	2 log jams	100-567134-610692-522530
6	37	Mine Site	Davidson Ck.	reach 5	381843 E 5904042 N	No Works	D/S of works	-	5.66	0.53	0.4	ns	4	N/A	No	4 log jams	100-567134-610692-522531

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
7	38	Mine Site	Davidson Ck.	reach 6	378203 E 5899307 N	Fresh Water Reservoir; Mine foot print; Haul Road; Access Road; Transmission Line	Bed partially eliminated; receives diverted water	1804	5.19	0.5	0.6	ns	1	No	No	Shallow channel with fallen logs	100-567134-610692-522532
8	39	Mine Site	Davidson Ck.	reach 7	377998 E 5899063 N	Fresh Water Reservoir	Bed eliminated	232	5.08	0.45	2.1	ns	1	No	No	Shallow channel with log jam	100-567134-610692-522533
9	40	Mine Site	Davidson Ck.	reach 7.1	377728 E 5898790 N	Fresh Water Reservoir	Bed eliminated	788	6.44	0.54	2.1	ns	0	No	No	Shallow and steep (>4%) sections; large boulders	100-567134-610692-522534
10	41	Mine Site	Davidson Ck.	reach 8	377343 E 5898429 N	Mine Footprint; Fresh Water Control Dam	Bed partially eliminated; receives diverted water	953	6.9	0.65	1.9	ns	1	No	No	Shallow channel with log jam	100-567134-610692-522535
11	42	Mine Site	Davidson Ck.	reach 9	376196 E 5897820 N	TSE Site D Tailings Beach; TSE Site D Main Dam; Haul Road	Bed eliminated	1116	5.19	0.42	1.8	ns	1	No	No	Shallow channel with log jam	100-567134-610692-522536
14	43	Mine Site	Davidson Ck.	reach 12[2]	371256 E 5894208 N	No Works	U/S of works	62	3.42	0.48	0.5	ns	2	n/a	No	Most sections are < 3m wide with the exception of 2 pools <200 m in length and <0.5 m deep, sections with large boulders; blockages include a beaver dam and braided channel 1.8 m	100-567134-610692-522537
15	44	Mine Site	Ck. 704454	reach 1	376125 E 5897471 N	TSF Site D Tailings Beach	Bed eliminated	892	3.62	0.49	2.4	ns	5	No	No	Shallow channel with steep cascade section	100-567134-610692-522527-704454
16	45	Mine Site	Ck. 704454	reach 2	376086 E 5896933 N	TSF Site D Tailings Beach	Bed eliminated	960	3.02	0.56	3	ns	10	No	No	Shallow channel with 5 steep cascade sections	100-567134-610692-522527-704454
17	46	Mine Site	Ck. 704454	reach 3	375893 E 5895964 N	TSF Site D Tailings Beach	Bed eliminated	195	3.43	0.55	2.6	ns	4	No	No	Shallow channel with fallen logs and 3 steep cascade sections	100-567134-610692-522527-704454
	47	Mine Site	Trib to Davidson Ck.	-	376120 E 5898670 N	TSF Main Site D Dam; Haul Road	Bed eliminated	674	ns	ns	ns	ns	ns	No	ns	Not sampled; designation assessed based on downstream reaches designation and nearby streams	100-567134-610692-522527-636713-214958
	48	Mine Site	Trib to Davidson Ck.	-	376134 E 5898683 N	TSF Main Site D Dam; Haul Road	Bed eliminated	28	ns	ns	ns	ns	ns	No	ns	Not sampled; designation assessed based on downstream reaches designation and nearby streams	100-567134-610692-522527-636713-214958-727555
	49	Mine Site	Trib to Davidson Ck.	-	376905 E 5897818 N	TSF Main Site D Dam; Mine Footprint	Bed eliminated	407	ns	ns	ns	ns	ns	No	ns	Not sampled; designation assessed based on downstream reaches designation and nearby streams	100-567134-610692-522527-670952
	50	Mine Site	Trib to Davidson Ck.	-	376759 E 5897790 N	TSF Main Site D Dam	Bed eliminated	1430	ns	ns	ns	ns	ns	No	ns	Not sampled; designation assessed based on downstream reaches designation and nearby streams	100-567134-610692-522527-674890
	51	Mine Site	Trib to Ck. 704454	-	374531 E 5892900 N	Open Pit; Mine Footprint; West Dump	Bed eliminated	1686	ns	ns	ns	ns	ns	No	ns	Not sampled; designation assessed based on downstream reaches designation and nearby streams	100-567134-610692-522527-704454-686326

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
35	52	Mine Site	Ck. 543585	reach 2	374224 E 5893350 N	Mine Footprint; Operation Camp; Construction Camp	Bed eliminated	1926	1.17	0.4	1.67	ns	ns	No	Initial	Not sampled; data presented and designation based on reach 1 data	100-567134-610692-671007-543585
	54	Mine Site	Ck. 505659	reach 1	388683 E 5899434 N	No Works	D/S of works	-	3.7	0.63	2.33	ns	2	n/a	No	SWD and LWD jams	100-567134-610692-671007-505659
	55	Mine Site	Ck. 505659	reach 2	386031 E 5898475 N	No Works	D/S of works	-	3.9	0.9	1.17		2	n/a	No	Beaver dam	100-567134-610692-671007-505660
	56	Mine Site	Ck. 505659	reach 3	385283 E 5898500 N	No Works	D/S of works	-	6.1	0.57	1.67		1	n/a	No	Beaver dam; relic of log jam	100-567134-610692-671007-505661
38	58	Mine Site	Ck. 146920	reach 1	382643 E 5898525 N	Camp facilities; Transmission Line; Water Pipes; Access Road	Water Diverted	-	1.65	0.47	4.5		ns	No	Secondary	TL-951, TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-610692-671007-505659-146920
	59	Mine Site	Ck. 543585	reach 1	374224 E 5893350 N	No Works	D/S of works	-	1.17	0.4	1.67	ns	ns	n/a	Initial	No comments	100-567134-610692-671007-543585
	60	Mine Site	Ck. 661	reach 1	388683 E 5899434 N	No Works	D/S of works	-	4.87	0.37	2		ns	n/a	No	Shallow channel with LWD < 50 cm	100-567134-610692-671007
	61	Mine Site	Ck. 661	reach 2	386031 E 5898475 N	No Works	D/S of works	-	4.68	0.40	1		ns	n/a	No	Shallow channel with some LWD < 50 cm	100-567134-610692-671007
	62	Mine Site	Ck. 661	reach 3	385283 E 5898500 N	No Works	D/S of works	-	3.88	0.57	0.875	0.875	ns	n/a	No	Shallow sections (<0.25 m) with LWD <50 cm	100-567134-610692-671007
	63	Mine Site	Ck. 661	reach 4	382643 E 5898525 N	No Works	D/S of works	-	3.05	0.3	0.875		ns	n/a	No	Shallow channel with LWD < 50 cm	100-567134-610692-671007
1	64	Mine Site	Chedakuz Ck.	reach 15	385024 E 5908268 N	No Works	D/S of works	940 (100%)	27.1	ns	<1	ns	0	n/a	No	Large creek with no blockages in reach 15.	100-567134-610692
	AA-002	Airstrip Access Road	Unnamed Ck.	n/a	378594 E 5904942 N	Bridge	n/a	-	1.12	0.57	3.5	ns	ns	No	Initial	Several exposed clusters of cobble severely impede navigation.	100-567134-610692-480511-486033
	AE-001	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	382926 E 5908533 N	Bridge	n/a	-	3.9	0.77	1.5	1.09	4	n/a	No	Thick growth of willow in channel.	100-567134-610692-480511
	AE-002	Kluskus-Ootsa Forest Service Road	Turtle Ck.	n/a	383295 E 5908709 N	Bridge	n/a	-	3.3	0.37	1	1.14	4	n/a	No	Grass and sedge in channel would make navigation difficult	100-567134-610692-480511
	AE-003	Kluskus-Ootsa Forest Service Road	Chedakuz Ck.	n/a	383943 E 5909410 N	Bridge	n/a	-	12.1	0.93	3	1.1	0	n/a	No	Frequent mid channel bars and low water levels. Bridge clearance is 3.1m.	100-567134-610692
	AE-006	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	386131 E 5909447 N	Bridge	n/a	-	0.6	0.2	4.5	ns	ns	n/a	Initial	Only 140 m of channel and impassible wetland downstream.	100-567134-610692-520894
	AE-007	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	387959 E 5910160 N	Bridge	n/a	-	2.6	0.55	2.5	1.27	5	n/a	Secondary	Frequent blowdown across channel, navigation would be impacted.	100-567134-610692-522107-063231
	AE-010	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	393225 E 5911777 N	Bridge	n/a	-	0.8	0.7	22	ns	ns	n/a	Initial	Too small and steep to be navigable.	100-567134-610692-522107-363302
	AE-013	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	395715 E 5911590 N	Bridge	n/a	-	0.8	0.4	9.3	ns	ns	n/a	Initial	Small channel.	100-567134-610692-522107-482792

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	AE-014	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	398443 E 5911423 N	Bridge	n/a	-	0.8	0.36	7.5	ns	ns	n/a	Initial	Small channel with frequent dry sections.	100-567134-610692-522107-614160
	AE-019	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	399713 E 5914676 N	Bridge	n/a	-	0.9	0.26	2.5	ns	ns	n/a	Initial	Small, shallow channel.	100-500560-248839-739271-422284-152342
	AE-020	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	399388 E 5915170 N	Bridge	n/a	-	0.5	0.76	1.5	ns	ns	n/a	Initial	Small channel.	100-500560-248839-739271-422284-152342-626462
	AE-021	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	398607 E 5916799 N	Bridge	n/a	-	2	0.45	3.4	1.31	16	n/a	Secondary	Lots of woody debris in stream, limiting navigability.	100-500560-248839-739271-422284
	AE-022	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	398318 E 5922495 N	Bridge	n/a	-	1.1	0.56	2.5	ns	ns	n/a	Initial	Small, shallow channel	100-567134-581072-796569
	AE-030	Kluskus-Ootsa Forest Service Road	Big Bend Ck.	n/a	398735 E 5927483 N	Bridge	n/a	-	7.5	0.67	2.5	1.65	14	n/a	No	Heavily beaver dammed.	100-567134-581072
	AE-035	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	396138 E 5930775 N	Bridge	n/a	-	1.1	0.45	2	ns	ns	n/a	Initial	Small dewatered stream.	100-567134-581072-492383
	AE-044	Kluskus-Ootsa Forest Service Road	Finger Ck.	n/a	401200 E 5937370 N	Bridge	n/a	-	1	0.52	1	ns	ns	n/a	Initial	Small stream	100-567134-069486-983379
	AE-049	Kluskus-Ootsa Forest Service Road	Cabin Ck.	n/a	409226 E 5941021 N	Bridge	n/a	-	2.47	1.13	1	ns	4	n/a	Secondary	Very shallow and rocky with dense overhanging vegetation.	100-567134-069486-983379-238456
	AE-053	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	409648 E 5942978 N	Bridge	n/a	-	0.8	0.58	2.5	ns	ns	n/a	Initial	Impassible NCD/wetland downstream and no connectivity to other waterway U/S.	100-567134-069486-983379-238456-720549-229209
	AE-055	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	409828 E 5945915 N	Bridge	n/a	-	1.3	0.46	2.5	ns	4	n/a	Secondary	No evidence of past use. Overhanging veg limits navingation.	100-567134-483452-693735-476207-081537
	AE-056	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	410190 E 5946427 N	Bridge	n/a	-	1.12	0.61	1.5	ns	0	n/a	Initial	Small, frequently dewatered channel.	100-567134-483452-693735-476207-081537-326085
	AE-057	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	411427 E 5947301 N	Bridge	n/a	-	2	1.1	3	ns	2	n/a	No	Boulders and low flow limit navigation.	100-567134-483452-693735-476207
	AE-058	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	411598 E 5947974 N	Bridge	n/a	-	0.5	ns	3	ns	ns	n/a	Initial	Barriers to fish observed- likely barriers to navigation as well.	100-567134-483452-693735-476207-298703
	AE-059	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	411520 E 5948874 N	Bridge	n/a	-	1.9	0.62	4	ns	3	n/a	Secondary	Boulders and low flows limit navagability.	100-567134-483452-693735-383595
	AE-061	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	411449 E 5951023 N	Bridge	n/a	-	0.9	0.43	20	ns	ns	n/a	Initial	Small stream begins downstream of crossing. Gradient and bankfull width make it minor waters	100-567134-483452-693735-370833

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	AE-068	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	412429 E 5962525 N	Bridge	n/a	-	5.8	0.75	4	1.33	4	n/a	No	Frequent fallen logs fallen over channel. Shallow flows at time of survey.	100-567134-483452-614607
	AE-070	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	415179 E 5967852 N	Bridge	n/a	-	1.2	0.42	2.5	ns	ns	n/a	Secondary	Excessive burned debris in and across channel.	100-567134-269222-562302
	AE-071	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	415339 E 5968546 N	Bridge	n/a	-	2.7	0.47	1.5	ns	4	n/a	Secondary	Too much blowdown in and across channel to be navigable.	100-567134-269222-562302
	AE-072	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	416768 E 5970625 N	Bridge	n/a	-	1.2	0.22	2	ns	ns	n/a	Initial	Small, shallow channel with NCD reach U/S of crossing.	100-567134-269222-562302-308076
	AE-073	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	416787 E 5971489 N	Bridge	n/a	-	1	0.2	1	ns	ns	n/a	Initial	Intermittant small, shallow channel with frequent beaver dams.	100-567134-269222-562302-169262
	AE-074	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	416790 E 5971776 N	Bridge	n/a	-	0.9	0.33	5.5	ns	ns	n/a	Initial	Small, brushy channel with WL U/S.	100-567134-269222-562302-169262-236709
	AE-075	Kluskus-Ootsa Forest Service Road	Stony Ck.	n/a	416805 E 5973117 N	Bridge	n/a	-	1.9	0.5	3.5	1.31	5	n/a	Secondary	Frequent blowdown over channel and overhanging vegetation would impede navagability.	100-567134-269222
	AE-076	Kluskus-Ootsa Forest Service Road	North Stony Ck.	n/a	416816 E 5973555 N	Bridge	n/a	-	1.5	0.68	2.5	1.23	4	n/a	Secondary	Abundant woody debris over stream channel will impede navagability.	100-567134-269222-672757
	AE-907	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	406843 E 5938277 N	Bridge	n/a	-	4.2	0.92	2	1.02	5	n/a	No	Boulders and abundant woody debris would make navigation difficult.	100-567134-069486-983379-338511
	AE-911	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	407960 E 5938545 N	Bridge	n/a	-	1	0.27	3	ns	ns	n/a	Initial	Small, shallow stream	100-567134-069486-983379-338511-133482
	AE-913	Kluskus-Ootsa Forest Service Road	Unnamed Ck.	n/a	409155 E 5940327 N	Bridge	n/a	-	1.1	1	2	ns	ns	n/a	Initial	Small, fishbearing stream that a canoe would not fit into.	100-567134-069486-983379-238456-489341
	AE-914	Kluskus-Ootsa Forest Service Road (kms 102-124)	Unnamed Ck.	n/a	395724 E 5911611 N	Bridge	n/a	-	1.13	0.33	11	ns	2	No	Initial	Small channel; sometime splitting into two channels separatated by a vegetated bar with dry sections; thick vegetation, large bolder and numerous fallen logs preventing navigation	100-567134-610692-522107-482792
	AP-004	Mine Site Access Road	Davidson Ck.	n/a	378962 E 5900138 N	Bridge	n/a	-	6.5	0.46	1.5	1.27	3	No	No	Abundant blowdown across banks, navigation would be extrememly limited.	100-567134-610692-522527
	AP-005	Mine Site Access Road	Unnamed Ck.	n/a	379062 E 5901517 N	Bridge	n/a	-	1.2	0.33	6.3	1.12	3	No	Secondary	Small stream with frequent blowdown across channel.	100-567134-610692-522527-428073
	AP-007	Mine Site Access Road	Turtle Ck.	n/a	378796 E 5905952 N	Bridge	n/a	-	3.2	0.76	1.5	1.64	0	No	No	No evidence of past use. Some shallow bars but navigable with small craft. 0.6m clearance at bridge.	100-567134-610692-480511

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	AP-905	Mine Site Access Road	Unnamed Ck.	n/a	378803 E 5896992 N	Bridge	n/a	-	1.93	0.5	1.5	ns	ns	No	Secondary	Stream is relatively shallow and has numerous blockages. Blockages not tallied because Mean_BfD below threshold for minor waters classification.	100-567134-610692-671007-505659
	FSS-001	Freshwater Supply System	Unnamed Ck.	n/a	387434 E 5902719 N	Pipeline/Bridge	n/a	-	2.05	0.85	3.4	ns	28	No	Secondary	Natural obstacles every 5-10 m	100-567134-610692-579340-140014
	FSS-002	Freshwater Supply System	Unnamed Ck.	n/a	387136 E 5902655 N	Pipeline/Bridge	n/a	-	2.1	0.47	0.98	ns	41	No	Secondary	There are blown down trees with root wads intact every 30 m	100-567134-610692-579340-140014
	FSS-003	Freshwater Supply System	Unnamed Ck.	n/a	385863 E 5902992 N	Pipeline/Bridge	n/a	-	4.47	1	1.4	ns	4	No	No	2 beaver dams and 2 LWD blowdowns across creek	100-567134-610692-571602-151562
	FSS-005	Freshwater Supply System	Ck. 704454	n/a	375417 E 5895470 N	Pipeline/Bridge	n/a	-	3.47	0.42	7.17	ns	49	No	No	Log jams and boulders	100-567134-610692-522527-704454
	FSS-006	Freshwater Supply System	Unnamed Ck.	n/a	385248 E 5902969 N	Pipeline/Bridge	n/a	-	0.3	0.28	0.23	ns	1	No	Initial	1 piece LWD laying across channel	100-567134-610692-571602-449278
	FSS-007	Freshwater Supply System	Ck. 505659	n/a	376283 E 5895524 N	Pipeline/Bridge	n/a	-	1.34	0.23	2.5	2	43	No	Initial	Log jams, subterranean portion, root wads	100-567134-610692-671007-505659-764541
	FSS-008	Freshwater Supply System	Unnamed Ck.	n/a	382740 E 5902701 N	Pipeline/Bridge	n/a	-	3.98	0.72	4.2	ns	29	No	No	Fallen LWD every 5-10 m, numerous SWD jams and 2 large trees down	100-567134-610692-522527-226858-272744
	FSS-009	Freshwater Supply System	Ck. 505659	n/a	378855 E 5897009 N	Pipeline/Bridge	n/a	-	1.26	0.34	2.5	ns	15	No	Secondary	Boulders, narrow channel, fallen tree jam	100-567134-610692-671007-505659-146920
	TL-004	Transmission Line	Davidson Ck.	n/a	378937 E 5900138 N	Aerial Cable	n/a	-	6.5	0.46	1.5	1.27	3	No	No	Abundant blowdown across banks, navigation would be extrememly limited.	100-567134-610692-522527
	TL-023	Transmission Line	Esker Ck.	n/a	395861 E 5920724 N	Aerial Cable	n/a	-	2.3	0.5	3	ns	ns	No	Secondary	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-581072-851257
	TL-025	Transmission Line	Big Bend Ck.	n/a	397313 E 5922083 N	Aerial Cable	n/a	-	4.2	0.46	2	1.05	5	Yes	No	Beaver activity will limit navigation. Within 1000 m of Brewster Lake.	100-567134-581072
	TL-026	Transmission Line	Unnamed Ck.	n/a	398231 E 5922544 N	Aerial Cable	n/a	-	1.1	0.56	2.5	ns	ns	No	Initial	Small, shallow channel	100-567134-581072-796569
	TL-048	Transmission Line	Unnamed Ck.	n/a	388007 E 5940053 N	Aerial Cable	n/a	-	1.23	0.70	3	ns	ns	No	No	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-509773-339107-437144
	TL-054	Transmission Line	Swanson Ck.	n/a	391997 E 5946283 N	Aerial Cable	n/a	-	3.4	0.57	4	ns	ns	No	No	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-509773
	TL-067	Transmission Line	Unnamed Ck.	n/a	397350 E 5956570 N	Aerial Cable	n/a	-	0.9	0.43	2.5	ns	ns	No	Initial	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-483452-005364-346411-246527
	TL-1006	Transmission Line	Unnamed Ck.	n/a	391796 E 5963829 N	Aerial Cable	n/a	-	1.3	0.4	4	ns	ns	No	Secondary	Very low water levels.	100-567134-374775-709017
	TL-1007	Transmission Line	Unnamed Ck.	n/a	391653 E 5964199 N	Aerial Cable	n/a	-	1.18	0.62	2.5	ns	ns	No	Initial	Steep reach in large gulley.	100-567134-374775-948201-077318
	TL-1010	Transmission Line	Unnamed Ck.	n/a	390839 E 5966319 N	Aerial Cable	n/a	-	1.05	0.43	2.5	ns	ns	Yes	Initial	Frequent blowdown across channel, navigation would be impacted.	100-567134-610692-522107-063231

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	TL-1011	Transmission Line	Unnamed Ck.	n/a	390777 E 5966480 N	Aerial Cable	n/a	-	0.73	2.67	1.5	ns	ns	No	Initial	Stellako River - large river with no blockages in 200 m reach centered on crossing site. Swiftwater makes data collection for Nav waters unsafe.	100-567134-374775-948201
	TL-1021	Transmission Line	Tahultzu Ck.	n/a	390749 E 5970935 N	Aerial Cable	n/a	-	6.5	0.6	2	ns	1	Yes	No	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-610692-671007-505659-146920
	TL-1024	Transmission Line	Unnamed Ck.	n/a	388040 E 5973563 N	Aerial Cable	n/a	-	2.09	0.33	0.5	ns	ns	Yes	Secondary	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-610692-671007-505659-146920
	TL-1025	Transmission Line	Fifteen Ck.	n/a	387563 E 5974040 N	Aerial Cable	n/a	-	3	0.47	2.5	ns	39	Yes	Secondary	Abundant blowdown across banks, navigation would be extrememly limited.	100-567134-610692-671007-505659
	TL-1026	Transmission Line	Unnamed Ck.	n/a	387073 E 5975092 N	Aerial Cable	n/a	-	1.32	0.47	5.5	ns	ns	No	Secondary	Small stream with frequent blowdown across channel. 360 m from lake.	100-567134-610692-522527-428073
	TL-1029	Transmission Line	Smith Ck.	n/a	386473 E 5976842 N	Aerial Cable	n/a	-	3.4	0.6	4.5	1.18	28	No	No	No evidence of past use. Some shallow bars but navigable with small craft.	100-567134-610692-480511
	TL-1030	Transmission Line	Unnamed Ck.	n/a	386285 E 5978055 N	Aerial Cable	n/a	-	1.7	0.2	1.5	ns	ns	No	Initial	Fish bearing S3. 560 m from lake - not minor works	100-567134-610692-522107-063231
	TL-1036	Transmission Line	Unnamed Ck.	n/a	383813 E 5983240 N	Aerial Cable	n/a	-	1.27	0.47	1.5	ns	ns	No	Secondary	Small, low discharge stream that a canoe would not fit into. 870 m from small lake.	100-567134-610692-522107-063231-638299
	TL-1042	Transmission Line	Unnamed Ck.	n/a	380453 E 5985380 N	Aerial Cable	n/a	-	1.48	0.53	3.5	ns	ns	No	Secondary	Large woody debris jams and shallow sections with exposed subtrate impede navigability.	100-567134-581072
	TL-1043	Transmission Line	Unnamed Ck.	n/a	379624 E 5985810 N	Aerial Cable	n/a	-	1.15	0.4	5	ns	ns	No	Initial	Small dewatered stream.	100-567134-581072-492383
	TL-1046	Transmission Line	Unnamed Ck.	n/a	378903 E 5985641 N	Aerial Cable	n/a	-	1.97	0.87	6	ns	ns	No	Secondary	Numerous beaver dams with shallow sections between. More than 1000 m to lake from this TL site so minor works.	100-567134-581072
	TL-1050	Transmission Line	Unnamed Ck.	n/a	376524 E 5985138 N	Aerial Cable	n/a	-	0.88	0.37	7.5	ns	ns	No	Initial	S3 stream with frequent blockages. >1000 m from lake. Beaver dam U/S of crossing site.	100-567134-581072-295086
	TL-1052	Transmission Line	Unnamed Ck.	n/a	370180 E 5990459 N	Aerial Cable	n/a	-	1.02	0.43	9	ns	ns	No	Initial	S6 with gradient barrier assessed in 2002 by DWB.	100-567134-581072-246180-131694
	TL-1057	Transmission Line	Unnamed Ck.	n/a	382716 E 5908851 N	Aerial Cable	n/a	-	3.9	0.77	1.5	1.09	4	No	No	Small stream that a canoe would not fit into.	100-567134-581072-246180-131694-085866
	TL-1058	Transmission Line	Unnamed Ck.	n/a	383308 E 5909163 N	Aerial Cable	n/a	-	3.3	0.37	1	1.14	4	No	No	LWD and boulder obstacles. TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-509773-253156-253259
	TL-1059	Transmission Line	Unnamed Ck.	n/a	388913 E 5942791 N	Aerial Cable	n/a	-	2.33	0.64	2.5	ns	ns	No	No	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-509773-253156-365872-219236

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	TL-1063	Transmission Line	Unnamed Ck.	n/a	397148 E 5960394 N	Aerial Cable	n/a	-	0.79	0.4	3.5	ns	ns	No	Initial	Small, shallow stream.	100-567134-472392
	TL-1064	Transmission Line	Greer Ck.	n/a	396245 E 5962001 N	Aerial Cable	n/a	-	12.52	1.3	2.5	ns	ns	No	No	Small, shallow stream.	100-567134-472392-137966
	TL-1065	Transmission Line	Nechako R.	n/a	394094 E 5962069 N	Aerial Cable	n/a	-	>3	ns	ns	ns	ns	Yes	No	Small, shallow stream that a canoe would not fit into. Small lake 750 m U/S from crossing site.	100-567134-468495
	TL-1066	Transmission Line	Unnamed Ck.	n/a	393456 E 5962121 N	Aerial Cable	n/a	-	0.67	0.37	6.5	ns	ns	No	Initial	Small, shallow stream that a canoe would not fit into. >1000 m from a lake.	100-567134-468495-454918
	TL-1067	Transmission Line	Unnamed Ck.	n/a	393189 E 5962178 N	Aerial Cable	n/a	-	0.67	0.37	6.5	ns	ns	No	Initial	S2 stream that is navigable, within 1000 m from Tahultzu Lake	100-567134-433409
	TL-1077	Transmission Line	Unnamed Ck.	n/a	368859 E 5992869 N	Aerial Cable	n/a	-	1.8	0.72	3	ns	ns	No	No	Shallow stream with multiple blockages observed (total blockages not tallied - Mean BfD makes site minor waters). 370 m U/S from small lake.	100-567134-408281-229646-609745
	TL-1078	Transmission Line	Chedakuz Ck.	n/a	383923 E 5909432 N	Aerial Cable	n/a	-	12.1	0.93	3	1.1	0	No	No	Stream has numerous blockages that would impede navigation. <1000 m from a lake.	100-567134-408281-229646
	TL-1081	Transmission Line	Unnamed Ck.	n/a	386128 E 5909498 N	Aerial Cable	n/a	-	0.6	0.2	4.5	ns	ns	No	Initial	Shallow stream. >1000 m from any lake.	100-567134-408281-229646-553111
	TL-112	Transmission Line	Unnamed Ck.	n/a	376172 E 5985287 N	Aerial Cable	n/a	-	1.7	0.53	5	ns	ns	No	Secondary	Significant amount of LWD causing blockages throughout surveyed reach.	100-567134-408281
	TL-121	Transmission Line	Unnamed Ck.	n/a	371105 E 5989335 N	Aerial Cable	n/a	-	1	1	26	ns	ns	No	Initial	Shallow stream in which a canoe could be paddled.	100-567134-408281-655084
	TL-917	Transmission Line	Unnamed Ck.	n/a	387970 E 5909923 N	Aerial Cable	n/a	-	2.6	0.55	2.5	1.27	5	No	Secondary	Shallow stream with occasional LWD spanning across. >1000 m from a lake.	100-567134-374775-709017-097750-655255-194565
	TL-937	Transmission Line	Stellako R.	n/a	371321 E 5989026 N	Aerial Cable	n/a	-	>3	ns	ns	ns	ns	Yes	No	Stream has numerous SWD blockages.	100-567134-374775-709017-097750-388019
	TL-951	Transmission Line	Unnamed Ck.	n/a	378341 E 5895698 N	Aerial Cable	n/a	-	1.7	0.62	1	ns	ns	No	No	Small stream that a canoe would not fit into.	100-567134-374775-709017-460089-583143
	TL-951	Transmission Line	Unnamed Ck.	n/a	378320 E 5895665 N	Aerial Cable	n/a	-	1.7	0.62	1	ns	ns	No	No	Small stream with multiple SWD jams	100-567134-374775-709017-460089
	TL-952	Transmission Line	Unnamed Ck.	n/a	378494 E 5896661 N	Aerial Cable	n/a	-	1.6	0.45	3.8	1.05	3	No	Secondary	Small stream that a canoe would not fit into.	100-567134-374775-709017-745099-137615
	TL-955	Transmission Line	Unnamed Ck.	n/a	379135 E 5901580 N	Aerial Cable	n/a	-	1.2	0.33	6.3	1.12	3	Yes	Secondary	Small, dry channel. >1000 m from lake - minor works	100-567134-374775-948201-067903
	TL-958	Transmission Line	Unnamed Ck.	n/a	379037 E 5906127 N	Aerial Cable	n/a	-	3.2	0.76	1.5	1.64	0	No	No	Thick growth of willow in channel. Site is ~440 m U/S of an existing road crossing (AE001).	100-567134-610692-480511

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	TL-961	Transmission Line	Unnamed Ck.	n/a	389758 E 5912997 N	Aerial Cable	n/a	-	1.95	0.43	2.5	ns	ns	Yes	Secondary	Grass and sedge in channel would make navigation difficult. Site is ~470 m U/S of an existing road crossing (AE002)	100-567134-610692-480511
	TL-962	Transmission Line	Unnamed Ck.	n/a	390329 E 5913918 N	Aerial Cable	n/a	-	0.95	0.4	6.5	ns	ns	Yes	Initial	TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-509773-339107
	TL-969	Transmission Line	Big Bend Ck.	n/a	397906 E 5927089 N	Aerial Cable	n/a	-	7.5	0.5	2.5	ns	9	No	No	Small, shallow stream that a canoe could not fit into.	100-567134-483452-137086
	TL-970	Transmission Line	Unnamed Ck.	n/a	395992 E 5930875 N	Aerial Cable	n/a	-	1.1	0.45	2	ns	ns	Yes	Initial	S2 stream with good flows. Several shallow sections (0.15 m) could impede navigation.	100-567134-483452
	TL-973	Transmission Line	Big Bend Ck.	n/a	393887 E 5933122 N	Aerial Cable	n/a	-	5.7	0.78	1.5	1.7	12	No	No	Nechako River - large river with no blockages in 200 m reach centered on crossing site. Visual estimation of Mean_BfW > 15 m. Swiftwater makes data collection for Nav waters unsafe.	100-567134
	TL-975	Transmission Line	Unnamed Ck.	n/a	393243 E 5934743 N	Aerial Cable	n/a	-	2.82	0.6	2	ns	8	No	Secondary	Very small stream which would not fit a canoe.	100-567134-476950
	TL-977	Transmission Line	Unnamed Ck.	n/a	391072 E 5937188 N	Aerial Cable	n/a	-	1.12	0.37	12.5	ns	ns	No	Initial	Very small stream which would not fit a canoe.	100-567134-476950-320651
	TL-980	Transmission Line	Unnamed Ck.	n/a	390160 E 5937755 N	Aerial Cable	n/a	-	0.81	0.27	2.5	ns	ns	No	Initial	Stream runs through gulley. TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-374775-948201-023010-073769
	TL-985	Transmission Line	Unnamed Ck.	n/a	393221 E 5948783 N	Aerial Cable	n/a	-	1.53	0.54	3.3	ns	ns	No	Secondary	Frequent mid channel bars and low water levels. Site is ~30 m U/S of existing road crossing. Bridge clearance is 3.1m.	100-567134-610692
	TL-992	Transmission Line	Unnamed Ck.	n/a	394812 E 5953129 N	Aerial Cable	n/a	-	1.2	0.37	1.5	ns	ns	No	Secondary	Impassible wetland downstream. Site is 50 m U/S of existing road crossing (AE-006).	100-567134-610692-520894
	MR-002	Mills Ranch Transmission Line Re-route	Unnamed Ck.	n/a	380214 E 5910902 N	Aerial Cable	n/a	-	12	0.7	3	ns	0	No	No	S2 stream with good flows. Navigation is not impeded by anything. No evidence of recreational use.	100-567134-610692
	MR-003	Mills Ranch Transmission Line Re-route	Unnamed Ck.	n/a	380847 E 5911485 N	Aerial Cable	n/a	-	0.6	0.37	1.5	ns	ns	No	Initial	Small stream that a canoe would not fit into.	100-567134-610692-432738
	MR-004	Mills Ranch Transmission Line Re-route	Unnamed Ck.	n/a	383344 E 5911565 N	Aerial Cable	n/a	-	0.84	0.4	2.5	ns	ns	No	Initial	Intermittant small, shallow channel. >1000 m from lake - minor works	100-567134-610692-460788
	MR-010	Mills Ranch Transmission Line Re-route	Unnamed Ck.	n/a	387848 E 5913537 N	Aerial Cable	n/a	-	2.38	0.53	1.5	ns	8	No	Secondary	S3 stream with frequent blockages	100-567134-610692-522107-063231-351992

New ID	Old Site ID	Project Component	Waterbody	Reach	UTM	Type of Work	Type of Interaction	Impacted Stream Length (m)	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[1]	Exempt as Minor Works	Exempt as Minor Waters	Navigability Comments	Watershed Code
	SR-003	Stellako Transmission Line Re-route	Stellako R.	n/a	371520 E 5990351 N	Aerial Cable	n/a	-	>3	ns	ns	ns	ns	Yes	No	Stellako River - large river with no blockages in 200 m reach centered on crossing site. Swiftwater makes data collection for Nav waters unsafe.	100-567134-374775-948201
	SR-004	Stellako Transmission Line Re-route	Unnamed Ck.	n/a	371311 E 5990541 N	Aerial Cable	n/a	-	1.02	0.43	9	ns	ns	No	Initial	Small, dry channel. >1000 m from lake - minor works	100-567134-374775-948201-067903
	SR-009	Stellako Transmission Line Re-route	Unnamed Ck.	n/a	369044 E 5993214 N	Aerial Cable	n/a	-	1.8	0.72	3	ns	ns	No	No	Stream runs through gulley. TL crossing only at this site. More than 1000 m from lake - minor works.	100-567134-374775-948201-023010-073769

***Note**: D/S - downstream; m - metre; Mean BfD - mean bankfull depth; Mean BfW - mean bankfull width; No. - number; NCD - no continuous drainage; NVC - no visible channel; ns - not sampled; % - percent; Trib - tributary; TSF - tailings storage facility; U/S - upstream; UTM - Universal Transverse Mercator*

[1] Blockages are natural obstructions such as log jams, but does not include large woody debris, which may also affect navigability

[2] A pool approximately 0.9 m deep and 155 m in length, created as a result of a beaver dam was not included in the stream reach width and depth calculations as it was not considered representative.

meets initial review criteria for minor waters

meets seconday review criteria for minor waters

excluded as minor works or waters

non-minor

Table 2. Blackwater Project Field Sample Sites Revealing No Visible Channel (NVC) or Otherwise Observed to Not be Streams - Off-site

Site No.	Site ID	Project Component	Survey Year	UTM Location for Site	Watershed Code	Navigability
109	AE-915	AE	2013	394969 E 5911785 N	100-567134-610692-522107-445492	NVC; No water; no distinct channel; drainage thick with alder.
1	AP-001	AP	2012	376179 E 5895044 N	100-567134-610692-671007-505659	Not a stream; Dry and vegetated draw down hillside. No sign of water or scoured channel.
4	AP-006	AP	2012	378832 E 5905763 N	100-567134-610692-480511-367135	Not a stream; No channel, scouring, water, or alluvial deposits.
6	AP-901	AP	2012	378853 E 5901829 N	NWC	Not a stream; Depressed area at edge of cutblock. No scoured channel.
7	AP-902	AP	2012	379035 E 5902785 N	NWC	Not a stream; Slight depression in mature forest with mossy bed. No scoured channel.
8	AP-903	AP	2012	379109 E 5903177 N	NWC	Not a stream; Dry and mossy drainage entering cutblock. No sign of scour or recent flow.
1	MR-001	MR	2013	379939 E 5908923 N	100-567134-610692-425776	Not a stream; Slight depression in yound pine forest. Some evidence of spring runoff. No scoured channel. No alluvial deposits.
5	MR-005	MR	2013	385670 E 5911564 N	100-567134-610692-494661-749864	Not a stream; Not visited. Assume prev. classification.
6	MR-006	MR	2013	386694 E 5911563 N	100-567134-610692-522107-063231-347436-792948-497293	Not a stream; Dry, vegetated upland area between two small wetlands. No scoured channel, no alluvial deposits, no evidence of ephemeral runoff.
7	MR-007	MR	2013	386771 E 5911698 N	100-567134-610692-522107-063231-347436-792948	Not a stream; Wetland with lots of segdes. ~10cm of standing water throughout, but no scoured channel or alluvial deposits. Not a stream.
8	MR-008	MR	2013	386888 E 5911964 N	100-567134-610692-522107-063231-347436-446973	Not a stream; Open sedge wetland with pockets of open water. One area (5mx5m) water >1m in depth. No scoured channel or alluvial deposits. Not a stream.
9	MR-009	MR	2013	386974 E 5912157 N	100-567134-610692-522107-063231-351992-030554	Not a stream; Small wetland with open water. No scoured channel or alluvial deposits. Not a stream.
1	SR-001	SR	2013	371789 E 5987851 N	100-567134-374775-948201-095055	Not a stream; A few patches of willow is only indicator of moisture at this site.
2	SR-002	SR	2013	371679 E 5990092 N	100-567134-374775-948201-072981	Not a stream; No evidence of any kind of drainage. No scoured channel, no alluvial deposits, no water. Not a stream.
5	SR-005	SR	2013	370395 E 5991372 N	100-567134-374775-948201-023010-036907-483445	Not a stream; Drainage appears ephemeral, with evidence of seasonal pooling. No socured channel, no alluvial deposits. Not a stream.
6	SR-006	SR	2013	370120 E 5991621 N	100-567134-374775-948201-023010-036907	Not a stream; Dry, vegetated depression. No scoured channel, no alluvial deposits, no water.
7	SR-007	SR	2013	369186 E 5992149 N	100-567134-374775-948201-023010-036907-351538	Not a stream; Shallow gully at bottom of hillsope. Dry and vegetated with no channel.
8	SR-008	SR	2013	369053 E 5992304 N	100-567134-374775-948201-023010-036907-351538-682690	Not a stream; Dry and vegetated drainage in strip of aspen. No scouring or deposits. Not a stream. Same reach as TL-128.
1	TL-003	TL	2012	378678 E 5896989 N	100-567134-610692-671007-505659-348488	Not a stream; Nothing at UTM to indicate a drainage. Suspect water drains out wetland above to the north.
4	TL-024	TL	2012	395974 E 5920952 N	100-567134-581072-851257-223363	Not a stream; Black spruce wetland. No channel or connectivity to Esker Creek.
7	TL-029	TL	2012	398372 E 5924767 N	100-500560-248839-952068-064975-202289-304738	Not a stream; Checked d/s at AE-025. Some scouring, but none over 10m. Mostly saturated soil with moss and horsetail.
8	TL-030	TL	2012	398378 E 5924863 N	100-500560-248839-952068-064975-202289-304738-348773	Not a stream; Checked d/s at AE-025. Some scouring, but none over 10m. Mostly saturated soil with moss and horsetail.
9	TL-031	TL	2012	398387 E 5924995 N	100-500560-248839-952068-064975-202289	Not a stream; No water or channel. Classed d/s at AE-026 (same reach).
10	TL-032	TL	2012	398437 E 5925770 N	100-500560-248839-952068	Not a stream; Pooled water with no continuous channel. Classed d/s at AE-027(same reach).
11	TL-036	TL	2012	397492 E 5928388 N	100-567134-581072-558749-382606-020991	Not a stream; Moisture loving plants, but no open water, channel, or culvert at crossing. Assessed d/s at AE-032 (same reach).
12	TL-037	TL	2012	397462 E 5928456 N	100-567134-581072-558749	Not a stream; A few aspen, but otherwise no evidence of a waterway. No culvert at crossing. Assessed d/s at AE-033 (same reach).
13	TL-038	TL	2012	396527 E 5930101 N	100-567134-581072-548781	Not a stream; Some evidence of flow upstream of road, but no scoured channel or culvert at crossing. Assessed d/s at AE-034 (same reach).
14	TL-044	TL	2012	389457 E 5938275 N	100-567134-581072-246180-266430-225232	Not a stream; Some scouring and deposits, but no sections greater than 10m. No water and limited connectivity between scoured sections. Not a stream.
15	TL-045	TL	2012	389360 E 5938381 N	100-567134-581072-246180-266430	Not a stream; No scouring, deposits, or water.
16	TL-046	TL	2012	388866 E 5938922 N	100-567134-581072-246180-334534	Not a stream; Only indicator of moisture is a few aspen. No drainage at this site.
17	TL-047	TL	2012	388056 E 5939808 N	100-567134-581072-246180	Not a stream; No sign of a watercourse.
19	TL-049	TL	2012	388035 E 5941544 N	100-567134-509773-339107-437144-187893	Not a stream; No scoured channel. Drainage runs through plantation. Willow throughout.
20	TL-051	TL	2012	389873 E 5944049 N	100-567134-509773-339107-396465	Not a stream; No alluvial deposits, some scoured channel, but dry and vegetated throughout.
22	TL-055	TL	2012	393008 E 5947843 N	100-567134-509773-253156-253259-320954	Not a stream; Very saturated ground with sub-surface flow. Some channelization near road, but disappears near the site. Wetland type.
25	TL-116	TL	2013	372591 E 5986603 N	100-567134-374775-948201-102919-234422	Not a stream; No scouring , alluvial deposits, or open water along this swath of alder. Not a stream.
26	TL-117	TL	2013	372152 E 5986764 N	100-567134-374775-948201-102919-206654	Not a stream; Rich vegetation with no scouring, alluvial deposits, or open water. Not a stream.

Site No.	Site ID	Project Component	Survey Year	UTM Location for Site	Watershed Code	Navigability
27	TL-118	TL	2012	371695 E 5987835 N	100-567134-374775-948201-095055	Not a stream; A few patches of willow is only indicator of moisture at this site.
29	TL-127	TL	2012	369148 E 5992126 N	100-567134-374775-948201-023010-036907-351538	Not a stream; Shallow gully at bottom of hillsope. Dry and vegetated with no channel.
30	TL-128	TL	2012	369027 E 5992299 N	100-567134-374775-948201-023010-036907-351538-682690	Not a stream; Dry and vegetated drainage in strip of aspen. No scouring or deposits.
32	TL-918	TL	2012	388919 E 5910348 N	100-567134-610692-522107-202099	Not a stream; Not visited. Assume prev. classification.
33	TL-936	TL	2012	371416 E 5988737 N	100-567134-374775-948201-079597	Not a stream; Dry pockets within willow and alder growth. No scouring or deposits.
35	TL-939	TL	2012	378821 E 5901829 N	NWC	Not a stream; Depression on edge of cutblock. No scouring or other sign of flow.
39	TL-953	TL	2012	378809 E 5898631 N	100-567134-610692-579340-841297	Not a stream; Previous classification. Grassy swale in cutblock with no scouring, alluvial deposits, flow, or channel. Not a stream.
40	TL-954	TL	2012	378946 E 5899491 N	100-567134-610692-579340-841297	Not a stream; Standing water in wetland type in cutblock. Likely sink for runoff. No channel found.
42	TL-957	TL	2012	378904 E 5905716 N	100-567134-610692-480511-367135	Not a stream; No channel, scouring, water, or alluvial deposits.
46	TL-963	TL	2013	395064 E 5919673 N	100-567134-581072-878917	Not a stream; 60m scoured section d/s of existing road crossing down steep section. No scouring or alluvial deposits outside this area. Not a stream.
47	TL-964	TL	2013	395183 E 5919745 N	100-567134-581072-878917	Not a stream; Wetland type with water tolerant vegetation. Pooled water in areas. No scoured channel or alluvial deposits. Not a stream.
48	TL-965	TL	2012	398480 E 5923189 N	100-567134-581072-796569-024088	Not a stream; No channel or any indicator of seasonal drainage. Some mature aspen indicating moist soil.
49	TL-966	TL	2012	398491 E 5924083 N	100-500560-248839-952068-064975-725103	Not a stream; Mossy coniferous area along plantation. No scoured channel.
50	TL-967	TL	2012	398156 E 5926237 N	100-500560-248839-945420	Not a stream; Some channeling and pools of water but not continuous. Classed d/s at AE-028 (same reach).
51	TL-968	TL	2012	398081 E 5926491 N	100-567134-581072-604068	Not a stream; Not visited. Assume previous classification.
54	TL-971	TL	2012	394839 E 5932042 N	100-567134-581072-457721	Not a stream; Dry and vegetated. Gulley upstream of road, but no scoured channel.
55	TL-972	TL	2013	393950 E 5932965 N	100-567134-581072-418953	Not a stream; Dry, vegetated gulley. No scouring, no alluvial deposits, no water. Not a stream.
57	TL-974	TL	2013	393428 E 5934279 N	100-567134-581072-295086-219362	Not a stream; Dense strip of Salix and sedges. Scouring present, but none >100m. Several beaver dams have impounded water. Not a stream.
59	TL-976	TL	2013	392928 E 5935536 N	100-567134-581072-295086-167040	Not a stream; Saturated soils and pooling evident, but no socured channel or alluvial deposits. Not a stream.
61	TL-978	TL	2002	390981 E 5937244 N	100-567134-581072-246180-131694-414454	Not a stream; Classified in 2002. NCD with no lentic origin. Assume previous classification
62	TL-979	TL	2002	390445 E 5937578 N	100-567134-581072-246180-131694-129753	Not a stream; Classified in 2002. NCD with no lentic origin. Assume previous classification
64	TL-982	TL	2012	390770 E 5945330 N	100-567134-509773-569914	Not a stream; Vegetated wet area; no channel or alluvial deposits.
65	TL-983	TL	2013	391512 E 5946058 N	100-567134-509773-527607	Not a stream; No scouring, alluvial deposits, or open water. Mapped watercourse is a strip of alder. Not a stream.
67	TL-986	TL	2013	393469 E 5949975 N	100-567134-509773-253156-253259-178981	Not a stream; No scoured channel or alluvial deposits, but there is evidence of ephemeral pooling. Not a stream.
68	TL-987	TL	2013	393843 E 5950751 N	100-567134-509773-253156-253259-133188	Not a stream; No scouring, alluvial deposits, or water. Open corridor through Spruce stand. Not a stream.
69	TL-988	TL	2013	394145 E 5951379 N	100-567134-509773-253156-253259-095526	Not a stream; Saturated strip among alder and sedges. Discontinuous pooling. No scouring or alluvial deposits. Not a stream.
70	TL-989	TL	2013	394526 E 5952170 N	100-567134-509773-253156	Not a stream;
71	TL-990	TL	2013	394581 E 5952285 N	100-567134-509773-253156-422321	Not a stream; No scouring or alluvial deposits. Discontinuous puddling in small gulley. Not a stream.
72	TL-991	TL	2013	394809 E 5952818 N	100-567134-509773-253156-403239	Not a stream; Wetland dominated by sedges and willow. Discontinuous ponded areas. No scouring or alluvial deposits. Not a stream.
74	TL-993	TL	2013	395023 E 5953965 N	100-567134-509773-253156-365872-383989	Not a stream; No scouring, alluvial deposits, or open water in this shallow depression. Not a stream.
75	TL-994	TL	2013	395054 E 5954071 N	100-567134-509773-253156-365872	Not a stream; No scouring > 20m. Scoured sections fo contain mineral alluvium, but elsewhere is fully vegetated with no channel definition. Not a stream.
76	TL-995	TL	2013	396578 E 5955960 N	100-567134-483452-005364-346411-246527-435740	Not a stream; No scouring >60m. Appears to be a stream at crossing, but there is not enough channel definition to be considered a stream.
77	TL-996	TL	2013	397240 E 5956745 N	100-567134-483452-005364-346411-246527-525824	Not a stream; No scouring, alluvial deposits, or open water. Equisetum spp only indicator of a drainage. Not a stream.
78	TL-1003	TL	2013	392745 E 5962272 N	100-567134-476950-427041	Not a stream; No scouring, no alluvial deposits, no open water. Not a stream.
79	TL-1005	TL	2013	392035 E 5963206 N	100-567134-472392-188458-116997	Not a stream; Wet depression in a drainage. No scouring >3m. No alluvial deposits covering >3m. Not a stream.
82	TL-1008	TL	2013	391096 E 5965651 N	100-567134-470833	Not a stream; Site disturbed by forestry activities, resulting in ponded water. No scouring or alluvial deposits. Not a stream.
83	TL-1009	TL	2013	390975 E 5965964 N	100-567134-468495-243247	Not a stream; Very small, discontinuous scoured sections. Some of the drainage is saturated. Not a stream.
86	TL-1012	TL	2013	390761 E 5967322 N	100-567134-463689-790071	Not a stream; Dry vegetated area. No scouring, alluvial deposits, or water. Not a stream.

Site No.	Site ID	Project Component	Survey Year	UTM Location for Site	Watershed Code	Navigability
87	TL-1013	TL	2013	390764 E 5967504 N	100-567134-463689	Not a stream; No scouring > 3m. No alluvial deposits. Discontinuous saturation and pooling. Not a stream.
88	TL-1014	TL	2013	390768 E 5967661 N	100-567134-463689-784672	Not a stream; No scouring or alluvial deposits. Saturated soil with dense moisture tolerant plant species.
89	TL-1015	TL	2013	390773 E 5967920 N	100-567134-463689-737924	Not a stream; No scouring > 5m. No alluvial deposits. *Lonicera involucrata* dominates.
90	TL-1016	TL	2013	390779 E 5968201 N	100-567134-463689-682532	Not a stream; Discontinuous pooling and moist pockets of soil. No scouring or alluvial deposits. Not a stream.
91	TL-1017	TL	2013	390786 E 5968543 N	100-567134-463689-614435	Not a stream; No scouring or alluvial deposits. Water pooling at culvert on existing road. Water not seen elsewhere in drainage. Not a stream.
92	TL-1018	TL	2013	390797 E 5969105 N	100-567134-463689-540545	Not a stream; No scouring or alluvial deposits. Some water flowing over soil. Not a stream.
93	TL-1019	TL	2013	390804 E 5969428 N	100-567134-463689-536465-348208	Not a stream; Moist soil with some standing water. No scouring or alluvial deposits. Not a stream.
95	TL-1022	TL	2013	389970 E 5971325 N	100-567134-433409-729688	Not a stream; Intermittent 1-2m scoured sections. Saturated soil elsewhere. No alluvial deposits. Not a stream.
96	TL-1023	TL	2013	388774 E 5972830 N	100-567134-408281-229646-609745-254415	Not a stream; No scouring or alluvial deposits. Some standing water. Ground is saturated. Not a stream.
100	TL-1027	TL	2013	386709 E 5976155 N	100-567134-408281-621858	Not a stream; Alder swale through plantation. Some scouring, but infrequent.
101	TL-1028	TL	2013	386514 E 5976723 N	100-567134-408281-698246	Not a stream; Discontinuous scouring and alluvial deposits. Remainder of drainage is vegetated. Not a stream.
104	TL-1031	TL	2013	386687 E 5980338 N	100-567134-374775-709017-097750	Not a stream; No scouring or alluvial deposits. Wet ground with occasional puddles. Not a stream.
105	TL-1034	TL	2013	383954 E 5982493 N	100-567134-374775-709017-097750-655255-205293	Not a stream; No scouring or alluvial deposits. Dry, vegetated ground. Not a stream.
106	TL-1035	TL	2013	383820 E 5983126 N	100-567134-374775-709017-097750-655255	Not a stream; Occasional scouring, no alluvial deposits, no water. Mapped watercourse in shallow gulley. Not a stream.
108	TL-1037	TL	2013	382469 E 5984432 N	100-567134-374775-709017-097750-580521	Not a stream; No scouring, alluvial deposits, or open water. Mature poplar and aspen indicate ground moisture. Not a stream..
109	TL-1040	TL	2013	381005 E 5985094 N	100-567134-374775-709017-097750-388019-413178	Not a stream; No scouring, occasional alluvial deposits. Not a stream.
110	TL-1041	TL	2013	380726 E 5985238 N	100-567134-374775-709017-097750-388019-413178-329245	Not a stream; No scouring, alluvial deposits, or open water. Ground along mapped watercourse is moist. Not a stream.
114	TL-1047	TL	2013	378056 E 5985356 N	100-567134-374775-709017-460089-547927	Not a stream; No scouring >5m, some alluvial deposits in scoured sections. Low flows. Not a stream.
115	TL-1048	TL	2013	377635 E 5985292 N	100-567134-374775-709017-700524	Not a stream; No scouring, alluvial deposits, or water. Not a stream.
116	TL-1049	TL	2013	376597 E 5985148 N	100-567134-374775-709017-745099	Not a stream; No scouring, trace alluvial deposits, small discharge of water. Alluvial deposits found in isolated pools. Not a stream.
119	TL-1053	TL	2013	370145 E 5990507 N	100-567134-374775-948201-067903-290144	Not a stream; Dry, vegetated strip of moisture tolerant vegetation. No scouring, alluvial deposits, or water. Not a stream.
120	TL-1054	TL	2013	369786 E 5990993 N	100-567134-374775-948201-023010-036907-483445	Not a stream; Scattered scouring, but no continuous channel. Site is at end of mature alder swale.
121	TL-1055	TL	2013	369550 E 5991314 N	100-567134-374775-948201-023010-036907	Not a stream; 50m scoured channel and evidence of spring run off. May be because of 5% gradient. Not enough to be a stram.
122	TL-1056	TL	2013	369370 E 5991557 N	100-567134-374775-948201-023010-036907-554634	Not a stream; Slight depression with some evidence of meltwater runoff, but no scoured channel or alluvial deposits.
126	TL-1060	TL	2013	390485 E 5944941 N	100-567134-509773-339107-396465-585074	Not a stream; Saturated strip among alder and sedges. Discontinuous pooling. No scouring or alluvial deposits. Not a stream.
127	TL-1061	TL	2013	391095 E 5945775 N	100-567134-509773-527607	Not a stream; No scouring, alluvial deposits, or open water. Mapped watercourse is a strip of alder. Not a stream.
128	TL-1062	TL	2013	397380 E 5959982 N	100-567134-483452-137086-384243	Not a stream; No scouring or alluvial deposits. Wet drainage area. Not a stream.
134	TL-1068	TL	2013	393165 E 5962183 N	100-567134-476950	Not a stream; No scouring, no alluvial deposits, no water. Moss and alder found along mapped watercourse. Not a stream.
135	TL-1069	TL	2013	392356 E 5962371 N	100-567134-476950	Not a stream; No scouring, no alluvial deposits, no water. Mosses found along mapped watercourse. Not a stream.
136	TL-1070	TL	2013	392328 E 5962444 N	100-567134-476950-738478	Not a stream; No scouring or alluvial deposits in wetland type with lots of alder. Some standing water. Not a stream
137	TL-1071	TL	2013	392281 E 5962567 N	100-567134-476950-738478	Not a stream; No scouring, alluvial deposits, or water. Not a stream.
138	TL-1072	TL	2013	389066 E 5972539 N	100-567134-433409-462023-675778	Not a stream; Medium sized black spruce/sedge wetland. Currently dry, but soils are saturated.No scoured channel or alluvial deposits.
139	TL-1073	TL	2013	387460 E 5974143 N	100-567134-408281-229646-640959	Not a stream; No scouring, alluvial deposits, or water. Several dry depressions. Moisture tolerant vegetation present. Not a stream.
140	TL-1074	TL	2013	385841 E 5981225 N	100-567134-374775-709017-097750	Not a stream; Alignment crosses 60m wetland section with no scouring or alluvial deposits. No open water or channel. Not a stream.
141	TL-1075	TL	2013	384353 E 5982225 N	100-567134-374775-709017-097750-727689	Not a stream; No scouring, alluvial deposits, or water. Mapped watercourse runs through mapped gulley. Not a stream
142	TL-1076	TL	2012	374678 E 5985779 N	100-567134-374775-709017-341978	Not a stream; Evidence of snowmelt runoff, but no continuous channel or alluvial deposits.
145	TL-1079	TL	2002	384154 E 5909448 N	100-567134-610692-494661	Not a stream; Not visited. Assume prev. classification.
146	TL-1080	TL	2012	385639 E 5909486 N	100-567134-610692-513545	Not a stream; Some ponded water at culvert, but no scoured channel.
148	TL-1082	TL	2012	379002 E 5902757 N	NWC	Not a stream; Slight depression in mature forest with mossy bed. No scoured channel.
149	TL-1083	TL	2012	379058 E 5903128 N	NWC	Not a stream; Dry and mossy drainage entering cutblock. No sign of scour or recent flow.

Site No.	Site ID	Project Component	Survey Year	UTM Location for Site	Watershed Code	Navigability
1	AA-001	AA	2013	375092 E 5903417 N	NWC	Not a stream; Dry, vegetated strip of timber b/w 2 plantations. No scouring, alluvial deposits, or water. Not a stream.
3	AA-003	AA	2013	375858 E 5903350 N	100-567134-610692-480511-392467	Not a stream; No scoured channel or alluvial deposits. Occasional small wet areas along mapped watercourse. Not a stream.
4	FSS-004	FSS	2013	381098 E 5902347 N	100-567134-610692-522527-314089-438165	Not a stream; channel non-existant and dry; water in culvert for approx. 10 m U/S and D/S, dry everywhere else

Project Component	*Baseline Crew*
Mine Site	*AMEC*
AE - Existing Access Road	*AVISON*
AP - Mine Site Access Road	*AVISON*
TL - Transmission Line	*AVISON*
MR - Mills Ranch Transmission Line Re-route	*AVISON*
SR - Stellako Transmission Line Re-route	*AVISON*
FSS - Freshwater Supply System	*AMEC*
AA - Airstrip Access Road	*AVISON*

Table 3. Blackwater Project Field Sample Sites Revealing No Visible Channel (NVC) or Otherwise Observed to Not be Streams - On-site

No.	Watershed Code	UTM Location for Site or Reach Start Point	Waterbody	Location
3	100-567134-610692-522527-758727	375529 E 5896543 N	Trib to Davidson Creek	Under TSF
8	100-567134-610692-522527-688328-175057	374715 E 5897936 N	Trib to Creek 688328	Under TSF
16	100-567134-610692-671007-505659-146920	379728 E 5897746 N	Creek 146920 (Reach 4 & 5)	Under East stockpile and open pit
21	100-567134-610692-522527-616152	377741 E 5898604 N	Small trib to Davidson Creek	Under spillway
53	100-567134-610692-671007-505659-348488	378678 E 5896989 N	Creek 348488	Crossed by proposed mine access road and transmission line and pipeline
57	100-567134-610692-671007-505662	382643 E 5898525 N	Creek 505659 (reach 4)	D/S of TSF

Appendix B

Blackwater Project: Maps and Engineering Diagrams

ERM

Appendix B. Blackwater Project: Maps and Engineering Diagrams

The figures in this report illustrate the plan and cross-section engineering diagrams and maps of works identified in the Blackwater Project Navigable Waters Baseline Report and Technical Assessment as requiring applications for approval from Transport Canada under Section 5 of the *Navigable Waters Protection Act* (1985).

Tables 1 to 5 below a list of the maps and engineering diagrams provided in this appendix; images appear in the same order in the appendix as they do in the tables. Table 1 also provides a key linking between the locations and IDs for works used in the main report and the engineering drawings of works for the Blackwater Project in this appendix.

Table 1. Blackwater Project Aerial Cable and Bridge Engineering Drawings

Work	ID	Water	Figure
Aerial Cable	TL-1065	Nechako R.	Dwg. Nos.: • Power Line Access Typical Sections Class B4, Dwg. No.: 13PG0040-500-1920-004 • Power Line Access Typical Sections Class C4, Dwg. No.: 13PG0040-500-1920-003
Aerial Cable	TL-937	Stellako R.	
Aerial Cable *(Alternative)*	SR-003	Stellako R.	
MAR Bridge	AP-007	Turtle Ck.	Turtle Creek Crossing #1 • Site Plan, Profiles, Sections and Notes, Dwg. No.: 13PG0040-100-1960-101 • General Arrangement, Dwg. No.: 13PG0040-100-1960-102
MAR Bridge	AP-005	Unnamed Ck. (Davdison Ck. Tributary)	Turtle Creek Crossing #2 • Site Plan, Profiles, Sections and Notes, Dwg. No.: 13PG0040-100-1960-201 • General Arrangement, Dwg. No.: 13PG0040-100-1960-202
MAR Bridge	AP-004	Davidson Ck.	Turtle Creek Crossing #3 • Site Plan, Profiles, Sections and Notes, Dwg. No.: 13PG0040-100-1960-301 • General Arrangement, Dwg. No.: 13PG0040-100-1960-302
MAR Bridge	AP-905	Unnamed Ck.	Turtle Creek Crossing #4 • Site Plan, Profiles, Sections and Notes, Dwg. No.: 13PG0040-100-1960-401 • General Arrangement, Dwg. No.: 13PG0040-100-1960-402

Table 2. Blackwater Project Maps of Project Phase Development

Map Topic	Map Description	Map Identification
Mine Site Development over Project Phases	Plan view of Blackwater Gold Project mine site with components for different years representing construction, operation, and closure / post-closure phases	Dwg. Nos.: • Project Area General Arrangement, Figure 1 • General Arrangement End of Year -2 Plan, Figure 3 • General Arrangement End of Year -1 Plan, Figure 4 • General Arrangement End of Year 1 Plan, Figure 5 • General Arrangement End of Year 8 Plan, Figure 6 • General Arrangement End of Year 17 Plan, Figure 2 • General Arrangement Post Closure Plan, Figure 7

Table 3. Blackwater Project Tailing Storage Facility (TSF) and Environmental Control Dam

Map Topic	Map Description	Map Identification
Environmental Control Dam	Freshwater supply system freshwater reservoir plan view and cross section of dam	Dwg. No.: • Environmental Control Dam Plan and Section
TSF	TSF Site C Main dam and west (Saddle) dam typical sections	Dwg. No.: • TSF Site C Main Dam and West Dam Sections , D0115
TSF	TSF Site C Year -2 construction plan with plan view and cross section of Site C main dam	Dwg. No.: • TSF Site C Year -2 Construction Plan, D0140
TSF	TSF Site C Year -1 construction plan with plan view cross section of Site C main dam	Dwg. No.: • TSF Site C Year -1 Construction Plan, D0150
TSF	TSF Site C Year -1 construction plan with plan view cross section of Site D main dam	Dwg. No.: • TSF Site D Year -1 Construction Plan, D00170

(Source: Knight Piesold. 2013. Mine Waste and Water Management Design Report. Prepared for New Gold by Knight Piesold Consulting. December 4, 2013. VA101-457/6-11 Rev 0.)

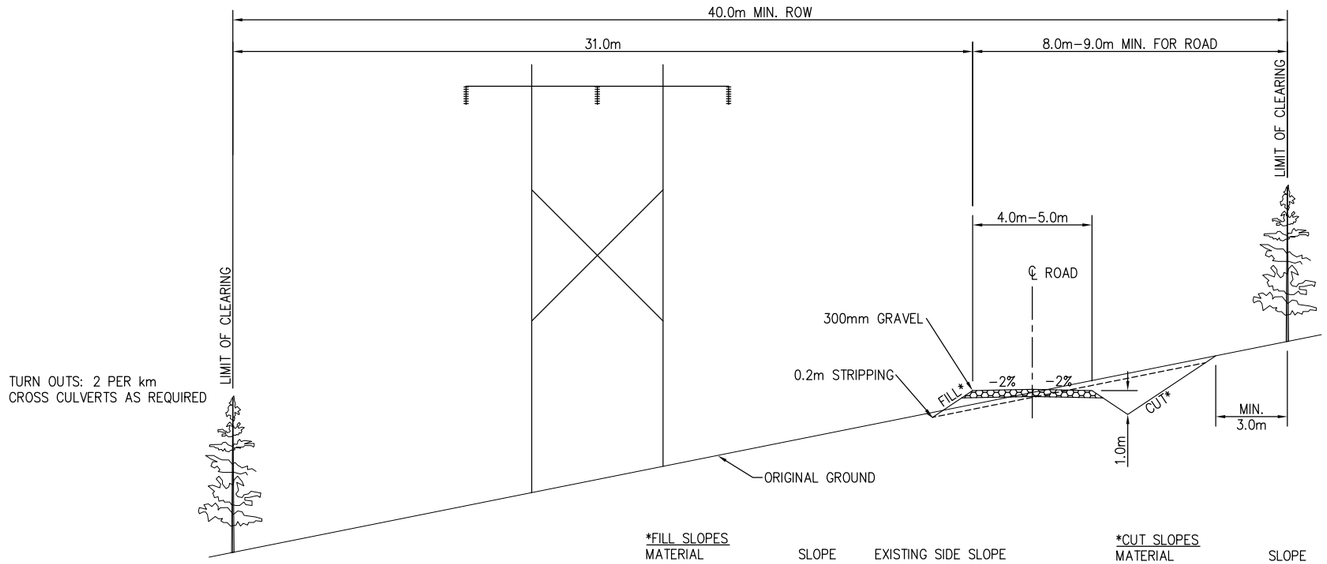
Table 4. Blackwater Project Freshwater Supply System

Component	Description	Image Identification
Freshwater Supply System	Plan view of freshwater supply pipeline with details on road work locations	Dwg. No.: • Blackwater Project Proposed Water Supply Pipeline (Allnorth)
Freshwater Supply System	Pipeline general arrangement and profile.	Dwg. No.: • Freshwater Supply Pipeline General Arrangement and Profile D0200
Freshwater Supply System	Freshwater supply system intake structure in Tatelkuz Lake: plan and section	Dwg. No.: • Intake Structure Plan and Section
Freshwater Supply System	Freshwater supply system freshwater reservoir plan view and cross section of dam	Dwg. No.: • Freshwater Reservoir Plan and Section

(Source: Knight Piesold. 2013. Mine Waste and Water Management Design Report. Prepared for New Gold by Knight Piesold Consulting. December 4, 2013. VA101-457/6-11 Rev 0.)

Table 5. Blackwater Project Fish Habitat Compensation

Component	Description	Image Identification
Fish Habitat Compensation	Plan view of fish habitat compensation works in upper reaches of Davidson Creek and Creek 705 showing: • Coffer dam (Lake Dam) west of the Site 'C' saddle (west) dam • Davidson reach 11 and 12 (Lake 01682LNRS) flooding to make "New Lake Area" • Diversion channel connecting Lake 01682LNRS to Lake 01538EUET (Creek 705), showing flow changes	Dwg. No.: • Lake 01682LNRS Diversion and Enlargement Plan, VE52277



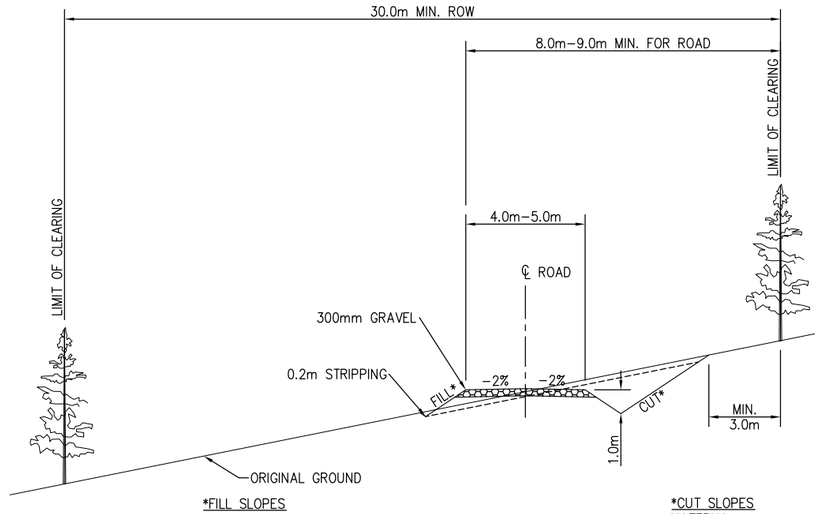
*FILL SLOPES

MATERIAL	SLOPE	EXISTING SIDE SLOPE
LARGE GRANULAR	0.5:1	30%–40%
ROCK	0.5:1	30%–40%
FINES	2:1	20%–30%
GRANULAR	1.5:1	20%–30%

*CUT SLOPES

MATERIAL	SLOPE	EXISTING SIDE SLOPE
LARGE GRANULAR	0.5:1	30%–40%
ROCK	0.5:1	30%–40%
FINES	2:1	20%–30%
GRANULAR	1.5:1	20%–30%

TYPICAL ROAD SEASONAL (B4)
SCALE: 1:250



*FILL SLOPES

MATERIAL	SLOPE	EXISTING SIDE SLOPE
LARGE GRANULAR	0.5:1	30%–40%
ROCK	0.5:1	30%–40%
FINES	2:1	20%–30%
GRANULAR	1.5:1	20%–30%

*CUT SLOPES

MATERIAL	SLOPE	EXISTING SIDE SLOPE
LARGE GRANULAR	0.5:1	30%–40%
ROCK	0.5:1	30%–40%
FINES	2:1	20%–30%
GRANULAR	1.5:1	20%–30%

TYPICAL ROAD SEASONAL (B4)
SCALE: 1:250

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/29	ISSUED FOR REVIEW	AJB	FMF

CLIENT: newgold

Allnorth

CLIENT NO:	-	DRWN:	AJB	DATE: 13/08/29
PROJECT NO:	13PG0040	DSGN:	AJB	DATE: 13/07/11
DRAWING SIZE:	11X17	CHKD:	FMF	DATE: -
SCALE:	1:250	APVD:	FMF	DATE: -

PROJECT:

BLACKWATER PROJECT

TITLE:

POWER LINE ACCESS TYPICAL SECTIONS CLASS B4 ASSUMING NEW CONSTRUCTION

DWG NO: **13PG0040-500-1920-004**

REV: **0**

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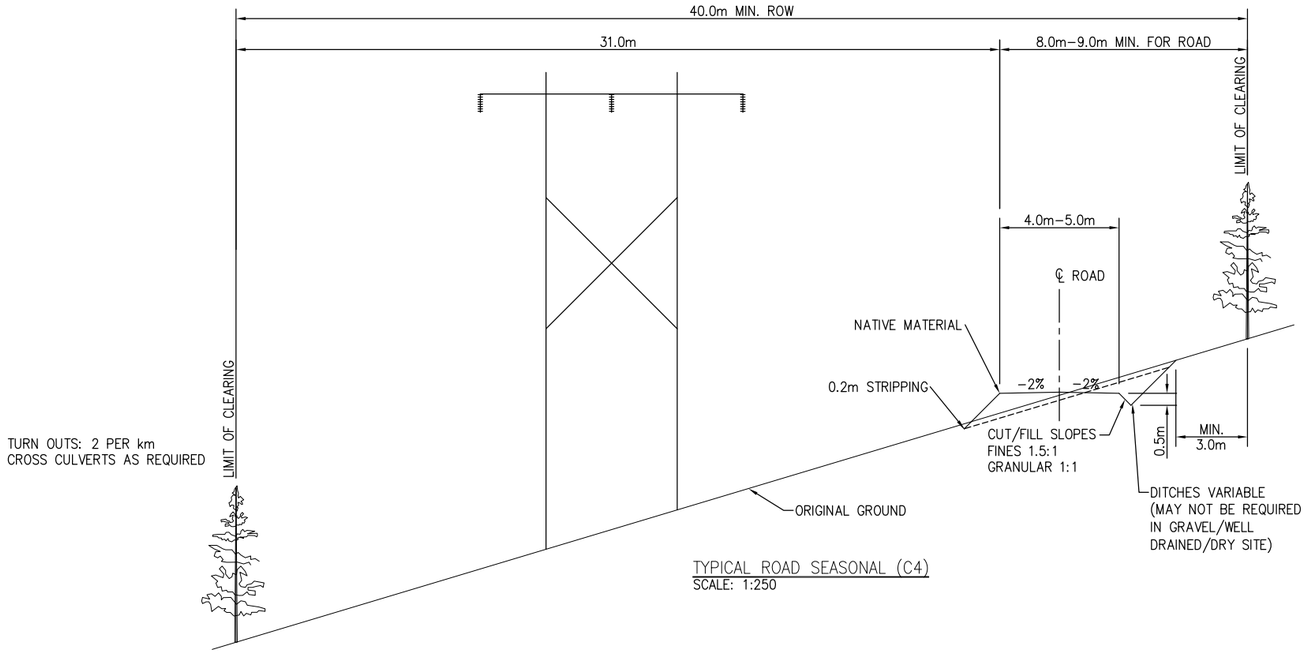
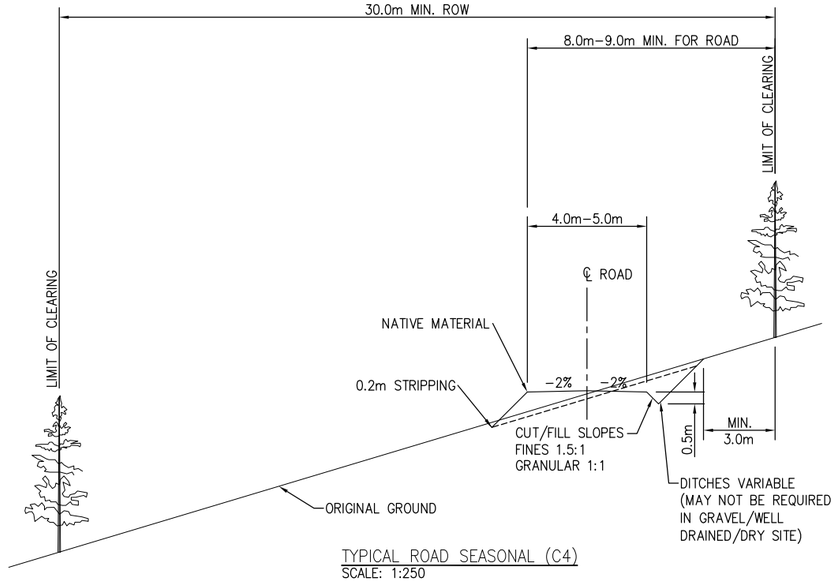


TYPICAL ROAD SEASONAL (C4)
SCALE: 1:250



TYPICAL ROAD SEASONAL (C4)
SCALE: 1:250

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
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CLIENT: newgold

Allnorth

CLIENT NO:	-	DRWN:	AJB	DATE:	13/08/29
PROJECT NO:	13PG0040	DSGN:	AJB	DATE:	13/07/11
DRAWING SIZE:	11X17	CHKD:	FMF	DATE:	-
SCALE:	1:250	APVD:	FMF	DATE:	-

PROJECT:

BLACKWATER PROJECT

TITLE:

POWER LINE ACCESS TYPICAL SECTIONS CLASS C4 ASSUMING NEW CONSTRUCTION

DWG NO:	REV:
13PG0040-500-1920-003	**0**

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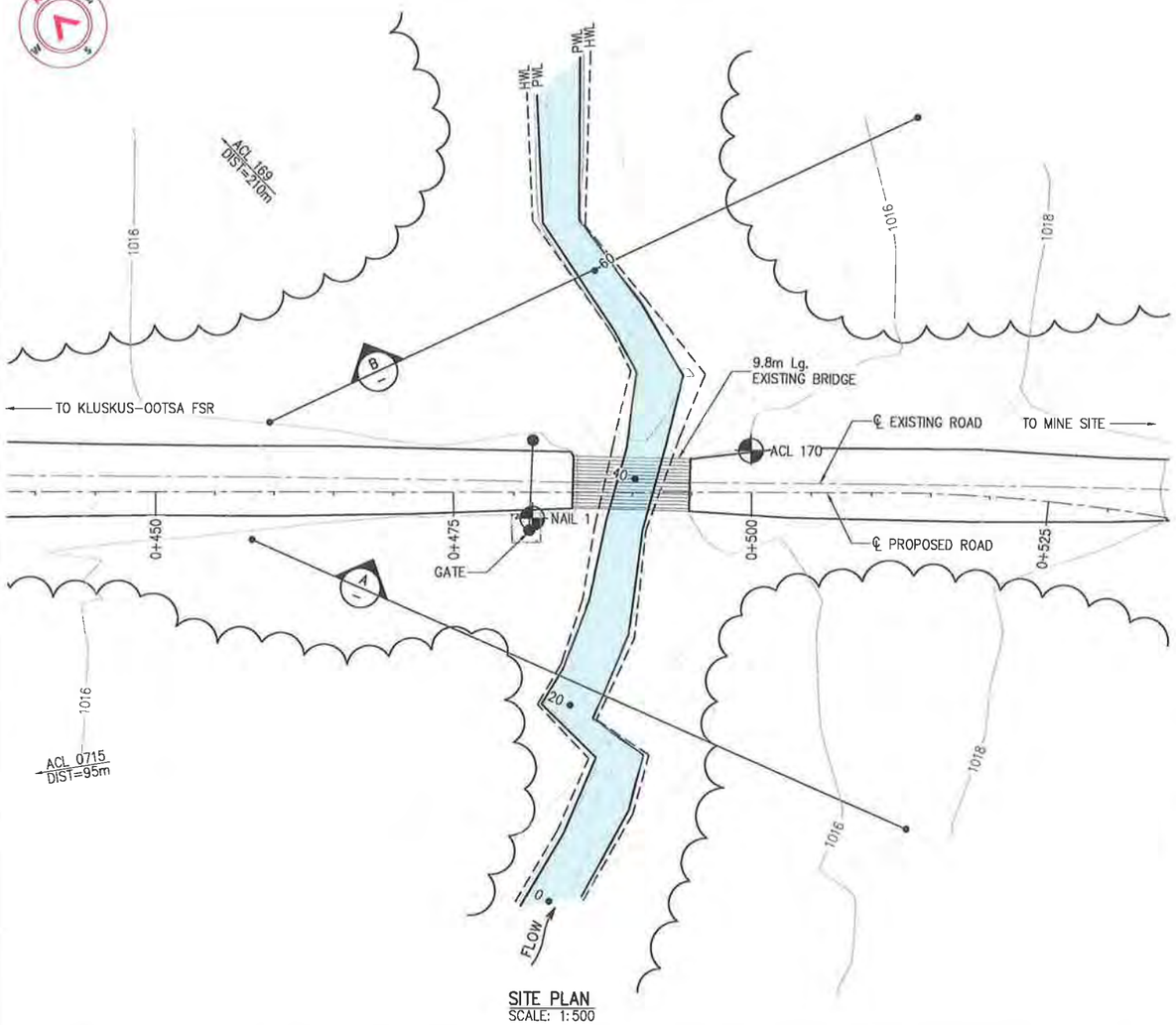
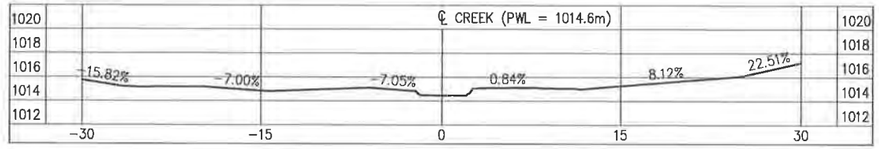
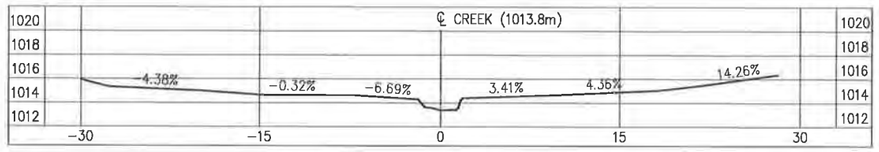


SITE PLAN
SCALE: 1:500

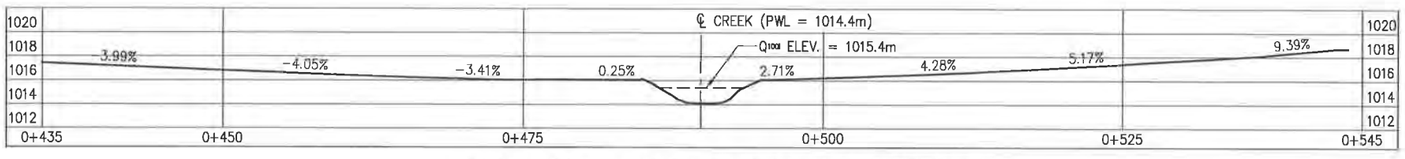
SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 169	5906200.827	378791.668	1028.368
ACL 170	5905947.665	378805.416	1016.153
ACL 0715	5906020.036	378670.387	1029.759
NAIL 1	5905956.301	378788.183	1016.059



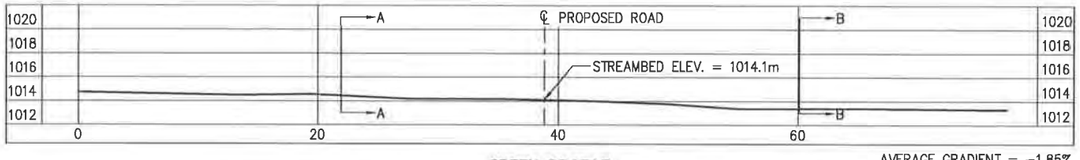
SECTION A
SCALE: 1:500



SECTION B
SCALE: 1:500



EXISTING GROUND PROFILE ALONG PROPOSED ROAD CENTERLINE
SCALE: 1:500



AVERAGE GRADIENT = -1.85%

CREEK PROFILE
SCALE: 1:500

SITE/SURVEY NOTES:

1. SITEPLAN WAS COMPLETED ON: 2012/10/17
2. SURVEY DATA WAS ESTABLISHED USING NO DECLINATION.
3. SITE SURVEYOR: S. JACOBS
   SITE RODMAN: K. MOE, B. KOOPS
4. STREAM RIPARIAN CLASSIFICATION: S3
5. DOMINANT RIPARIAN DESCRIPTION: SPRUCE/PINE
6. UTM COORDINATES: N5905952 E378796
7. HYDROLOGY:
   - DRAINAGE AREA: 54.2km²
   - ESTIMATED Q100 FLOW: 14.3m³/s
   - ESTIMATED VELOCITY: 2.4m/s
8. SUGGESTED BRIDGE STRUCTURE:
   - SPAN: 18.288m
   - MINIMUM U/S GIRDER: 1016.1m
9. NO GEOTECHNICAL REPORT HAS BEEN COMPLETED TO DATE.

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		5
		6
		7
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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/20	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:	-	DRWN:	CLT	DATE: 13/08/20
PROJECT NO:	13PG0040	DSGN:	CLT	DATE: 13/08/20
DRAWING SIZE:	ANSI "B"	CHKD:	FMF	DATE: 13/08/20
SCALE:	AS NOTED	APVD:	FMF	DATE: 13/08/20

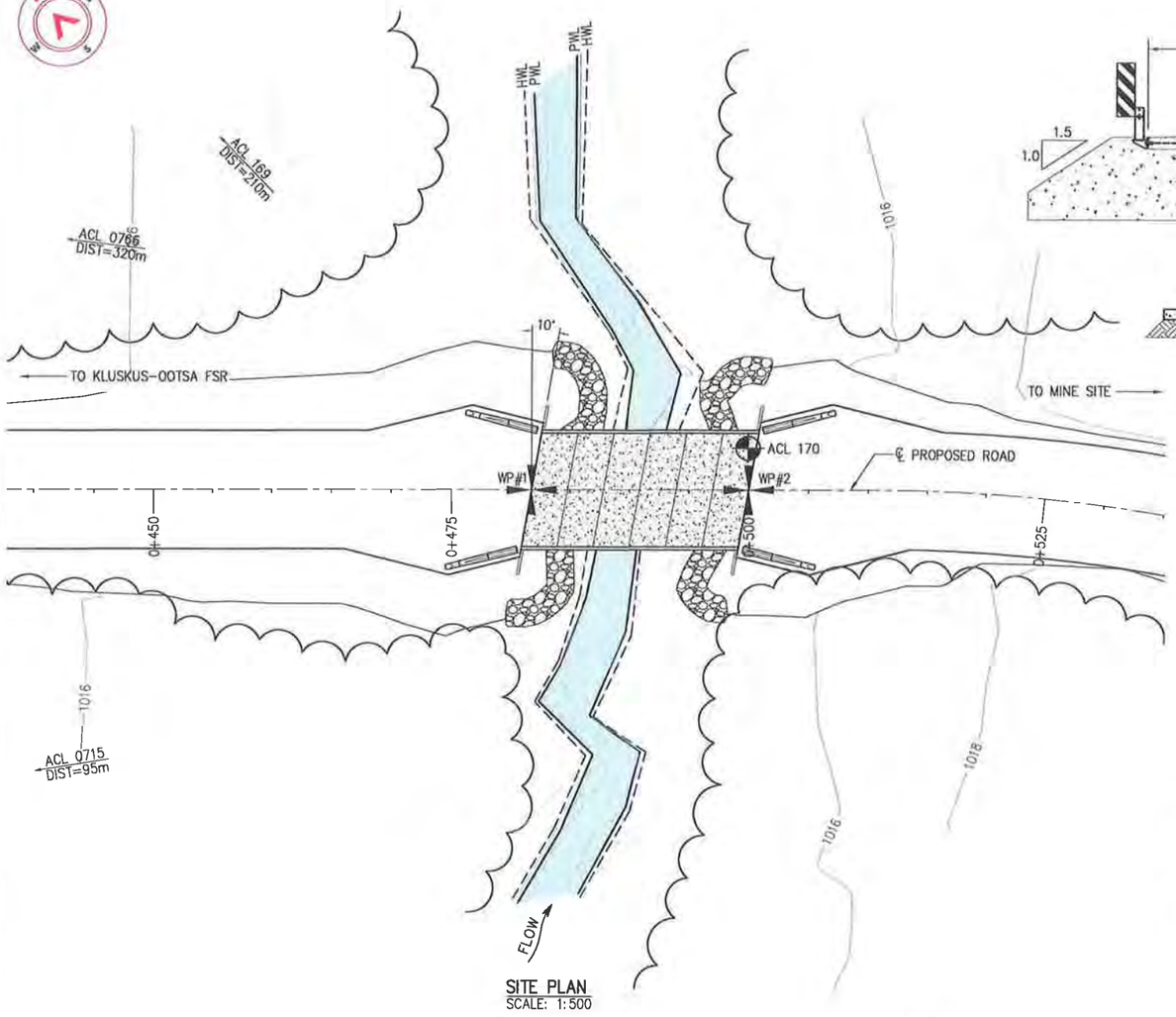
PROJECT:

BLACKWATER PROJECT
MINE ACCESS ROAD
TURTLE CREEK
CROSSING #1

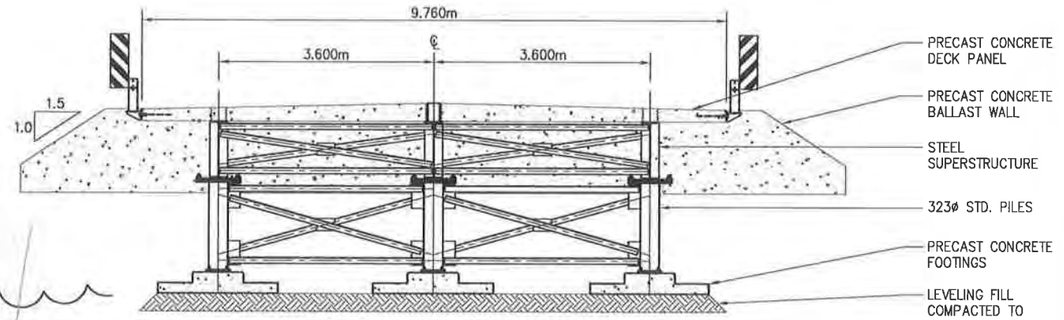
TITLE:

SITE PLAN, PROFILES, SECTIONS AND NOTES

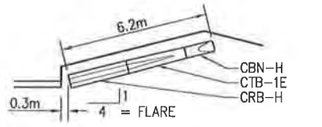
DWG NO: **13PG0040-100-1960-101**
REV: **0**



SITE PLAN
SCALE: 1:500



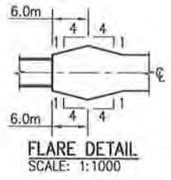
ABUTMENT ELEVATION (NON-SKEWED VIEW)
SCALE: 1:100



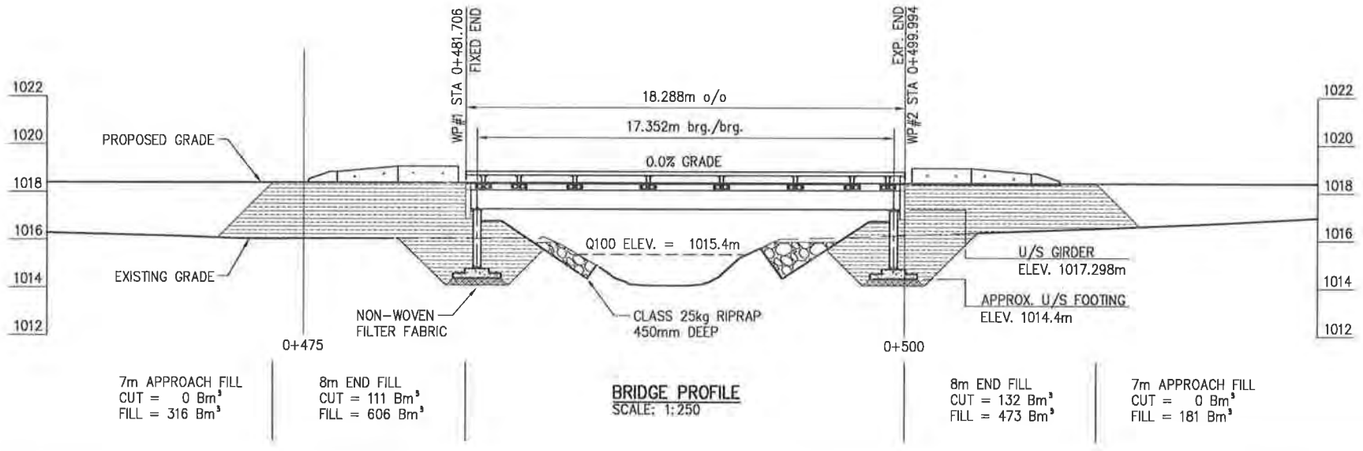
M.O.T. STANDARD CONCRETE BARRIER

PRECAST CONC. BARRIER DETAIL
SCALE 1:250

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 169	5906200.827	378791.668	1028.368
ACL 170	5905947.665	378805.416	1016.153
ACL 0715	5906020.036	378670.387	1029.759
ACL 0766	5906243.950	378579.474	1038.247
WP#1	5905957.775	378789.823	1018.393
WP#2	5905945.086	378802.993	1018.393



FLARE DETAIL
SCALE: 1:1000



BRIDGE PROFILE
SCALE: 1:250

ON SITE SPECIFICATIONS:

1. RIP-RAP SHALL EXTEND AROUND ABUTMENTS AS SHOWN ON THE PLAN. IT SHALL BE CLASS 25kg AND HAVE A MINIMUM DEPTH OF 450mm, 105m³ REQUIRED, CONSISTING OF THE FOLLOWING:

ROCK GRADATION:
PERCENTAGE LARGER THAN GIVEN ROCK MASS (kg)

85%	50%	15%
2.5kg	25kg	75kg
120ø	260ø	380ø

2. NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa.

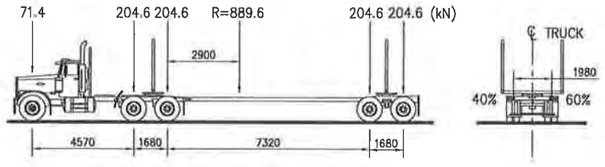
3. THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATION PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.

4. BACKFILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE. LIFTS SHALL ALTERNATE BOTH WAYS @ EACH END OF THE BRIDGE TO ENSURE MINIMAL MOVEMENT. USE LIGHT MECHANICAL TAMPERS ONLY.

5. ALL EXPOSED MINERAL SOILS MUST BE SEEDED USING RECLAMATION GRASS SEED MIXTURE AND COVERED WITH STRAW MULCH.

LOADING DIAGRAM L-100 OFF HIGHWAY G.V.W. = 90 680kg:

DESIGN IN ACCORDANCE WITH CAN/CSA-S6-06 WITH MODIFIED LOADING AS FOLLOWS:



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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/20	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO.		DRWN:	CLT	DATE: 13/08/20
PROJECT NO:	13PG0040	DSGN:	CLT	DATE: 13/08/20
DRAWING SIZE:	ANSI "B"	CHKD:	FMF	DATE: 13/08/20
SCALE:	AS NOTED	APVD:	FMF	DATE: 13/08/20

PROJECT:

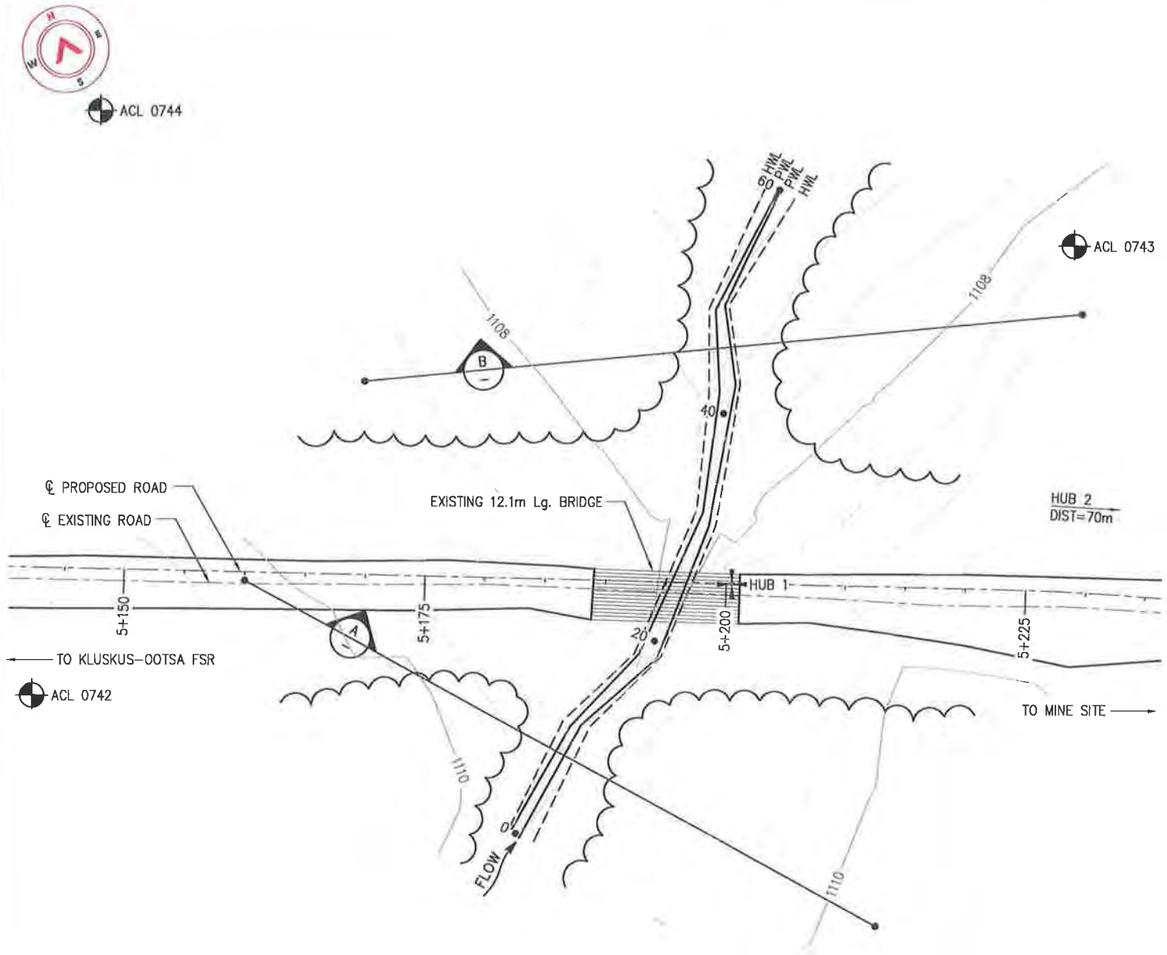
BLACKWATER PROJECT
MINE ACCESS ROAD
TURTLE CREEK
CROSSING #1

TITLE:

GENERAL ARRANGEMENT

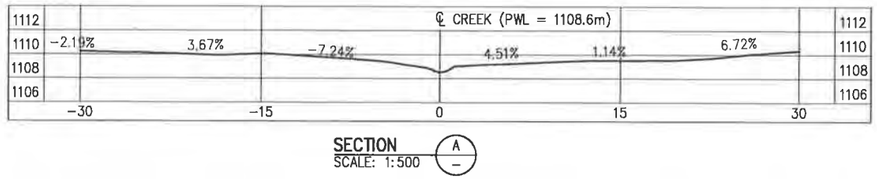
DWG NO: **13PG0040-100-1960-102**
REV: **0**

Date: 2013/08/20 | User: Christina Thorell | File: P:\PG\2013\01\13PG0040 New Gold\10 Eng\Dwgs\10 CivilSite 1\ACAD 13PG0040-100-1960-102 | Layout: 'B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm

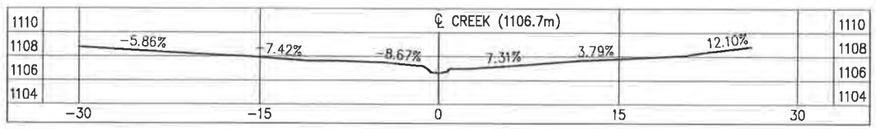


SITE PLAN
SCALE: 1:500

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 0742	5901530.158	379008.638	1111.777
ACL 0743	5901529.442	379103.131	1109.023
ACL 0744	5901572.569	379033.645	1109.019
HUB 1	5901515.101	379065.608	1109.842
HUB 2	5901478.305	379154.876	1108.902



SECTION A
SCALE: 1:500



SECTION B
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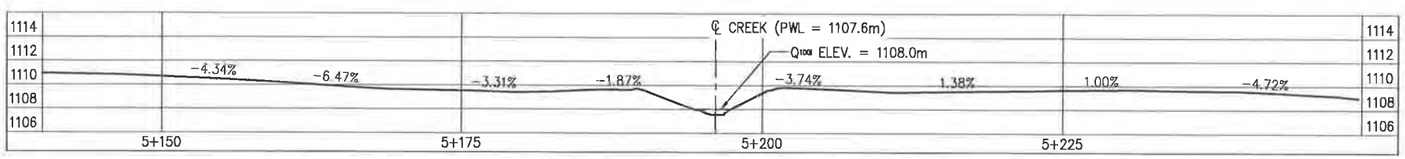
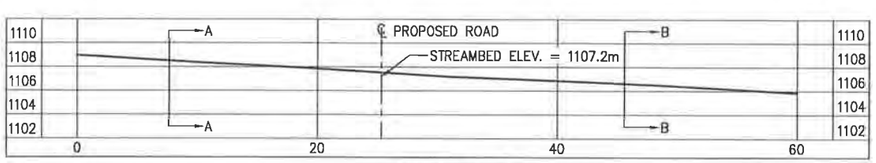


EXISTING GROUND PROFILE ALONG PROPOSED CENTERLINE
SCALE: 1:500



AVERAGE GRADIENT = −5.17%

CREEK PROFILE
SCALE: 1:500

SITE/SURVEY NOTES:

1. SITEPLAN WAS COMPLETED ON: 2012/10/18
2. SURVEY DATA WAS ESTABLISHED USING NO DECLINATION.
3. SITE SURVEYOR: S. JACOBS
   SITE RODMAN: K. MOE
4. STREAM RIPARIAN CLASSIFICATION: S4
5. DOMINANT RIPARIAN DESCRIPTION: SPRUCE/PINE
6. UTM COORDINATES: N5901517 E379063
7. HYDROLOGY:
   - DRAINAGE AREA: 5.9Km²
   - ESTIMATED Q100 FLOW: 3.9m³/s
   - ESTIMATED VELOCITY: 2.6m/s
8. SUGGESTED BRIDGE STRUCTURE:
   - SPAN: 13.000m
   - MINIMUM U/S GIRDER: 1108.7m
9. NO GEOTECHNICAL REPORT HAS BEEN COMPLETED TO DATE.

REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
		1
		2
		3
		4
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		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/20	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:		DRWN: CLT	DATE: 13/08/20
PROJECT NO:	13PG0010	DSGN: CLT	DATE: 13/08/20
DRAWING SIZE:	ANSI "B"	CHKD: FMF	DATE: 13/08/20
SCALE:	AS NOTED	APVD: FMF	DATE: 13/08/20

PROJECT:

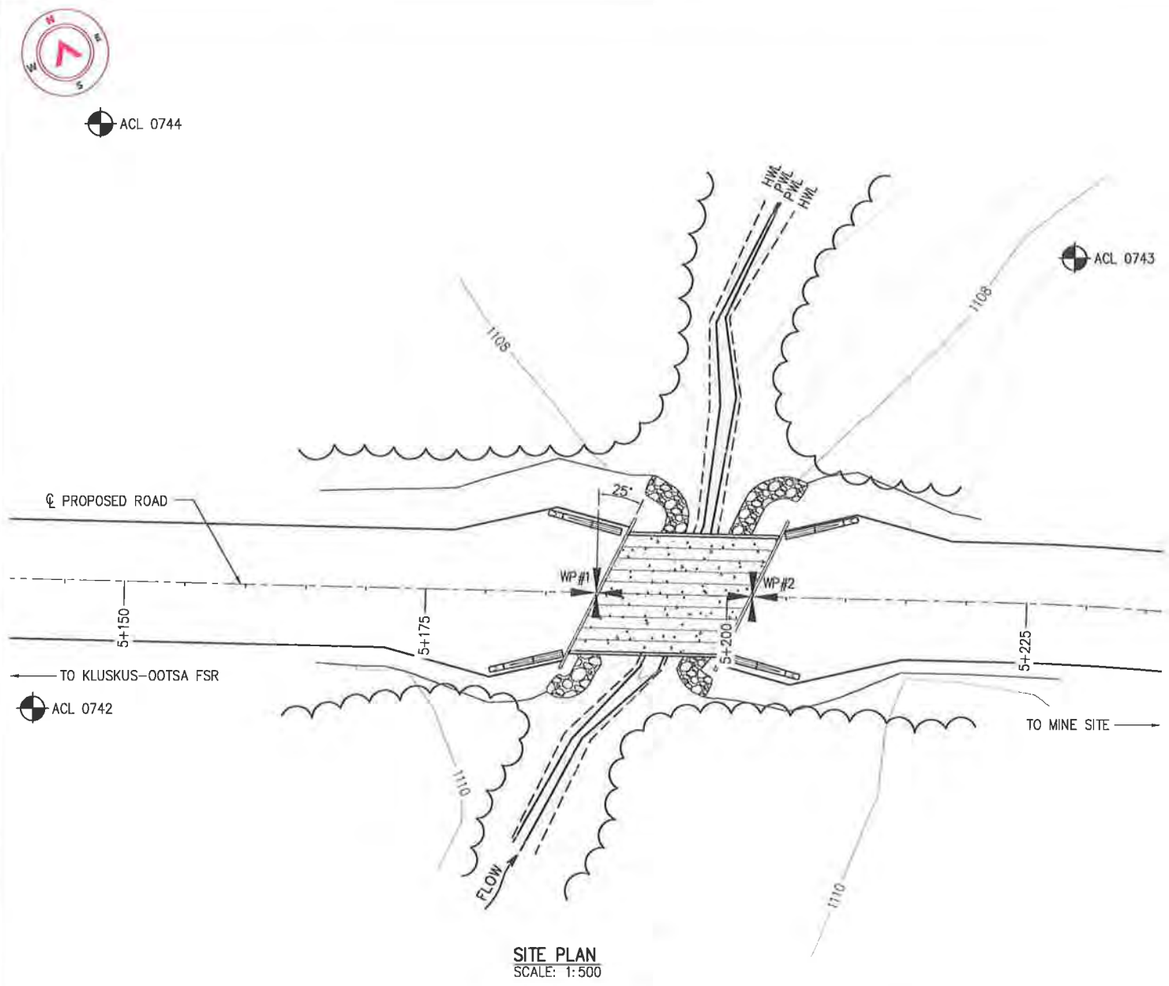
BLACKWATER PROJECT
MINE ACCESS ROAD
DAVIDSON CREEK TRIBUTARY CROSSING #2

TITLE:

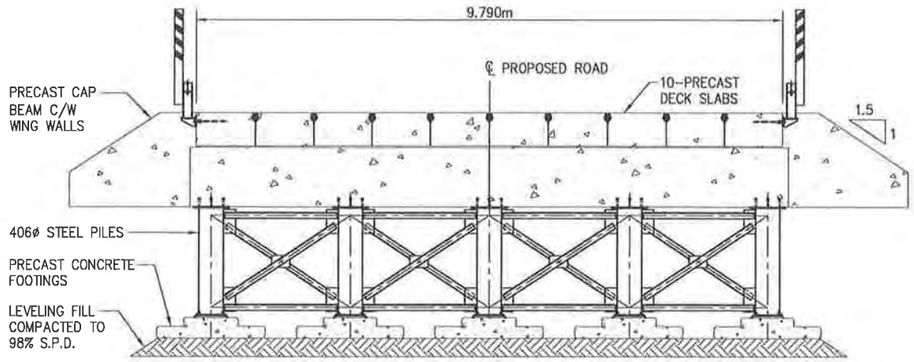
SITE PLAN, PROFILES, SECTIONS AND NOTES

DWG NO: **13PG0040-100-1960-201**
REV: **0**

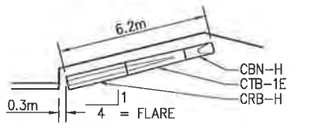
Date: 2013/08/20 | User: Christina Thorell | File: P:\PG\2013\01\13PG0040 New Gold\10 Eng\Dwg\100 Civil\Site Z\13PG0040-100-1960-201 | Layout: "B" Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm



SITE PLAN
SCALE: 1:500



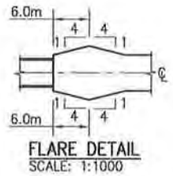
ABUTMENT ELEVATION (NOT SKEWED FOR CLARITY)
SCALE: 1:100



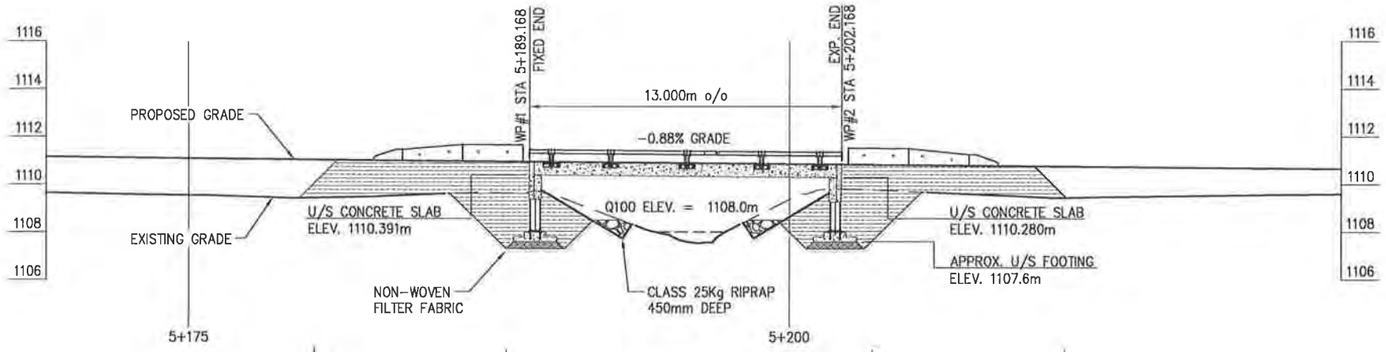
M.O.T. STANDARD CONCRETE BARRIER

PRECAST CONC. BARRIER DETAIL
SCALE 1:250

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 0742	5901530.158	379008.638	1111.777
ACL 0743	5901529.442	379103.131	1109.023
ACL 0744	5901572.569	379033.645	1109.019
WP# 1	5901519.986	379055.400	1110.953
WP# 2	5901514.417	379067.146	1110.838



FLARE DETAIL
SCALE: 1:1000



7m APPROACH FILL	8m END FILL		8m END FILL	7m APPROACH FILL
CUT = 0 Bm³	CUT = 115 Bm³		CUT = 58 Bm³	CUT = 0 Bm³
FILL = 176 Bm³	FILL = 377 Bm³		FILL = 296 Bm³	FILL = 142 Bm³

BRIDGE PROFILE
SCALE: 1:250

ON SITE SPECIFICATIONS:

1. RIP-RAP SHALL EXTEND AROUND ABUTMENTS AS SHOWN ON THE PLAN. IT SHALL BE CLASS 25Kg AND HAVE A MINIMUM DEPTH OF 450mm, 40m³ REQUIRED, CONSISTING OF THE FOLLOWING:

ROCK GRADATION:
PERCENTAGE LARGER THAN GIVEN ROCK MASS (kg)

85%	50%	15%
2.5kg	25kg	75kg
120ø	260ø	380ø

2. NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa.

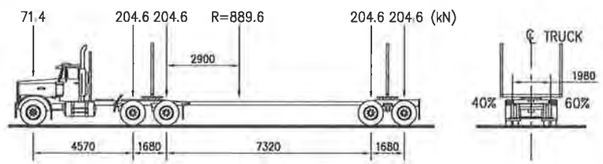
3. THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATION PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.

4. BACKFILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE. LIFTS SHALL ALTERNATE BOTH WAYS @ EACH END OF THE BRIDGE TO ENSURE MINIMAL MOVEMENT. USE LIGHT MECHANICAL TAMPERS ONLY.

5. ALL EXPOSED MINERAL SOILS MUST BE SEEDED USING RECLAMATION GRASS SEED MIXTURE AND COVERED WITH STRAW MULCH.

LOADING DIAGRAM L-100 OFF HIGHWAY G.V.W. = 90 680kg:

DESIGN IN ACCORDANCE WITH CAN/CSA-S6-06 WITH MODIFIED LOADING AS FOLLOWS:



REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
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		3
		4
		5
		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/20	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:	-	DRWN: CLT	DATE: 13/08/20
PROJECT NO:	13PG0040	DSGN: CLT	DATE: 13/08/20
DRAWING SIZE:	ANSI "B"	CHKD: FMF	DATE: 13/08/20
SCALE:	AS NOTED	APVD: FMF	DATE: 13/08/20

PROJECT:

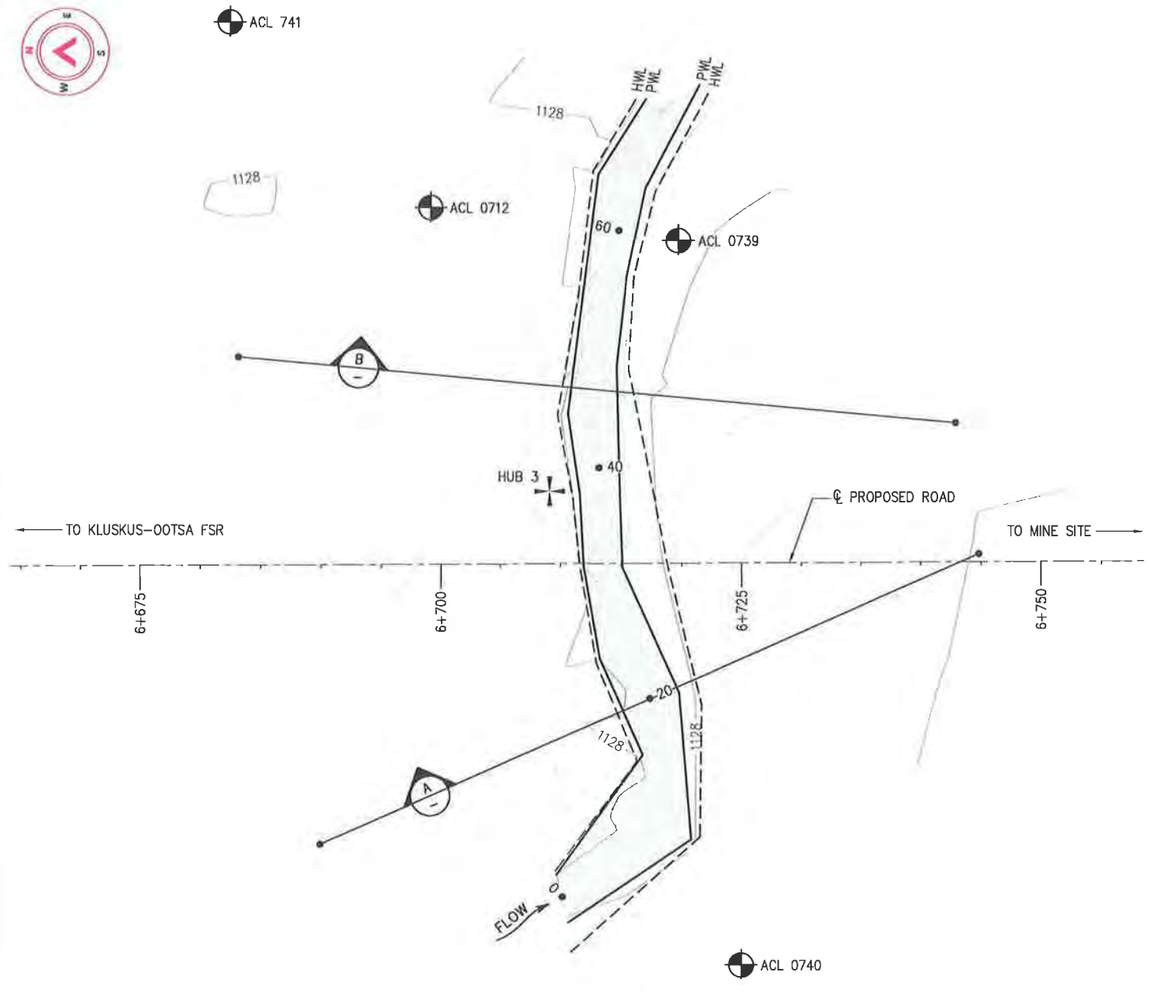
BLACKWATER PROJECT
MINE ACCESS ROAD
DAVIDSON CREEK TRIBUTARY CROSSING #2

TITLE:

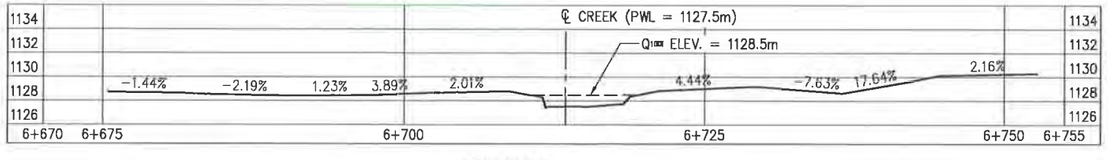
GENERAL ARRANGEMENT

DWG NO: **13PG0040-100-1960-202** REV: **0**

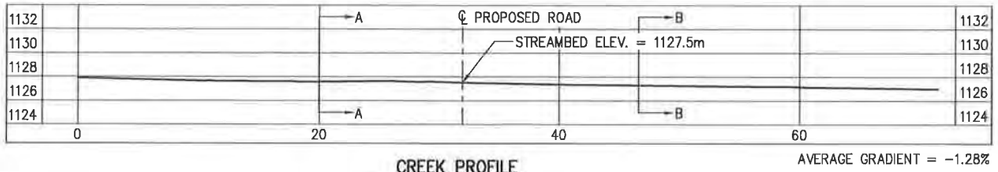
Date: 2013/08/21 | User: Christina Thorell | File: P:\PG\2013\13PG0040 New Gold\10 Eng\Dwgs\10 10 Civil\Site 2\ACAD-13PG0040-100-1960-202 | Layout: B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm



SITE PLAN
SCALE: 1:500



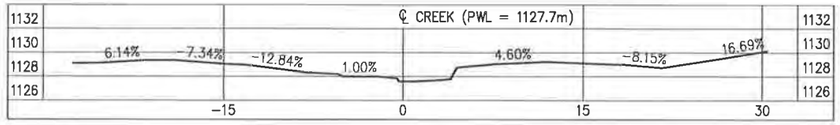
PROPOSED ROAD PROFILE
SCALE: 1:500



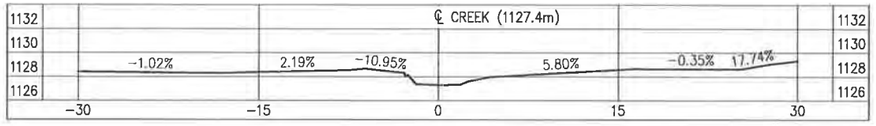
AVERAGE GRADIENT = −1.28%

CREEK PROFILE
SCALE: 1:500

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 741	5900174.074	378965.136	1128.175
ACL 0712	5900156.810	378950.250	1128.069
ACL 0739	5900136.105	378948.217	1128.106
ACL 0740	5900128.584	378887.878	1129.607
HUB 3	5900145.947	378926.883	1128.827



SECTION A
SCALE: 1:500



SECTION B
SCALE: 1:500

SITE/SURVEY NOTES:

1. SITEPLAN WAS COMPLETED ON: 2012/10/18
2. SURVEY DATA WAS ESTABLISHED USING NO DECLINATION.
3. SITE SURVEYOR: S. JACOBS
   SITE RODMAN: K. MOE
4. STREAM RIPARIAN CLASSIFICATION: S3
5. DOMINANT RIPARIAN DESCRIPTION: SPRUCE–PINE
6. UTM COORDINATES: N5900140 E378921
7. HYDROLOGY:
   - DRAINAGE AREA: 48.5Km²
   - ESTIMATED Q100 FLOW: 13.8m³/s
   - ESTIMATED VELOCITY: 1.8m/s
8. SUGGESTED BRIDGE STRUCTURE:
   - SPAN: 18.288m
   - MINIMUM U/S GIRDER: 1129.2m
9. NO GEOTECHNICAL REPORT HAS BEEN COMPLETED TO DATE.

REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
		1
		2
		3
		4
		5
		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/21	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:	-	DRWN: CLT	DATE: 13/08/21
PROJECT NO:	13PG0040	DSGN: CLT	DATE: 13/08/21
DRAWING SIZE:	ANSI "B"	CHKD: FMF	DATE: 13/08/21
SCALE:	AS NOTED	APVD: FMF	DATE: 13/08/21

PROJECT:

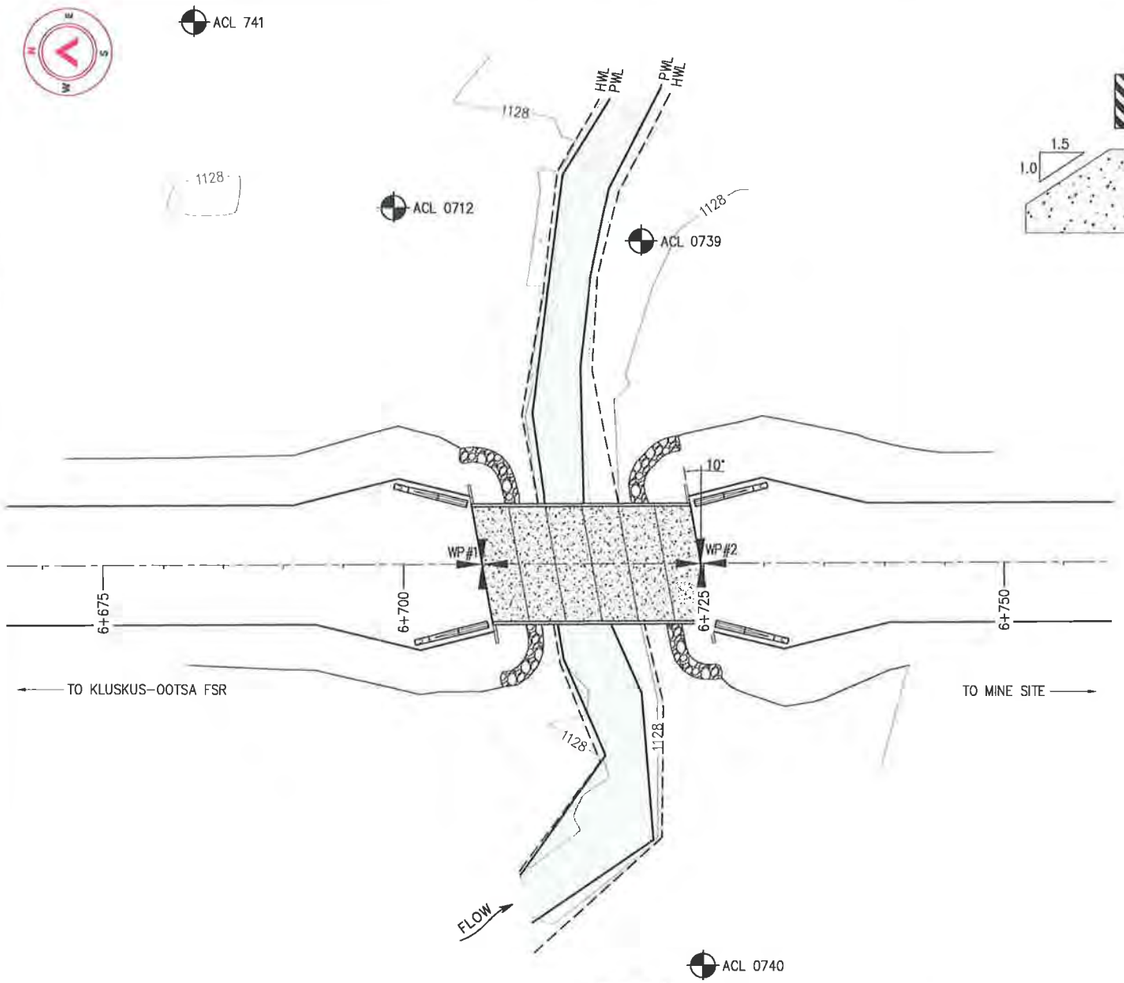
BLACKWATER PROJECT
MINE ACCESS ROAD
DAVIDSON CREEK
CROSSING #3

TITLE:

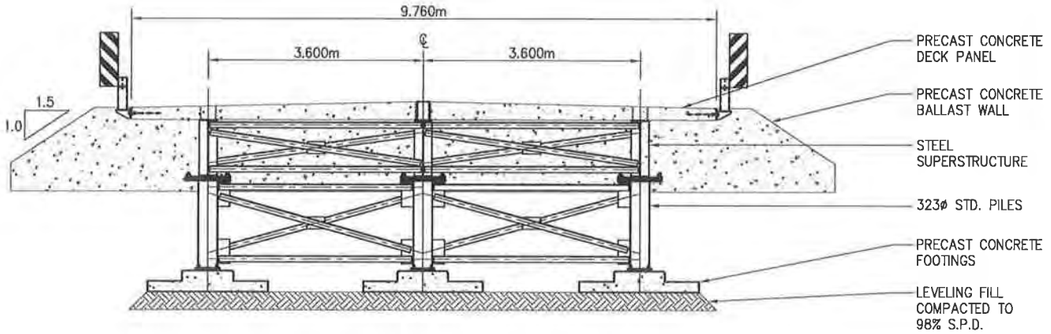
SITE PLAN, PROFILES, SECTIONS AND NOTES

DWG NO: **13PG0040-100-1960-301**
REV: **0**

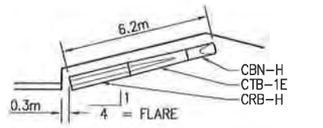
Date: 2013/08/23 | User: Christina Thorell | File: P:\PG\2013\0\13PG0040 New Gold\10 Eng\Dwgs\10 10 Civil\Site 2\13PG0040-100-1960-301 | Layout: 'B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm



SITE PLAN
SCALE: 1:500

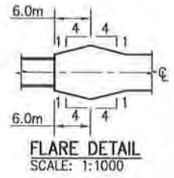


ABUTMENT ELEVATION (NON-SKEWED VIEW)
SCALE: 1:100

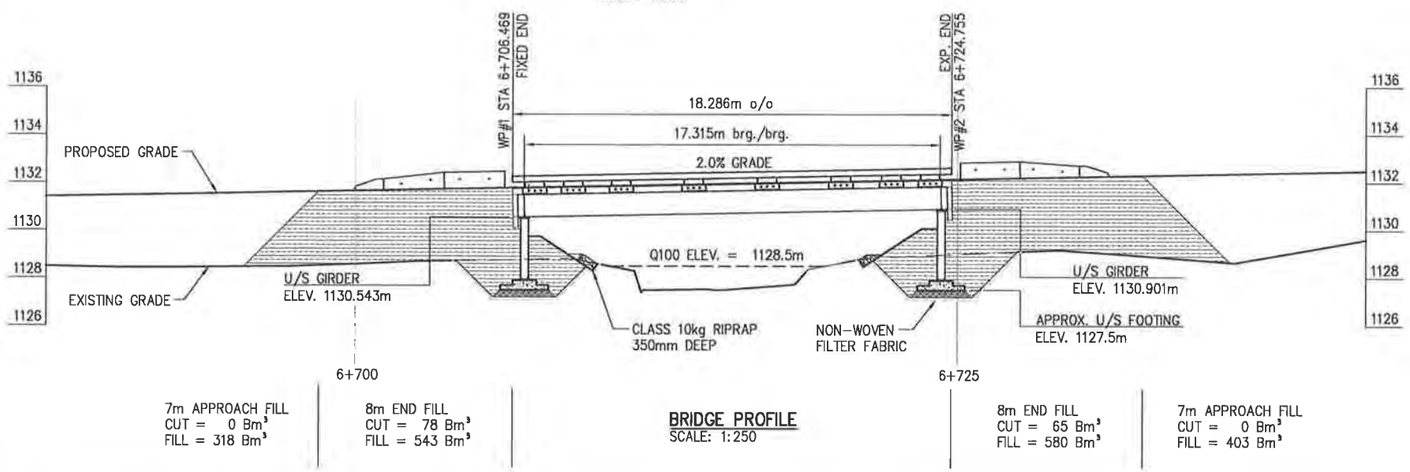


M.O.T. STANDARD CONCRETE BARRIER

PRECAST CONC. BARRIER DETAIL
SCALE 1:250



FLARE DETAIL
SCALE: 1:1000



7m APPROACH FILL	8m END FILL		8m END FILL	7m APPROACH FILL
CUT = 0 Bm³	CUT = 78 Bm³		CUT = 65 Bm³	CUT = 0 Bm³
FILL = 318 Bm³	FILL = 543 Bm³		FILL = 580 Bm³	FILL = 403 Bm³

BRIDGE PROFILE
SCALE: 1:250

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 741	5900174.074	378965.136	1128.175
ACL 0712	5900156.810	378950.250	1128.069
ACL 0739	5900136.105	378948.217	1128.106
ACL 0740	5900128.584	378887.878	1129.607
WP#1	5900148.355	378920.711	1131.787
WP#2	5900130.085	378921.471	1132.152

ON SITE SPECIFICATIONS:

1. RIP-RAP SHALL EXTEND AROUND ABUTMENTS AS SHOWN ON THE PLAN. IT SHALL BE CLASS 10Kg AND HAVE A MINIMUM DEPTH OF 350mm, 15m³ REQUIRED, CONSISTING OF THE FOLLOWING:

ROCK GRADATION:
PERCENTAGE LARGER THAN GIVEN ROCK MASS (kg)

85%	50%	15%
1kg	10kg	30kg
90ø	195ø	280ø

2. NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa.

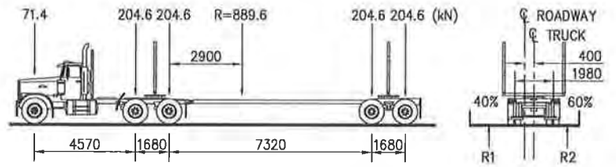
3. THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATION PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.

4. BACKFILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE. LIFTS SHALL ALTERNATE BOTH WAYS @ EACH END OF THE BRIDGE TO ENSURE MINIMAL MOVEMENT. USE LIGHT MECHANICAL TAMPERS ONLY.

5. ALL EXPOSED MINERAL SOILS MUST BE SEEDED USING RECLAMATION GRASS SEED MIXTURE AND COVERED WITH STRAW MULCH.

LOADING DIAGRAM L-100 OFF HIGHWAY G.V.W. = 90 680kg:

DESIGN IN ACCORDANCE WITH CAN/CSA-S6-06 WITH MODIFIED LOADING AS FOLLOWS:



REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
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		3
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		5
		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/21	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:		DRWN:	CLT	DATE: 13/08/21
PROJECT NO:	13PG0040	DSGN:	CLT	DATE: 13/08/21
DRAWING SIZE:	ANSI "B"	CHKD:	FMF	DATE: 13/08/21
SCALE:	AS NOTED	APVD:	FMF	DATE: 13/08/21

PROJECT:

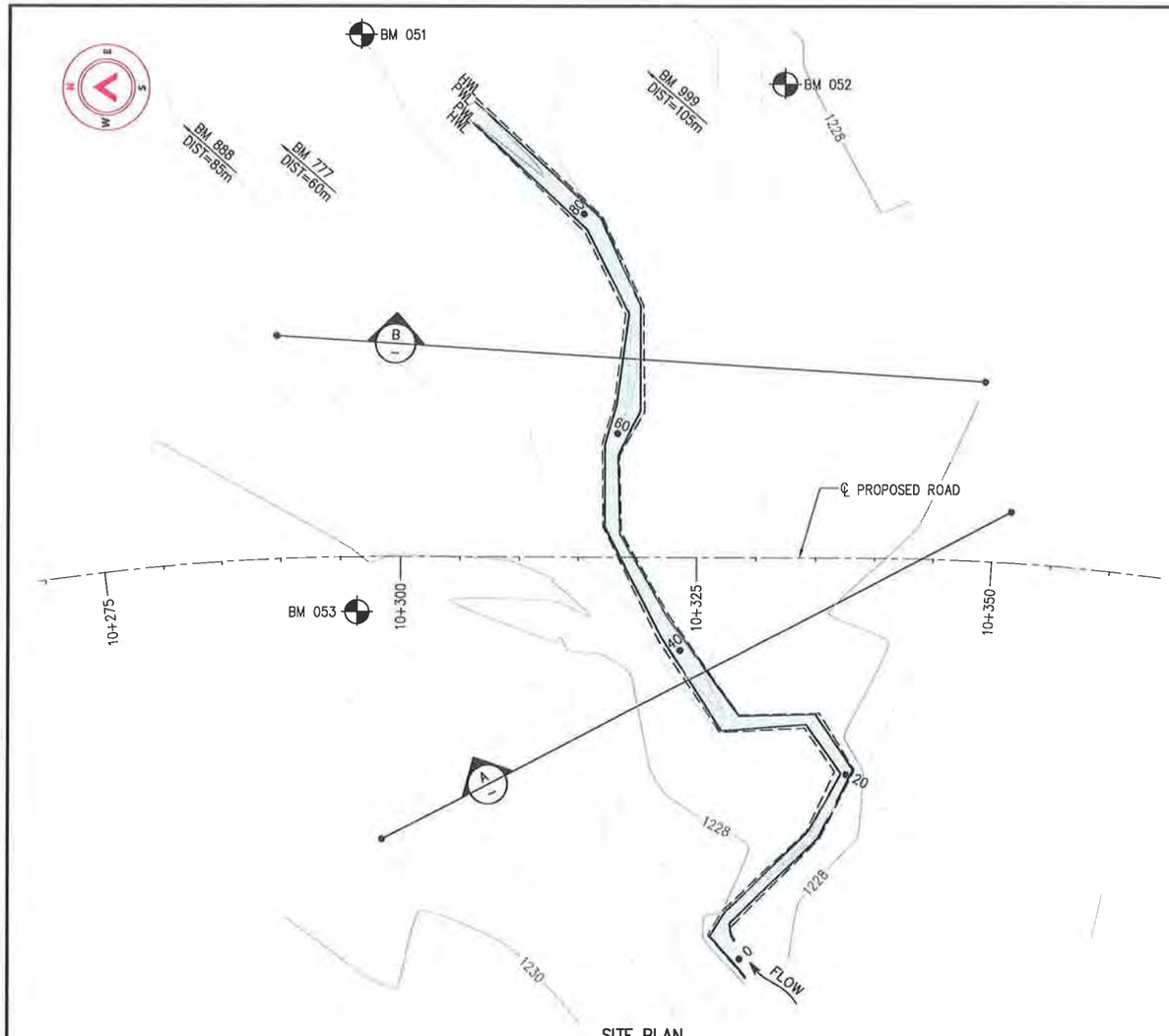
BLACKWATER PROJECT
MINE ACCESS ROAD
DAVIDSON CREEK
CROSSING #3

TITLE:

GENERAL ARRANGEMENT

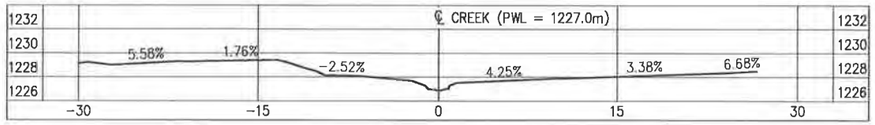
DWG NO: **13PG0040-100-1960-302** REV: **0**

Date: 2013/08/23 | User: Christina Thorell | File: P:\PG\2013\01\13PG0040 New Gold\10 Eng\Dwgs\10 10 Civil\Site 2\ACAD-13PG0040-100-1960-302 (18.288m) | Layout: 'B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm

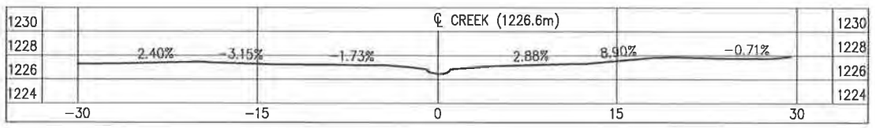


SITE PLAN
SCALE: 1:500

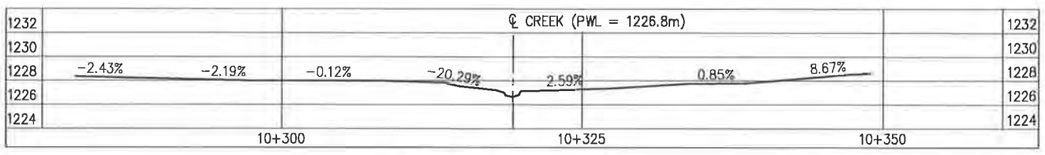
SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
BM 051	5897014.973	378844.661	1226.303
BM 052	5896979.200	378841.103	1228.157
BM 053	5897014.381	378795.625	1228.118
BM 777	5897062.389	378870.320	1228.236
BM 888	5897089.715	378888.156	1227.018
BM 999	5897065.270	378906.115	1225.941



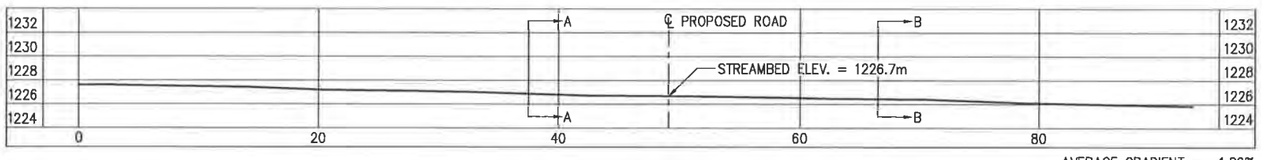
SECTION A
SCALE: 1:500



SECTION B
SCALE: 1:500



PROPOSED ROAD PROFILE
SCALE: 1:500



AVERAGE GRADIENT = −1.89%

CREEK PROFILE
SCALE: 1:500

SITE/SURVEY NOTES:

1. SITEPLAN WAS COMPLETED ON: 2013/07/16
2. SURVEY DATA WAS ESTABLISHED USING NO DECLINATION.
3. SITE SURVEYOR: S. JACOBS
   SITE RODMAN: D. MAIN
4. STREAM RIPARIAN CLASSIFICATION: S4
5. DOMINANT RIPARIAN DESCRIPTION: SPRUCE
   UTM COORDINATES: N5896992 E378815
6. HYDROLOGY:
   - DRAINAGE AREA: 4.9km²
   - ESTIMATED Q100 FLOW: 3.4m³/s
   - ESTIMATED VELOCITY: 1.7m/s
7. SUGGESTED BRIDGE STRUCTURE:
   - SPAN: 14.000m
   - MINIMUM U/S GIRDER: 1228.3m
8. NO GEOTECHNICAL REPORT HAS BEEN COMPLETED TO DATE.

REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
		1
		2
		3
		4
		5
		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/27	ISSUED FOR REVIEW	CLT	FMF

CLIENT: newgold

Allnorth

CLIENT NO:		DRWN: CLT	DATE: 13/08/27
PROJECT NO:	13PG0040	DSGN: CLT	DATE: 13/08/27
DRAWING SIZE:	ANSI "B"	CHKD: FMF	DATE: 13/08/27
SCALE:	AS NOTED	APVD: FMF	DATE: 13/08/27

PROJECT:

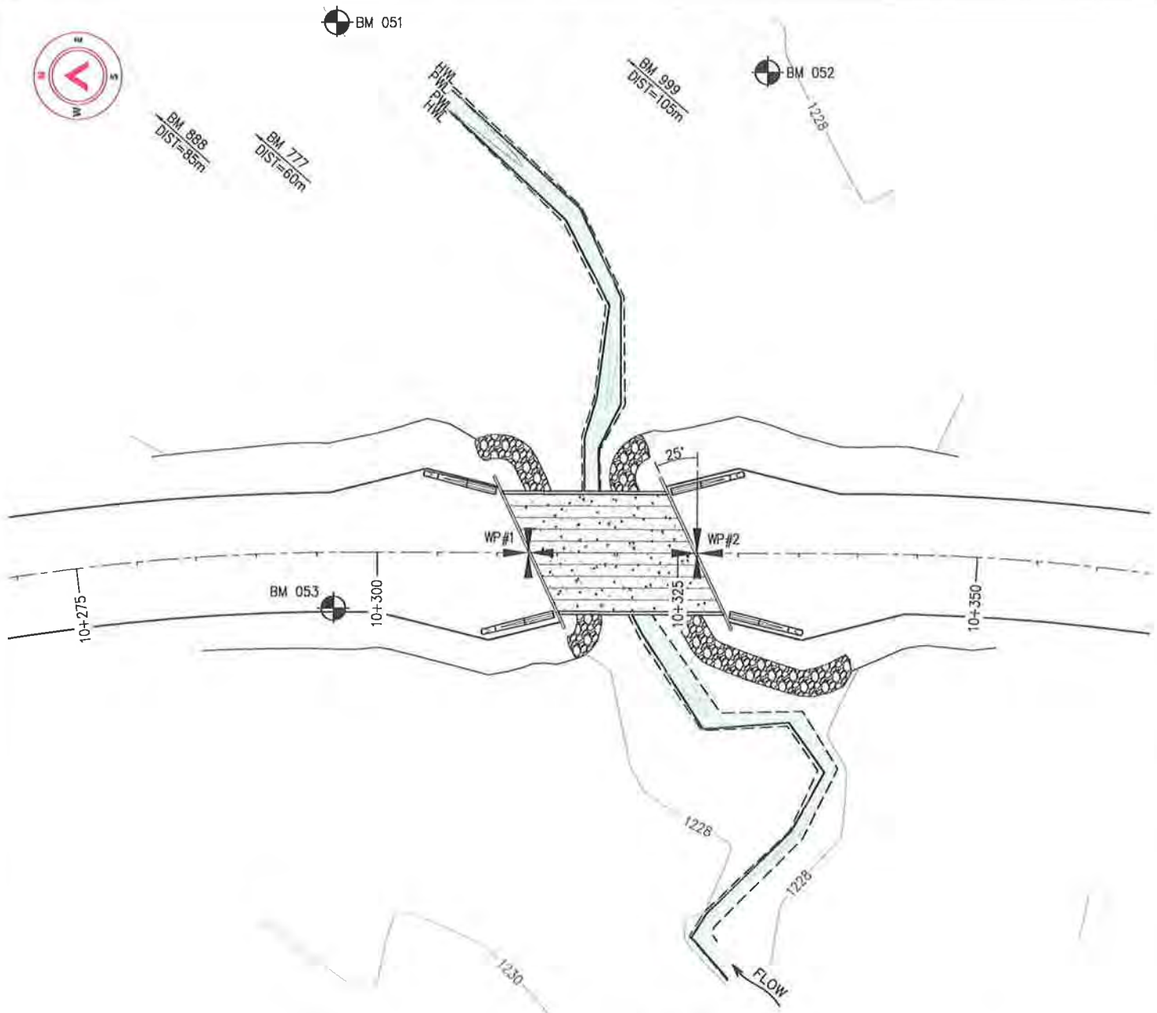
BLACKWATER PROJECT
MINE ACCESS ROAD
UNKNOWN CREEK
CROSSING #4

TITLE:

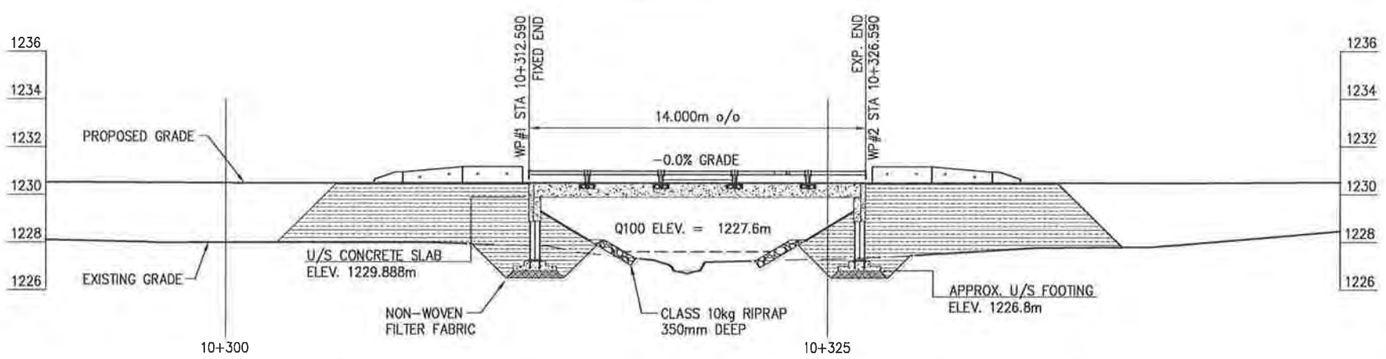
SITE PLAN, PROFILES, SECTIONS AND NOTES

DWG NO: **13PG0040-100-1960-401**
REV: **0**

Date: 2013/08/28 | User: Christina Thorell | File: C:\00 Work\2013\13-PG-0040 Blackwater\Site 4\13PG0040-100-1960-401 | Layout: 'B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm

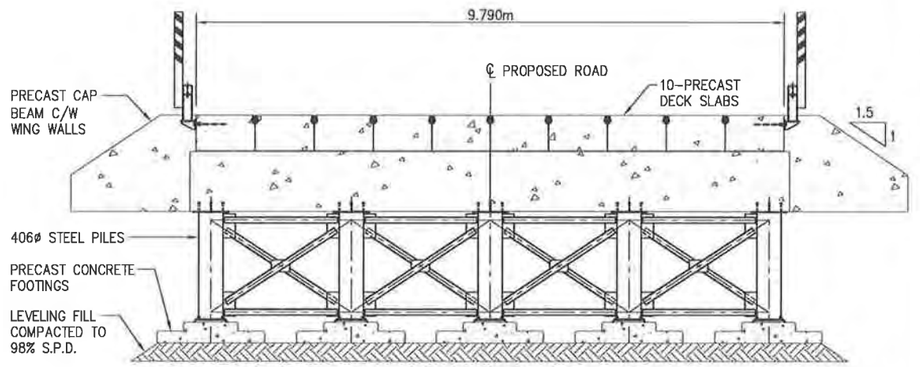


SITE PLAN
SCALE: 1:500

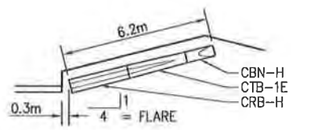


7m APPROACH FILL	8m END FILL		8m END FILL	7m APPROACH FILL
CUT = 0 Bm³	CUT = 78 Bm³		CUT = 47 Bm³	CUT = 0 Bm³
FILL = 259 Bm³	FILL = 469 Bm³		FILL = 521 Bm³	FILL = 280 Bm³

BRIDGE PROFILE
SCALE: 1:250



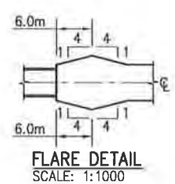
ABUTMENT ELEVATION (NOT SKEWED FOR CLARITY)
SCALE: 1:100



M.O.T. STANDARD
CONCRETE BARRIER

PRECAST CONC. BARRIER DETAIL
SCALE 1:250

SURVEY INFORMATION			
DESCRIPTION	NORTHING	EASTING	ELEVATION
BM 051	5897014.973	378844.661	1226.303
BM 052	5896979.200	378841.103	1228.157
BM 053	5897014.381	378795.625	1228.118
BM 777	5897062.389	378870.320	1228.236
BM 888	5897089.715	378888.156	1227.018
BM 999	5897065.270	378906.115	1225.941
WP# 1	5896998.260	378800.550	1230.478
WP# 2	5896984.261	378800.758	1230.478



FLARE DETAIL
SCALE: 1:1000

ON SITE SPECIFICATIONS:

1. RIP-RAP SHALL EXTEND AROUND ABUTMENTS AS SHOWN ON THE PLAN. IT SHALL BE CLASS 10kg AND HAVE A MINIMUM DEPTH OF 350mm, 40m³ REQUIRED, CONSISTING OF THE FOLLOWING:

ROCK GRADATION:
PERCENTAGE LARGER THAN GIVEN ROCK MASS (kg)

85%	50%	15%
1kg	10kg	30kg
90ø	195ø	280ø

2. NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa.

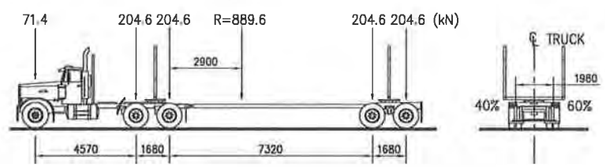
3. THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATION PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.

4. BACKFILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE. LIFTS SHALL ALTERNATE BOTH WAYS @ EACH END OF THE BRIDGE TO ENSURE MINIMAL MOVEMENT. USE LIGHT MECHANICAL TAMPERS ONLY.

5. ALL EXPOSED MINERAL SOILS MUST BE SEEDED USING RECLAMATION GRASS SEED MIXTURE AND COVERED WITH STRAW MULCH.

LOADING DIAGRAM L-100 OFF HIGHWAY G.V.W. = 90 680kg:

DESIGN IN ACCORDANCE WITH CAN/CSA-S6-06 WITH MODIFIED LOADING AS FOLLOWS:



REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
		1
		2
		3
		4
		5
		6
		7
		8

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
0	13/08/27	ISSUED FOR REVIEW	CLT	FMF

CLIENT:
newgold

Allnorth

CLIENT NO:		DRWN:	CLT	DATE: 13/08/27
PROJECT NO:	13PG0040	DSGN:	CLT	DATE: 13/08/27
DRAWING SIZE:	ANSI "B"	CHKD:	FMF	DATE: 13/08/27
SCALE:	AS NOTED	APVD:	FMF	DATE: 13/08/27

PROJECT:
BLACKWATER PROJECT
MINE ACCESS ROAD
UNKNOWN CREEK
CROSSING #4

TITLE:
GENERAL ARRANGEMENT

DWG NO: **13PG0040-100-1960-402**
REV: **0**

Date: 2013/09/28 | User: Christina Thorell | File: C:\00 Work\2013\13-PG-0040 Blackwater\Site 4\ACAD-13PG0040-100-1960-402.dwg | Layout: 'B' Landscape (Vertical Title) | Paper Size: 558.8mm x 431.8mm

370 000 E
380 000 E
390 000 E
5 910 000 N
5 900 000 N
5 890 000 N
N
TRANSMISSION LINE
FIRST NATIONS RESERVATION
CHEDAKUZ CREEK
NEW GOLD PROPERTY BOUNDARY
KLUSKUS FSR
TURTLE CREEK
MINE ACCESS ROAD
AIRSTRIP
B4
DAVIDSON CREEK
TATELKUZ LAKE
WATER SUPPLY INTAKE
AIRSTRIP ACCESS ROAD
WATER SUPPLY PIPELINE ROAD
SAND AND GRAVEL SCREENING PLANT
ESKER BORROW SOURCE
TOP LAKE
FAWNIE CREEK
FRESH WATER RESERVOIR AND DISCHARGE TO DAVIDSON CREEK
CREEK 661
TSF SITE D
ENVIRONMENTAL CONTROL DAM (ECD)
TSF SITE C
CAMP
EXISTING ACCESS
CREEK 705
PLANT SITE
LOW-GRADE ORE STOCKPILE
OPEN PIT
WASTE ROCK / OVERBURDEN DUMPS
KUYAKUZ LAKE

LEGEND:

- TAILINGS BEACH
- POND
- EMBANKMENT FILL
- NAG WASTE ROCK / OVERBURDEN
- LOW GRADE ORE
- TOPSOIL
- SURVEYED PARCELS
- WATER SUPPLY PUMPSTATION
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- NEW GOLD PROPERTY BOUNDARY
- FIRST NATIONS RESERVATIONS
- EXISTING FORESTRY ROAD
- TRANSMISSION LINE

NOTES:

1. CONTOUR INTERVALS ARE APPROXIMATELY 30 METRES, BASED ON THE CANVEC TOPOGRAPHIC DATABASE FROM NATURAL RESOURCES CANADA.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. THIS GENERAL ARRANGEMENT SHOWS THE MAXIMUM EXTENTS OF ALL PROJECT FACILITIES.

SCALE A 1000 500 0 1000 2000 3000 4000 5000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	24MAY'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

PROJECT AREA GENERAL ARRANGEMENT

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	VA13-01065

FIGURE 1 REV A

SAVED: M:\1\01\00457\06\A\Acad\FIGS\B16_A, 5/24/2013 1:09:32 PM - ANASIRI PRINTED: 5/24/2013 1:10:36 PM, Layout1, ANASIRI
XREF FILES: MAGE FILES

370 000 E

375 000 E

380 000 E

5 900 000 N

5 895 000 N

MINE ACCESS ROAD

SAND AND GRAVEL SCREENING PLANT

WATER SUPPLY PIPELINE SERVICE ROAD

FRESH WATER RESERVOIR EL. 1170 m

CONSTRUCTION SEDIMENT CONTROL POND EL. 1192 m

COFFER DAM EL.1208 m

CONSTRUCTION SEDIMENT CONTROL POND EL. 1247 m

EXISTING MINE ACCESS ROAD

EL. 1355 m

EL. 1325 m

POND EL. 1285 m

TOPSOIL STOCKPILE

TRUCK SHOP

CONSTRUCTION LAY DOWN

COFFER DAM EL. 1348 m

PLANT SITE EL. 1425

CONVEYOR

CRUSHER

FUEL STORAGE

LAYDOWN AREA 1

LAYDOWN AREA 2

EXPLOSIVE FACILITIES

OPEN PIT

CONSTRUCTION CAMP

PERMANENT CAMP

LEGEND:

- POND
- EMBANKMENT FILL
- TOPSOIL
- BORROW AREA (ZONES S, C, AND ROCKFILL)
- PUMPSTATION
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- DIVERSION CHANNEL
- TRANSMISSION LINE
- NEW GOLD PROPERTY BOUNDARY

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	31MAY'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT END OF YEAR -2 PLAN

Knight Piésold CONSULTING

P/A NO. VA101-457/6

REF NO. VA13-01109

FIGURE 3

REV A

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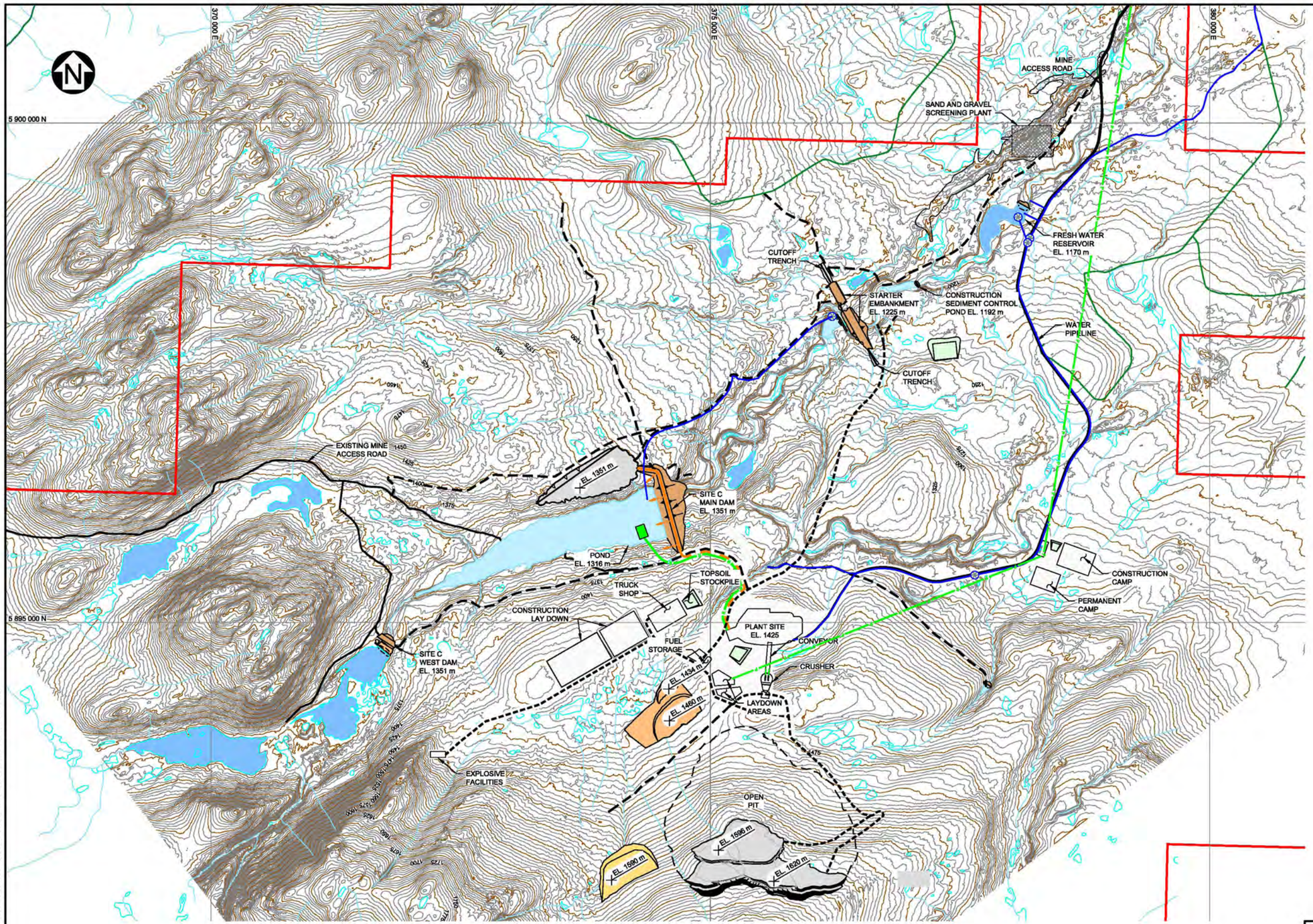

LEGEND:

- POND
- EMBANKMENT FILL
- PAG WASTE ROCK
- NAG WASTE ROCK / OVERBURDEN
- NAG 3 WASTE ROCK
- LOW-GRADE ORE
- TOPSOIL
- BORROW AREA (ZONES S, C, AND ROCKFILL)
- RECLAIM SYSTEM
- PUMPSTATION
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- EXISTING ACCESS TRAILS
- DIVERSION CHANNEL
- WATER RECLAIM PIPELINE
- TRANSMISSION LINE
- NEW GOLD PROPERTY BOUNDARY
- TAILINGS PIPELINE
- TAILINGS DEPOSIT

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A: 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	31MAY'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT
END OF YEAR -1
PLAN

Knight Piésold CONSULTING

P/A NO. VA101-457/6

REF NO. VA13-01109

FIGURE 4

REV A

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XREF FILES: IMAGE FILE(S)

370 000 E

375 000 E

380 000 E

5 900 000 N

5 895 000 N

SAND AND GRAVEL SCREENING PLANT

FRESH WATER RESERVOIR EL. 1170 m

CONSTRUCTION SEDIMENT CONTROL POND EL. 1189 m

STARTER EMBANKMENT EL. 1240 m

POND EL. 1225 m

CONSTRUCTION SEDIMENT CONTROL POND EL. 1247 m

EXISTING MINE ACCESS ROAD

EL. 1351 m

EL. 1361 m

POND EL. 1334m

TRUCK SHOP

CONSTRUCTION LAY DOWN

FUEL STORAGE

PLANT SITE EL. 1425

CONVEYOR

CRUSHER

CONSTRUCTION CAMP

OPERATIONS CAMP

SITE C WEST DAM EL. 1351 m

EL. 1434 m

EL. 1460 m

EXPLOSIVE FACILITIES

EL. 1535 m

EL. 1550 m

EL. 1570 m

EL. 1590 m

LEGEND:

- TAILINGS BEACH
- POND
- EMBANKMENT
- PAG WASTE ROCK
- NAG WASTE ROCK / OVERBURDEN
- NAG 3 WASTE ROCK
- LOW-GRADE ORE
- TOPSOIL
- BORROW AREA (ZONES S, C, AND ROCKFILL)
- RECLAIM SYSTEM
- RECLAIM SYSTEM
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- EXISTING ACCESS TRAILS
- DIVERSION CHANNEL
- WATER RECLAIM PIPELINE
- NEW GOLD PROPERTY BOUNDARY
- TAILINGS PIPELINE
- TAILINGS DEPOSIT

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	31MAY'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT END OF YEAR 1 PLAN

Knight Piésold CONSULTING

P/A NO. VA101-457/6

REF NO. VA13-01109

FIGURE 5

REV A

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XREF FILES: IMAGE FILES:

370 000 E
375 000 E
380 000 E
5 900 000 N
8 895 000 N
MINE ACCESS ROAD
SAND AND GRAVEL SCREENING PLANT
DAVIDSON CREEK
SEEPAGE COLLECTION TRENCH
WATER SUPPLY PIPELINE SERVICE ROAD
ESKER BORROW SOURCE
PAG STOCKPILE LIMIT EL.1325 m
EL. 1317 m
FRESH WATER RESERVOIR EL. 1170 m
ENVIRONMENTAL CONTROL DAM (ECD) EL. 1178 m
TOPSOIL STOCKPILE EL.1245 m
EL. 1305 m
SITE C MAIN DAM BORROW SOURCE
EL. 1351 m
EL. 1346 m
EL. 1351 m
SITE C MAIN DAM
EL. 1317 m
TRUCK SHOP
CONSTRUCTION CAMP
OPERATIONS CAMP
CONSTRUCTION LAY DOWN
PLANT SITE EL. 1425
CONVEYOR
SITE C WEST DAM EL. 1351 m
FUEL STORAGE
CRUSHER
EL. 1346 m
EL. 1345 m
LOW-GRADE STOCKPILE
EL. 1440 m
EL. 1460 m
EL. 1475 m
EL. 1470 m
EL. 1490 m
EL. 1495 m
EXPLOSIVE FACILITIES
EL. 1510 m
EAST DUMP
EL. 1530 m
EL. 1635 m
WEST DUMP
OPEN PIT
EL. 1550 m
EL. 1570 m
EL. 1590 m

LEGEND:

- UPLAND BEACH
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- UPLAND SLOPE
- TAILINGS BEACH
- POND
- EMBANKMENT FILL
- PAG WASTE ROCK
- NAG WASTE ROCK / OVERBURDEN
- LOW-GRADE ORE
- TOPSOIL
- RECLAIM SYSTEM
- WATER SUPPLY PUMPSTATION
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- FRESH WATER FLOW DIRECTION
- WATER RECLAIM PIPELINE
- NEW GOLD PROPERTY BOUNDARY
- TRANSMISSION LINE
- SPILLWAY
- SEEPAGE COLLECTION TRENCH
- TAILINGS PIPELINE
- TAILINGS DEPOSITION

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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XR: FILE01 IMAGE FILE02

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT
END OF YEAR 8
PLAN

Knight Piésold CONSULTING

PIA NO. VA101-457/6

REF NO. VA13-01109

FIGURE 6

REV A

370 000 E
375 000 E
380 000 E
5 900 000 N
5 895 000 N
MINE ACCESS ROAD
SAND AND GRAVEL SCREENING PLANT
DAVIDSON CREEK
SEEPAGE COLLECTION TRENCH
WATER SUPPLY PIPELINE SERVICE ROAD
ESKER BORROW SOURCE
PAG STOCKPILE LIMIT EL.1325 m
EL. 1339 m
FRESH WATER RESERVOIR EL. 1170 m
ENVIRONMENTAL CONTROL DAM (ECD) EL. 1178 m
TOPSOIL STOCKPILE EL.1245 m
EL. 1334 m
SITE D MAIN DAM
SITE C MAIN DAM BORROW SOURCE
EL. 1351 m
EL. 1346 m
EL. 1351 m
EL. 1339 m
TRUCK SHOP
CONSTRUCTION CAMP
OPERATIONS CAMP
CONSTRUCTION LAY DOWN
PLANT SITE EL. 1425
CONVEYOR
SITE C WEST DAM EL. 1351 m
FUEL STORAGE
CRUSHER
LOW-GRADE STOCKPILE
EL. 1346 m
EL. 1345 m
EXPLOSIVE FACILITIES
EL. 1475 m
EL. 1495 m
EAST DUMP
EL. 1510 m
EL. 1530 m
EL. 1550 m
EL. 1570 m
EL. 1590 m
WEST DUMP
OPEN PIT
EL. 1635 m
BACKFILL EL. 1338 m

LEGEND:

- UPLAND BEACH
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- UPLAND SLOPE
- TAILINGS BEACH
- POND
- EMBANKMENT FILL
- PAG WASTE ROCK
- NAG WASTE ROCK / OVERBURDEN
- LOW-GRADE ORE
- TOPSOIL
- RECLAIM SYSTEM
- WATER SUPPLY PUMPSTATION
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- FRESH WATER FLOW DIRECTION
- WATER RECLAIM PIPELINE
- NEW GOLD PROPERTY BOUNDARY
- TRANSMISSION LINE
- SPILLWAY
- SEEPAGE COLLECTION TRENCH
- TAILINGS PIPELINE
- TAILINGS DEPOSITION

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	24MAY'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT
END OF YEAR 17
PLAN

Knight Piésold CONSULTING

PIA NO. VA101-457/6 | REF NO. VA13-01065

FIGURE 2 | REV A

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XREF FILES: MAGE FILES

370 000 E
375 000 E
380 000 E
5 900 000 N
5 895 000 N
MINE ACCESS ROAD
CONTINGENCY WETLAND AREA
EXPOSED TAILINGS BEACH COVERED WITH 1m OF OVERBURDEN
PLUNGE POOL
PAG STOCKPILE LIMIT
DOWNSTREAM WETLAND AREA
OUTLET CHANNEL TO DAVIDSON CREEK
OVERFLOW SPILLWAY
EL. 1351 m
EL. 1346 m
SPILLWAY
PIT INFLOW DEFLECTION BERM
PLANT SITE EL. 1425
LOW-GRADE STOCKPILE
EL. 1510 m
EL. 1530 m
EL. 1550 m
EL. 1570 m
EL. 1590 m
WEST DUMP
OUTLET CHANNEL TO TSF
PIT LAKE
EL. 1495 m
EL. 1475 m
EL. 1535 m
EAST DUMP

LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- POND
- ROCK SLOPES
- MINE ACCESS ROAD
- DIVERSION CHANNEL
- SEEPAGE COLLECTION TRENCH
- SPILLWAY

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
A	06JUN'13	ISSUED FOR EIA INFORMATION PACKAGE	DDF	AN	-	-

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT POST CLOSURE PLAN

Knight Piésold CONSULTING

PIA NO. VA101-457/6

REF NO. VA13-01147

FIGURE 7

REV A

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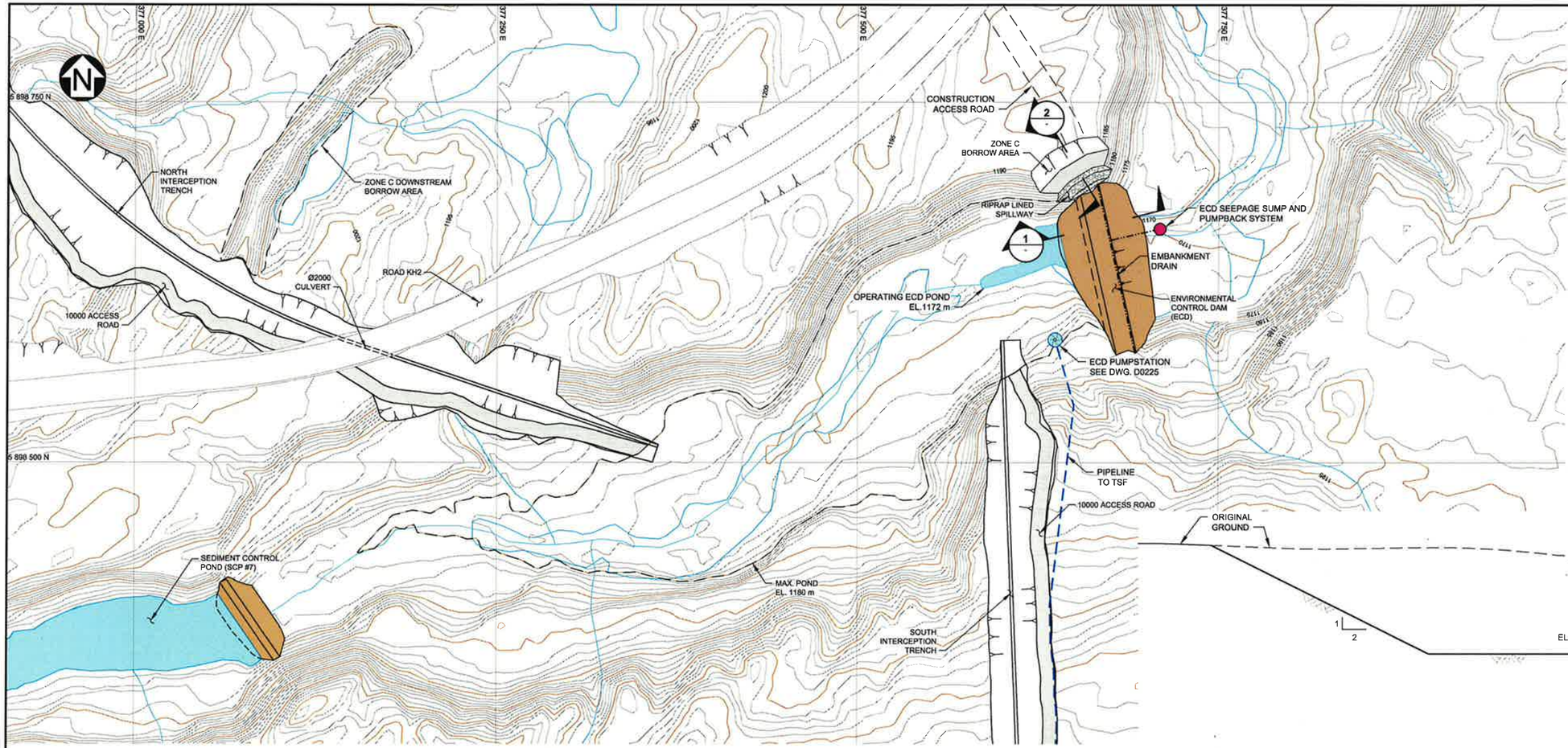


PLAN
ENVIRONMENTAL CONTROL DAM
SCALE A

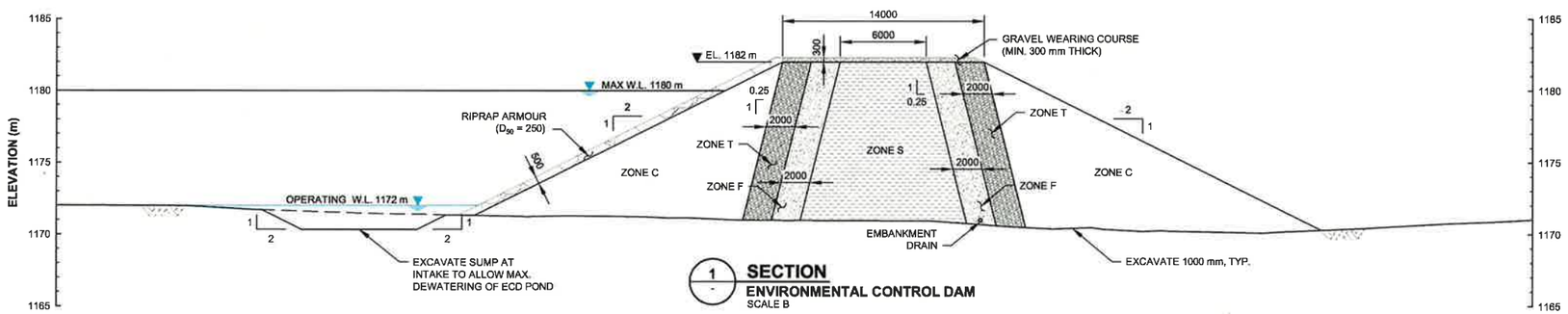
LEGEND:

- MINE WATER
- EMBANKMENT FILL
- RIPRAP
- PUMPSTATION
- ECD PIPELINE

NOTES:

1. CONTOUR INTERVAL IS 1 METRES.
2. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METRES, UNLESS OTHERWISE NOTED.
3. UPSTREAM ZONE C MUST BE FREE DRAINING SAND AND GRAVEL.
4. DOWNSTREAM ZONE T WILL INCLUDE DRAIN PIPE AND OUTLET EXTENDING BEYOND THE DAM TOE TO A COLLECTION SUMP AND PUMPBACK SYSTEM.
5. SPILLWAY CREST ELEVATION SET AT 1:100 YEAR 24 hr STORM EVENT MAXIMUM WATER LEVEL.
6. MAXIMUM WATER LEVEL SHOWN IN THIS DRAWING (1180m) REPRESENTS 1:100 YEAR 24 hr STORM EVENT.
7. INTERCEPTION TRENCHES EXCAVATED TO LOW PERMEABILITY SUBGRADE.

2 SECTION
SPILLWAY
SCALE C



1 SECTION
ENVIRONMENTAL CONTROL DAM
SCALE B

NOT FOR CONSTRUCTION

SCALE C: 3 1.5 0 5 10 15 m
SCALE B: 4 2 0 4 8 12 16 20 m
SCALE A: 50 25 0 50 100 150 200 250 m

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	04DEC13	ISSUED FOR USE	DDF	AN	BR			

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — D. D. FONTAINE # 36208 — Dec. 4, 2013

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APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: FEASIBILITY STUDY

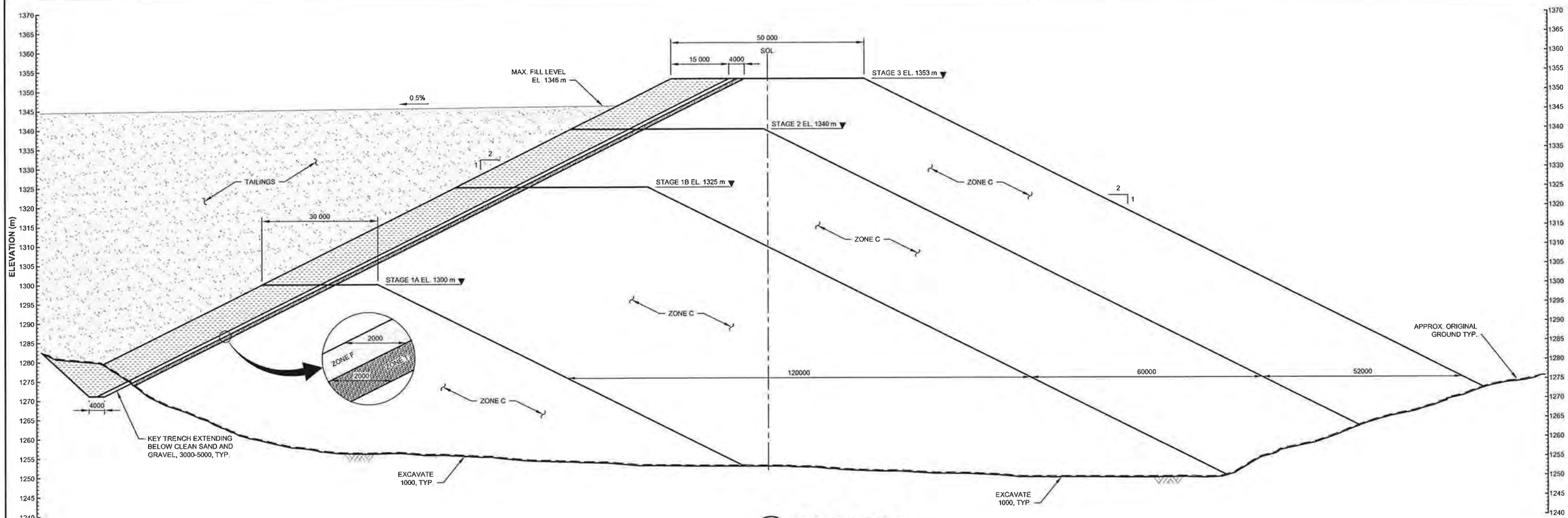
PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		OES	DDF	08NOV13
SCALE: VARIES	PACKAGE CODE	DRN	AN	08NOV13
		CHK	BR	04DEC13
		APP	BR	04DEC13

newgold

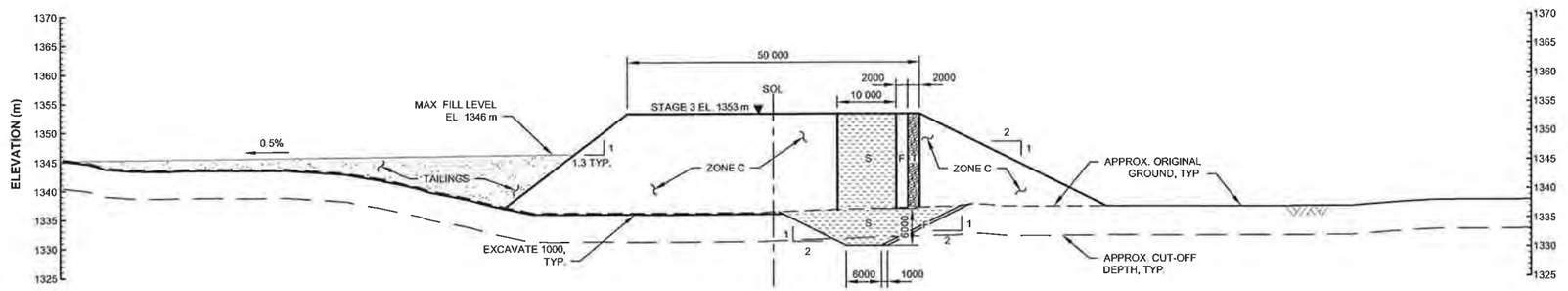
SUBJECT: ENVIRONMENTAL CONTROL DAM PLAN AND SECTION

Knight Piésold CONSULTING

AREA
CLIENT DWG. NO.
DRAWING NO. D0221
REV. 0



1 TYPICAL SECTION
SITE C MAIN DAM
SCALE A



2 TYPICAL SECTION
WEST DAM
SCALE A

LEGEND:

- ZONE S (CORE ZONE)
- ZONE F (FILTER)
- ZONE T (TRANSITION)
- ZONE C
- TAILINGS

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE

NOT FOR CONSTRUCTION

SCALE A 10 5 0 10 20 30 40 50 m

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
D. D. FONTAINE
36208
Dec 4, 2013

APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE
FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	DDF	08NOV13
SCALE	PACKAGE CODE	DRN	AN	08NOV13
1:500		CHK	BR	04DEC13
		APP	SRM	04DEC13

newgold

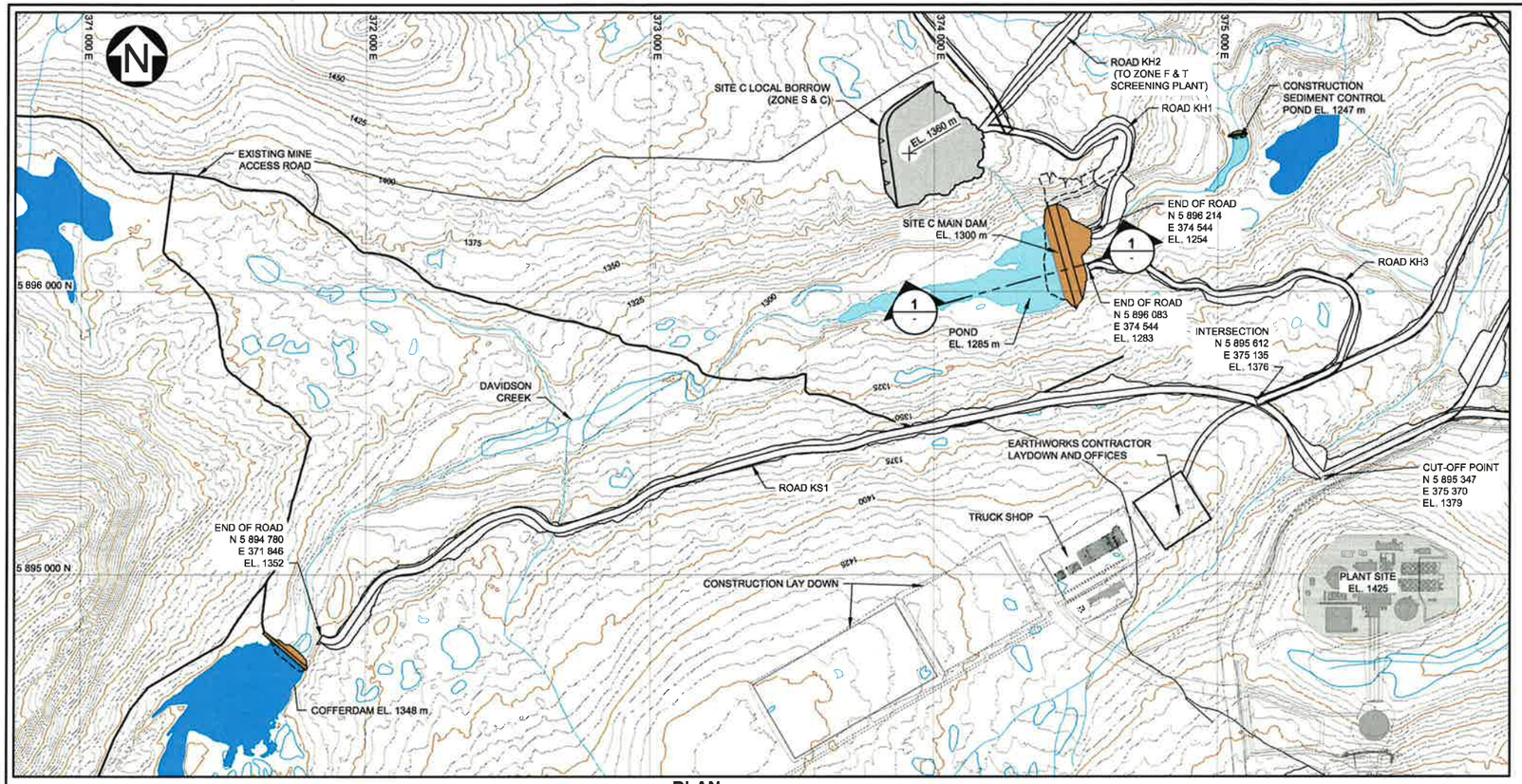
SUBJECT
TAILINGS STORAGE FACILITY
SITE C
MAIN DAM AND WEST DAM SECTIONS

Knight Piésold CONSULTING

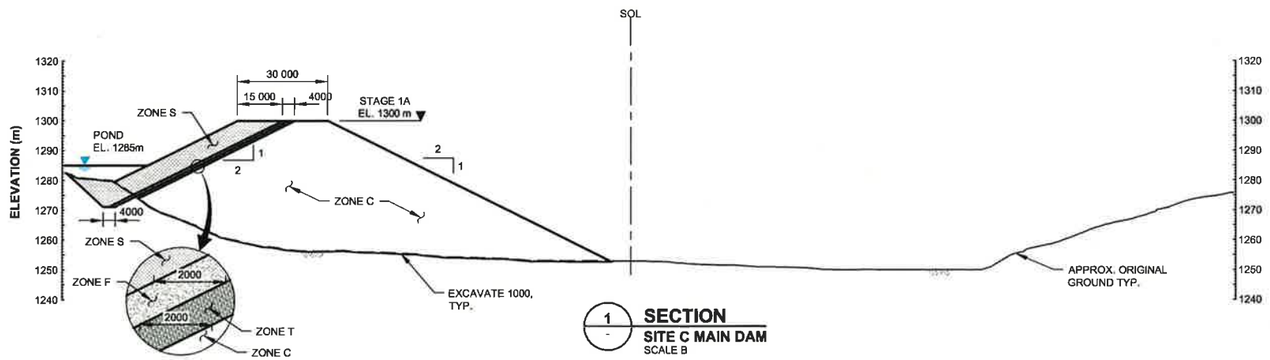
AREA
CLIENT DWG. NO.
DRAWING NO. D0115
REV. 0

SAVED: 03-Dec-13 10:08 AM PLOTTED: 03-Dec-13 10:26 AM USER: ABBAS NASIRI

CAD FILE: M:\1\01\00457\04\VA00457_04_D0115_REV0.DWG



PLAN
SITE C ELEVATION 1300 m
SCALE A



SECTION
SITE C MAIN DAM
SCALE B

ROAD VOLUMETRICS

ROAD	CUT (m^3)	FILL (m^3)	LENGTH (m)
KH1	217,200	163,100	1,259
KH2	754,800	535,400	6,636
KH3	100,900	68,300	1,581
KS1	240,800	477,500	3,927

ROAD GRADING

ROAD	WIDTH (m)	FROM	TO	LENGTH (m)	GRADE (%)
KH1	20	0+000	1+023	1,023	-9.7
KH1	20	1+023	1+259	236	-0.4
KH2	20	0+000	4+458	4,458	-5.4
KH2	20	4+458	6+636	2,178	-2.5
KH3	20	0+000	0+997	997	-5.7
KH3	20	0+997	1+581	584	-6.2
KS1	25	0+419	2+163	1,744	-1.2
KS1	25	2+163	4+346	2,183	-0.2

LEGEND:

- MINE WATER
- FRESH WATER
- EMBANKMENT FILL
- BORROW AREA (ZONE S & C)

NOTES:

1. CONTOUR INTERVAL IS 5 m.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. CHAINAGE FOR ROADS KH1 AND KH2 BEGINS AT SITE C LOCAL BORROW.
4. CHAINAGE FOR ROAD KH3 BEGINS AT INTERSECTION WITH ROAD KS1
5. CHAINAGE FOR ROAD KS1 BEGINS AT KP SCOPE CUT-OFF POINT AND IS PRECEDED BY AMEC ROAD AS7.

NOT FOR CONSTRUCTION

SCALE A: 20 10 0 20 40 60 80 100 m
SCALE A: 200 100 0 200 400 600 800 1000 m

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	03DEC13	ISSUED FOR USE	BG	EAM	DDF			

REF	NUMBER	TITLE

REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER — D. D. FONTAINE — # 36208 — BRITISH COLUMBIA — Dec 4, 2013

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APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.
PROJECT PHASE
FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	DDF	08NOV13
SCALE	PACKAGE CODE	DRN	AN	08NOV13
VARIES		CHK	BG	04DEC13
		APP	EAM	04DEC13

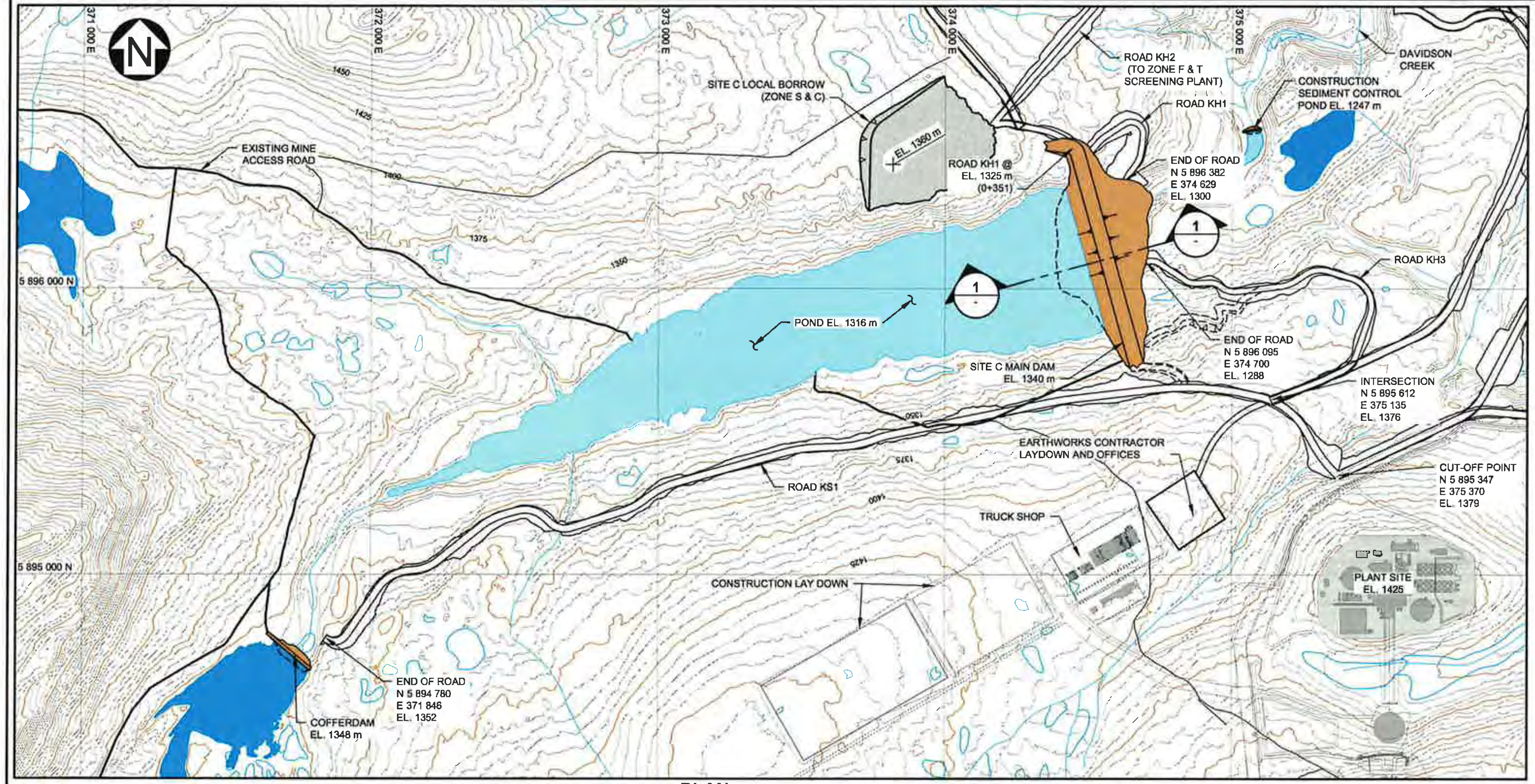
newgold

Knight Piésold CONSULTING

SUBJECT
TAILINGS STORAGE FACILITY
SITE C
YEAR –2 CONSTRUCTION PLAN

AREA
CLIENT DWG. NO.
DRAWING NO. D0140
REV. 0

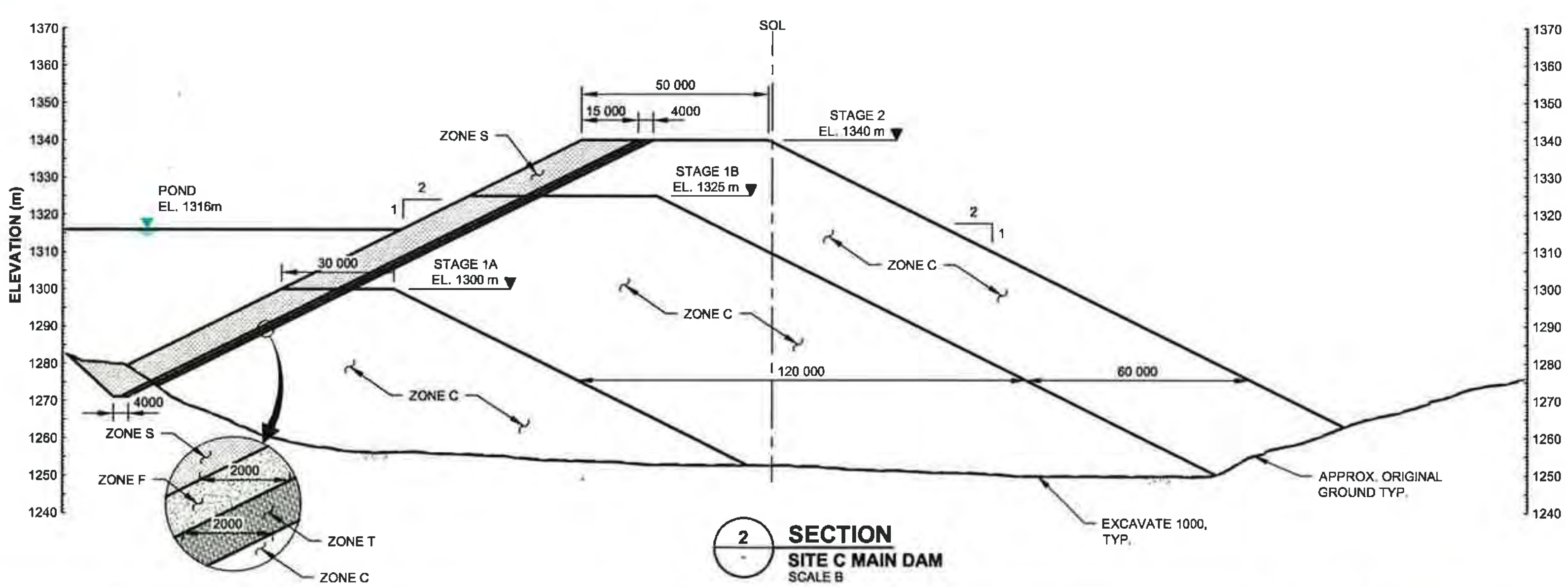
CAD FILE: M:\1\01\00457\06\A\CAD\DWG\D0140\D0140_R0.DWG
SAVED: 03-Dec-13 10:40 AM PLOTTED: 03-Dec-13 11:15 AM USER: ABBAS NASIRI



PLAN

SITE C ELEVATION 1340 m

SCALE A



2 SECTION

SITE C MAIN DAM

SCALE B

ROAD VOLUMETRICS			
ROAD	CUT (m^3)	FILL (m^3)	LENGTH (m)
KH1	217,200	163,100	1,259
KH2	754,800	535,400	6,636
KH3	100,900	68,300	1,581
KS1	240,800	477,500	3,927

ROAD GRADING					
ROAD	WIDTH (m)	FROM	TO	LENGTH (m)	GRADE (%)
KH1	20	0+000	0+351	351	-9.7
KH1	20	0+351	0+781	410	-9.7
KH2	20	0+000	4+458	4,458	-5.4
KH2	20	4+458	6+636	2,178	-2.5
KH3	20	0+000	0+977	977	-5.7
KH3	20	0+977	1+418	441	-6.2
KS1	25	0+419	2+163	1,744	-1.2
KS1	25	2+163	4+346	2,183	-0.2

LEGEND:

- MINE WATER
- FRESH WATER
- EMBANKMENT FILL
- BORROW AREA (ZONE S & C)

NOTES:

1. CONTOUR INTERVAL IS 5 m.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. CHAINAGE FOR ROADS KH1 AND KH2 BEGINS AT SITE C LOCAL BORROW.
4. CHAINAGE FOR ROAD KH3 BEGINS AT INTERSECTION WITH ROAD KS1
5. CHAINAGE FOR ROAD KS1 BEGINS AT KP SCOPE CUT-OFF POINT AND IS PRECEDED BY AMEC ROAD AS7.

NOT FOR CONSTRUCTION

SCALE A 20 10 0 20 40 60 80 100 m

SCALE A 200 100 0 200 400 600 800 1000 m

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP

REF	NUMBER	TITLE
	REFERENCES	

STAMP/SEAL: PROFESSIONAL ENGINEER, D. D. FONTAINE # 36208, Dec 4, 2013

APPROVED FOR ____

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	DDF	08NOV13
		DRN	AN	08NOV13
SCALE	PACKAGE CODE	CHK	RR	04DEC13
VARIES		APP	SRM	04DEC13

newgold

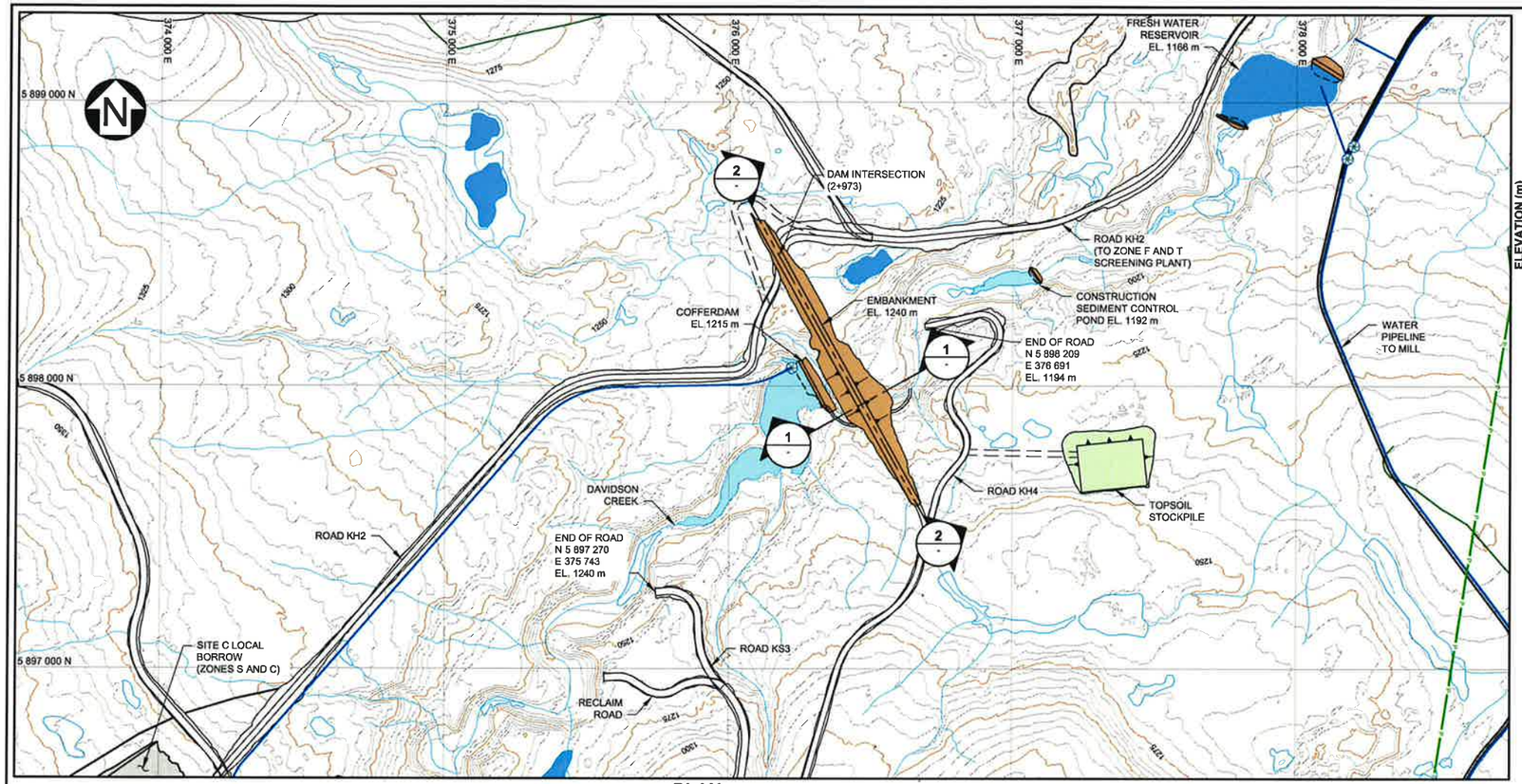
Knight Piésold CONSULTING

SUBJECT: TAILINGS STORAGE FACILITY SITE C YEAR -1 CONSTRUCTION PLAN

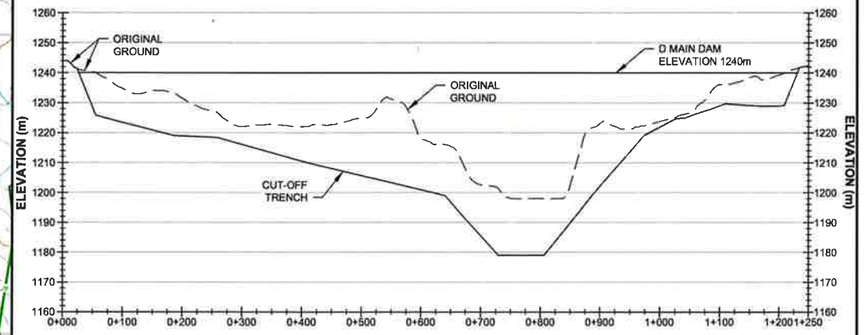
AREA

CLIENT DWG. NO.

DRAWING NO. D0150 REV. 0



PLAN
SITE D ELEVATION 1240 m
SCALE A

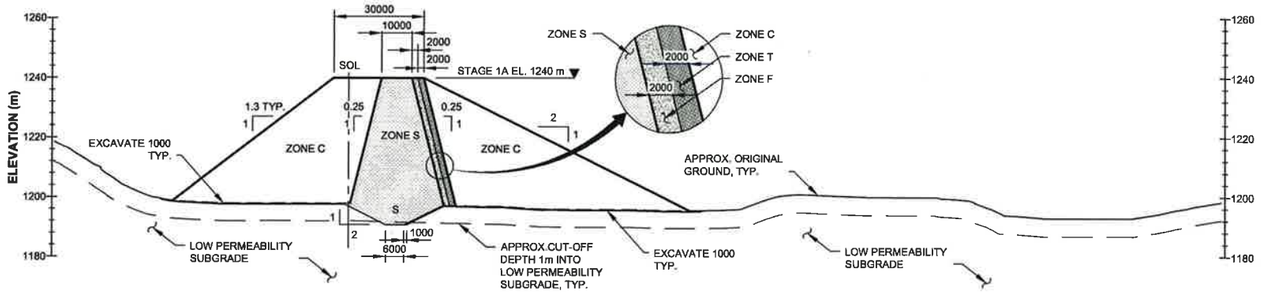


2 SECTION
SITE D MAIN DAM PROFILE
HORIZONTAL: SCALE C
VERTICAL: SCALE D

ROAD GRADING					
ROAD	WIDTH (m)	FROM	TO	LENGTH (m)	GRADE (%)
KH2	20	0+000	2+178	2,178	-5.39
KH2	20	2+178	2+973	795	-2.46
KH2	20	2+973	6+636	3,663	-2.46

LEGEND:
- MINE WATER
- FRESH WATER
- EMBANKMENT FILL
- TOPSOIL

NOTES:
1. CONTOUR INTERVAL IS 5 m.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. CHAINAGE FOR ROAD KH2 BEGINS AT SITE C LOCAL BORROW.



1 SECTION
SITE D MAIN DAM
SCALE B

NOT FOR CONSTRUCTION

20 10 0 20 40 60 80 100 m
SCALE B
200 100 0 200 400 600 800 1000 m
SCALE A

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
D. D. FONTAINE
36208
Dec 4, 2013

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CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.
PROJECT PHASE
FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	DDF	08NOV13
SCALE	PACKAGE CODE	DRN	AN	08NOV13
VARIES		CHK	BB	04DEC13
		APP	[illegible]	04DEC13

newgold

Knight Piésold CONSULTING

SUBJECT
TAILINGS STORAGE FACILITY
SITE D
YEAR –1 CONSTRUCTION PLAN

AREA
CLIENT DWG. NO.
DRAWING NO. D0170
REV. 0

DWG FILE: VA101\01\204357\08\VA\ACAD\DWGS\D0170\D0170_R0.DWG
SAVED: 03-Dec-13 11:04 PLOTTED: 03-Dec-13 11:15 AM USER: ABBAS NASIRI

newgold

BLACKWATER PROJECT
Proposed Water Supply Pipeline

Legend

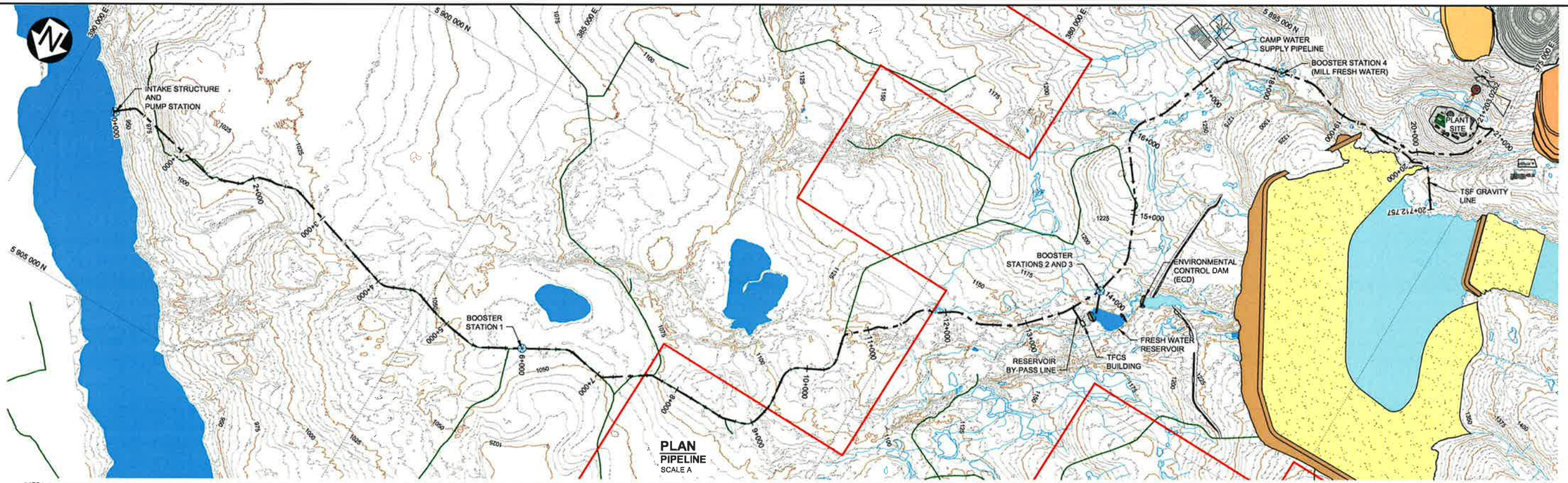
- Feature Point
- Bridge
- Culvert
- Km Marker
- Default "S4" Stream
- Bridge/Arch Required
- New Road
- Section 1
- Section 2
- Section 3
- Section 4
- Airstrip Access Road
- Permanent Access Road
- Proposed Transmission Line
- Proposed Airstrip
- Proposed Water Supply Pipeline
- Gravel Road
- Rough Road
- Stream
- Contours_5m
- Existing Camp
- Lake
- Wetland
- Embankment Fill
- Tailings Beach
- Pond
- Existing Gravel Pit
- Potential Gravel Pit

20k Mapsheets: 93F
Date: 7/17/2013
Projection: NAD 1983 UTM Zone 10N
Scale: 1:20,000
Author: tkwitkoski
Last Modified By: tkwitkoski
Checked By: EK
Revision #:

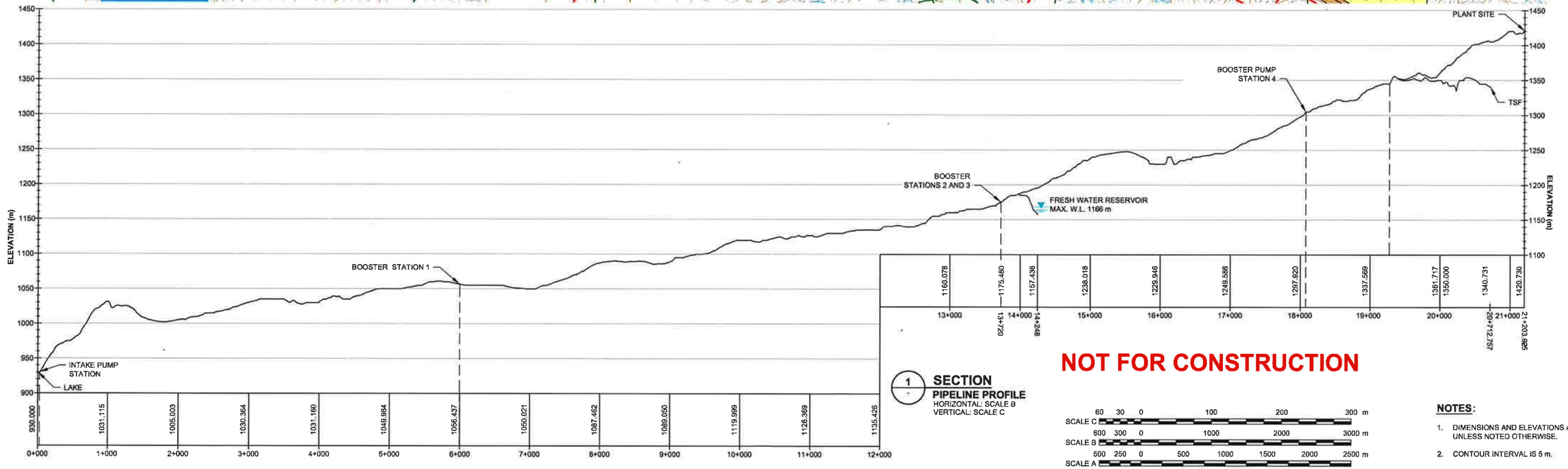
0 250 500 1,000
Meters

Allnorth

Path: C:\11-PG-0148-Blackwater Project\24 GIS\24.30 Mining\ProposedWaterSupplyPipeline_D.mxd



PLAN
PIPELINE
SCALE A



1 SECTION
PIPELINE PROFILE
HORIZONTAL: SCALE B
VERTICAL: SCALE C

SCALE C: 60 30 0 100 200 300 m
SCALE B: 600 300 0 1000 2000 3000 m
SCALE A: 500 250 0 500 1000 1500 2000 2500 m

NOT FOR CONSTRUCTION

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. CONTOUR INTERVAL IS 5 m.

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — D. D. FONTAINE — # 36208 — Dec 4, 2013

APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	RSS	08NOV13
SCALE: VARIES	PACKAGE CODE	DRN	AN	08NOV13
		CHK	DDF	04DEC13
		APP	RJM	04DEC13

newgold

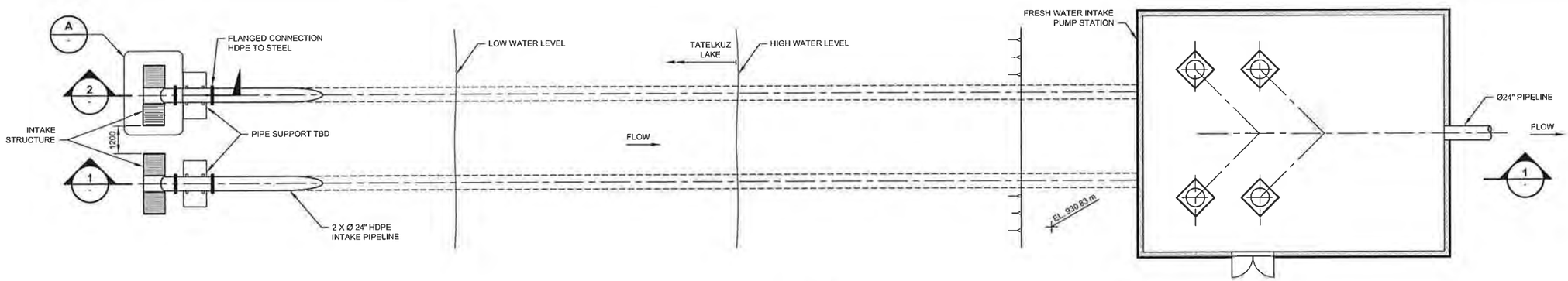
Knight Piésold CONSULTING

SUBJECT: FRESH WATER SUPPLY SYSTEM
FRESH WATER SUPPLY PIPELINE
GENERAL ARRANGEMENT AND PROFILE

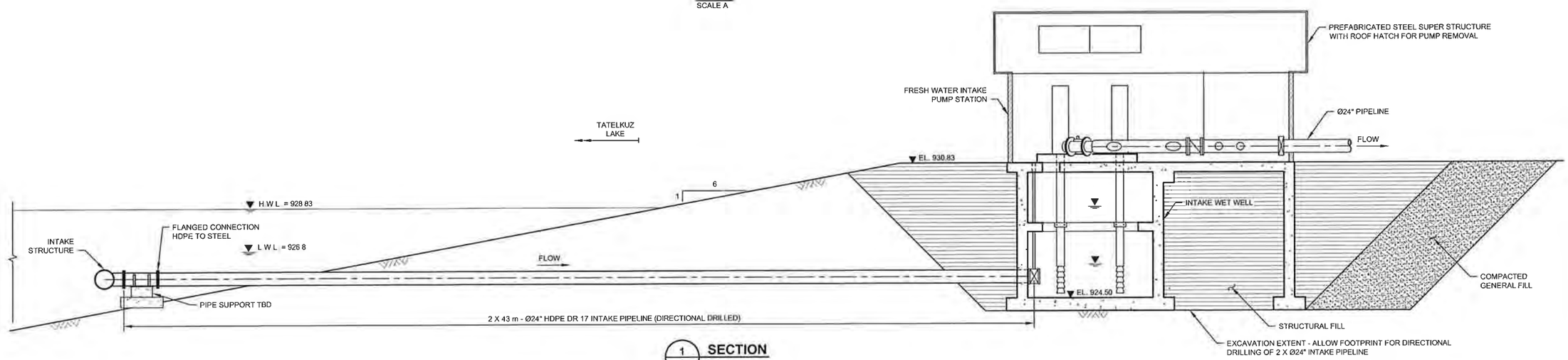
AREA:
CLIENT DWG. NO.:
DRAWING NO.: D0200
REV.: 0

SAVED: 03-Dec-13 12:00 PM PLOTTED: 03-Dec-13 1:35 PM USER: ABBAS NASIRI

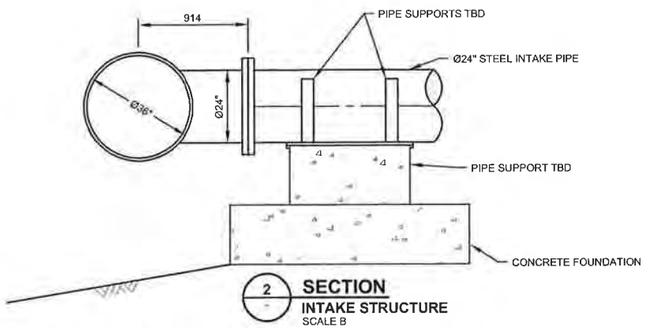
CAD FILE: M:\1101\00457\VA101-457_DWGS\00200\00200_00.DWG



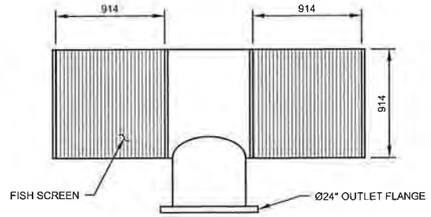
PLAN
SCALE A



1 **SECTION**
SCALE A



2 **SECTION**
INTAKE STRUCTURE
SCALE B



A **DETAIL**
INTAKE STRUCTURE - PLAN
SCALE B

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE
2. INTAKE PUMP STATION SIZING FOR FOUR PEERLESS PUMPS
3. ALL FLANGES TO MEET ASTM A516 GRADE 70 CLASS 150, UNLESS NOTED OTHERWISE

NOT FOR CONSTRUCTION

SCALE B 0.5 0.25 0 0.5 1.0 1.5 2.0 2.5 m

SCALE A 2 1 0 2 4 6 8 10 m

REV	DD/MM/YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	04/DEC/13	ISSUED FOR USE	RSS	AN	DDF	RM		

REV	DD/MM/YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER — D. D. FONTAINE # 36208 — Dec 4, 2013

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APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DD/MM/YY
VA101-457/6		DES	RSS	20NOV13
SCALE: VARIES	PACKAGE CODE	DRN	AN	20NOV13
		CHK	DDF	04DEC13
		APP	RM	04DEC13

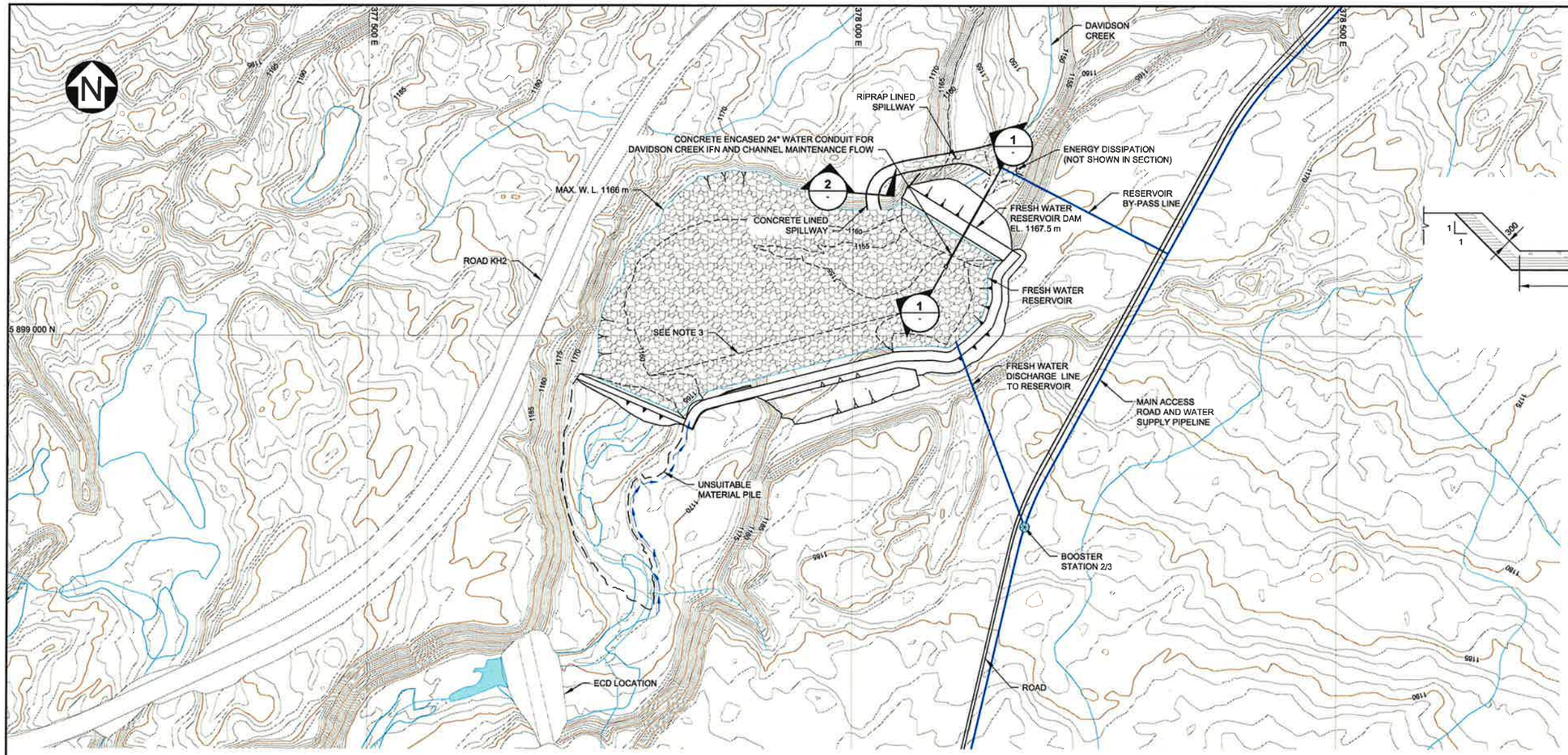
newgold

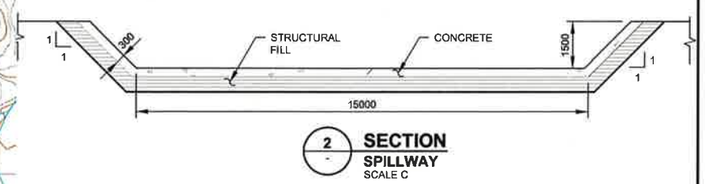
Knight Piésold CONSULTING

SUBJECT: FRESH WATER SUPPLY SYSTEM INTAKE STRUCTURE PLAN AND SECTION

AREA
CLIENT DWG. NO.
DRAWING NO. D0202 — REV. 0

SAVED: 03-Dec-13 1:07 PM PLOTTED: 03-Dec-13 1:35 PM USER: ABBAS HASEN





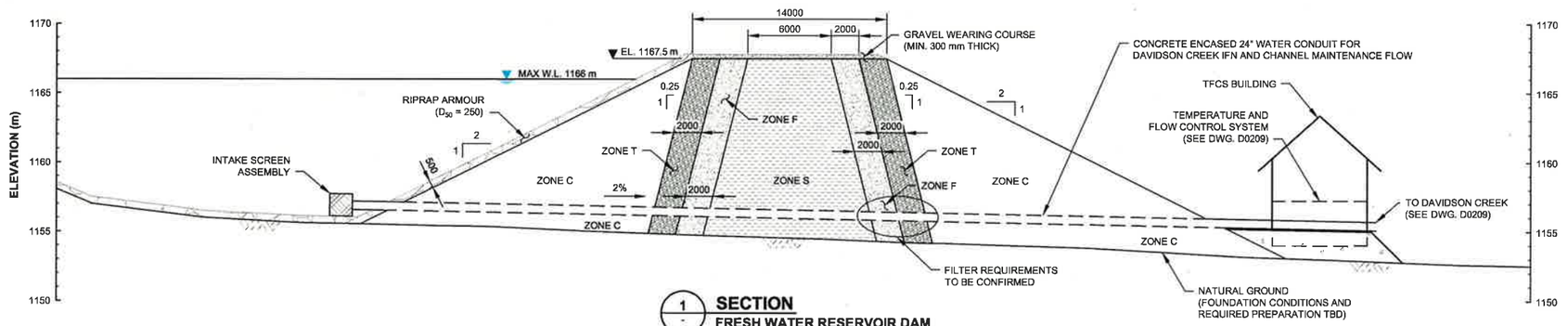
2 - **SECTION**
SPILLWAY
SCALE C

LEGEND:

- RIPRAP
- PUMPSTATION
- FRESH WATER SUPPLY PIPELINE
- DIVERSION CHANNEL

NOTES:

1. CONTOUR INTERVAL IS 1 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. EXCAVATE RESERVOIR TO CREATE STORAGE CAPACITY. EXCAVATED MATERIAL WILL BE USED AS DAM FILL OR SPOILED IN THE UNSUITABLE MATERIAL PILE.



1 - **SECTION**
FRESH WATER RESERVOIR DAM
SCALE B

NOT FOR CONSTRUCTION

SCALE C: 2 1 0 2 4 6 8 10 m
SCALE B: 4 2 0 4 8 12 16 20 m
SCALE A: 50 25 0 50 100 150 200 250 m

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	04DEC13	ISSUED FOR USE	DDF	AN	RR			

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER — D. D. FONTAINE # 36208 — Dec 4, 2013

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APPROVED FOR _____
CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: FEASIBILITY STUDY

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
VA101-457/6		DES	DDF	20NOV13
SCALE	PACKAGE CODE	DRN	AN	20NOV13
VARIES		CHK	RR	04DEC13
		APP	[illegible]	04DEC13

newgold

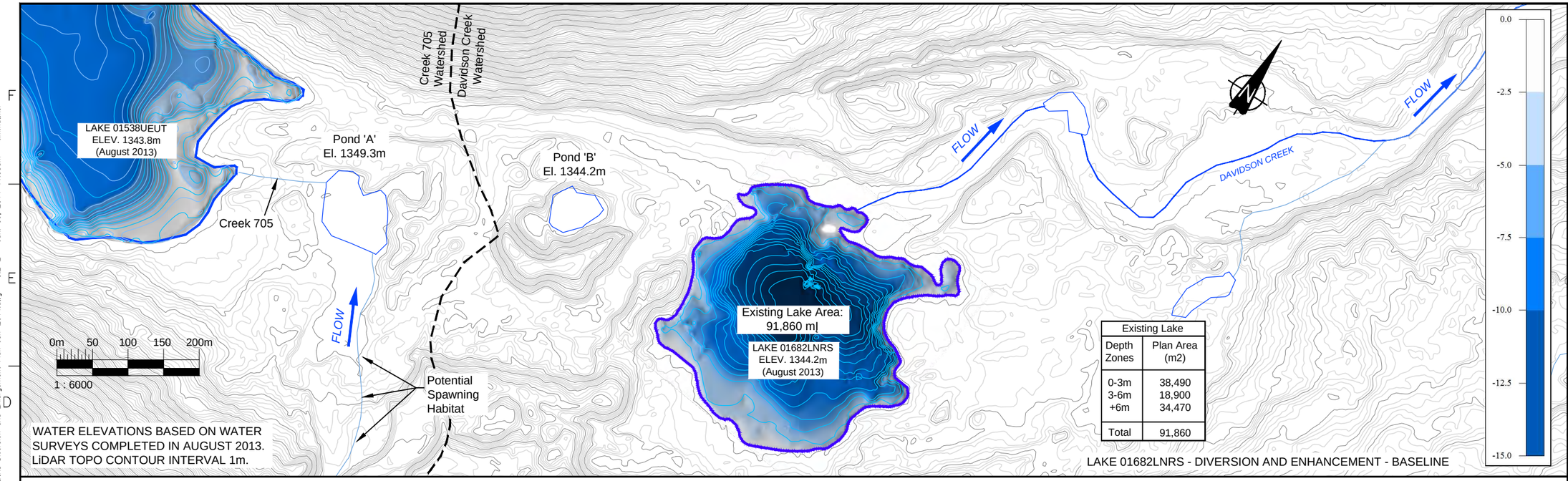
SUBJECT: FRESH WATER SUPPLY SYSTEM
FRESH WATER RESERVOIR
PLAN AND SECTION

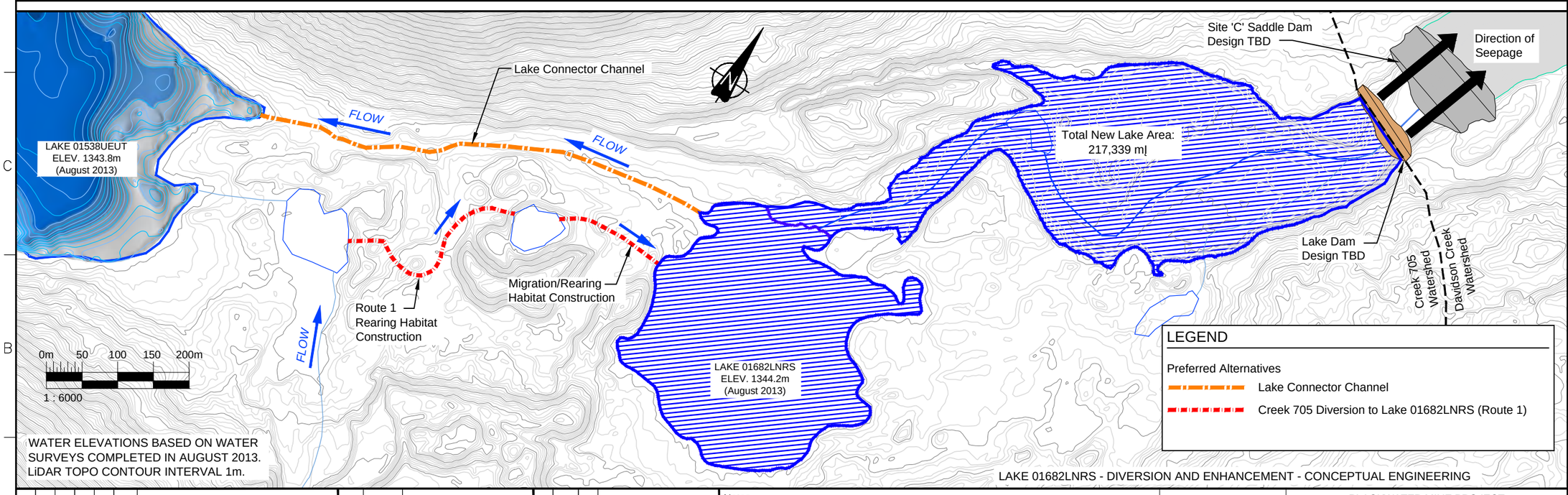
Knight Piésold CONSULTING

AREA
CLIENT DWG. NO.
DRAWING NO. D0208
REV. 0

CAD FILE: \\VA101\DOCS\PROJECTS\VA101-457\06\VA101-457_D0208_R0.DWG

SAVED: 03-Dec-13 4:09 PLOTTED: 03-Dec-13 4:09 PM USER: ABBAS NAS PM





REV	DSN	CHK	DR	APP	D/M/Y	REVISION
1			TH	BM	17/03/13	ISSUED FOR DRAFT REPORT

REF	NUMBER	REFERENCES

ISS	D/M/Y	APP	ISSUED FOR

Notes

1. Conceptual engineering detail only. Target water elevations of enlarged lake shall be based on existing mean annual water elevation of Lake 01682LNRS.
2. Lake Dam and Site 'C' Saddle Dam to be deteremined (TBD) by Knight and Piesold Ltd.

Data Sources:

1. Bathymetric lake surveys of existing lake performed by Ecofor, 2011 (Amec 2011-2012 Baseline Report - Fish and Aquatic Resources).
2. Freshwater Atlas Streams and Lakes - BC Government GEOBC Data Distribution.

newgold

BLACKWATER MINE PROJECT

Lake 01682LNRS Diversion and Enlargement Plan

FILE NO: VE52277			DATE: JANUARY 2014
PROJECTION: UTM Zone 10	DATUM: NAD 83		FIGURE:
JOB NO: VE52277	REVISION NO: 1		

N:\Projects\52000\VE52200\VE52277 - New Gold - Blackwater EA 2013\7000 Compensation\Fish Habitat\04 Drawings and Maps\CAD Folder\N5.2-2 Lake-01682LNRS Diversion and Enlargement Plan Jan-2014.dwg - 5.2-2 - Jan. 09, 2014 11:03am - tim.hawker

Appendix C

Blackwater Gold Project Photos of Non-minor Waters and Aerial Tour of Davidson Creek

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Appendix C. Blackwater Gold Project Photos of Non-minor Waters and Aerial Tour of Davidson Creek

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Appendix C. Blackwater Gold Project Photos of Non-minor Waters and Aerial Tour of Davidson Creek

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Plate #	Reach	# Photos
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5	Davidson Ck. Reach 9	2
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Plate 1. Davidson Ck. Reach 13: headwater Lake 01682LNRS and wetland area; August 2011.

Plate 2. Davidson Ck. Reach 12: Cobble boulder substrate, headwater lake outflow; August 2011.

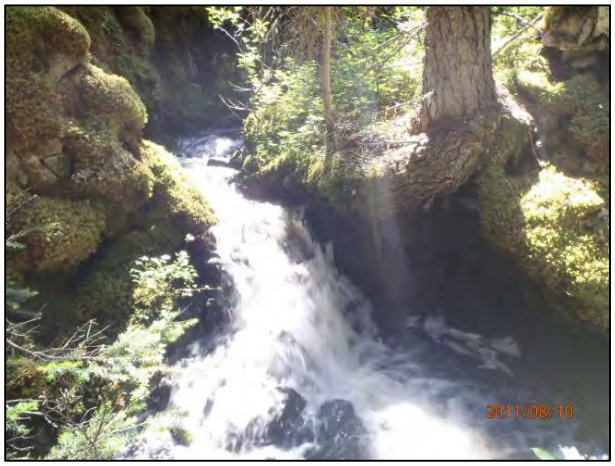

Plate 3. Davidson Ck. Reach 11: Upstream steep bedrock cascade (left) and a heavily vegetated glide (right); August 2011.

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Plate 6. Davidson Ck. Reach 8: Log jam (left) and large woody debris (right); August 2011.

Plate 7. Davidson Ck. Reach 7.1: Upstream shallow riffle with fallen log (left) and downstream boulder cobble substrate (right); August 2011.

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22	TL-937	Transmission Line Aerial Cable Crossing	Stellako River	1
23	TL-958	Transmission Line Aerial Cable Crossing	Turtle Creek	1
24	TL-969	Transmission Line Aerial Cable Crossing	Big Bend Creek	1
25	TL-973	Transmission Line Aerial Cable Crossing	Big Bend Creek	1
26	TL-1021	Transmission Line Aerial Cable Crossing	Tahultzu Creek	1
27	TL-1057	Transmission Line Aerial Cable Crossing	Unnamed creek	1
28	TL-1058	Transmission Line Aerial Cable Crossing	Unnamed creek	1
29	TL-1064	Transmission Line Aerial Cable Crossing	Greer Creek	1
30	TL-1065	Transmission Line Aerial Cable Crossing	Nechako River	1
31	TL-1078	Transmission Line Aerial Cable Crossing	Chedakuz Creek	1
32	MR-002	Mills Ranch Transmission Line Re-route Alternative Aerial Cable Crossing	Unnamed creek	1
33	SR-003	Stellako Transmission Line Re-route Alternative Aerial Cable Crossing	Stellako River	1
34	AP-004	Mine Access Road Bridge	Davidson Creek	1
35	AP-007	Mine Access Road Bridge	Turtle Creek	1
36	FSS-003	Water Pipeline Crossing	Unnamed creek	1
37	FSS-005	Water Pipeline Crossing	Ck. 704454	
38	FSS-008	Water Pipeline Crossing	Unnamed creek	1
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Plate 19. Davidson Ck. TL-004 Transmission line crossing, blowdown, August 9, 2012.

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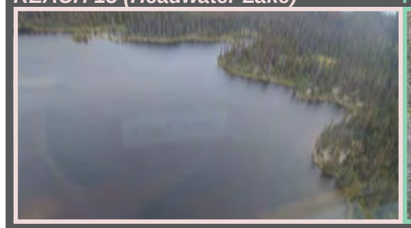
Plate 39. Tatelkuz Lake FSS-000 intake site. (Pending)

REACH 13 (Headwater Lake)



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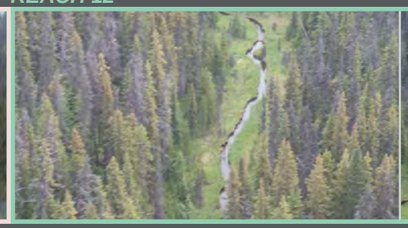

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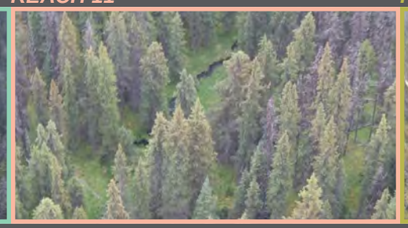


REACH 10

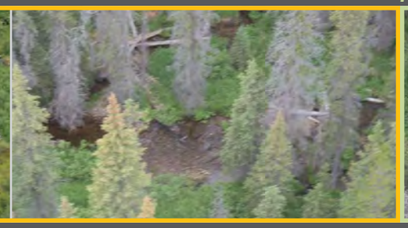
REACH 9

REACH 9 (continued)

REACH 8

REACH 7.1

REACH 7



REACH 6

REACH 6 (continued)

REACH 5

REACH 5 (continued)

REACH 4

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Figure 1

Blackwater Gold Project Aerial Tour of Davidson Creek, Reaches 13 to 4; July 2013

Appendix D

Blackwater Gold Project Minor Works, Waters and Flow Assessment

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APPENDIX D. BLACKWATER GOLD PROJECT MINOR WORKS, WATERS AND FLOW ASSESSMENT

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Acronyms and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Application/EIS	Application for an Environmental Assessment Certificate / Environmental Impact Statement
FSR	Forest Service Road
GIS	geographic information systems
HWM	high water mark
IDF	Inflow design flood
LSA	Local Study Area
MWWO	Minor Works and Waters Order
NWPA	*Navigable Water Protection Act*
NPA	Navigation Protection Act
NWPP	Navigable Waters Protection Program
NPP	Navigation Protection Program
ROC	records of contact
ROW	right-of-way
TC	Transport Canada
TSF	tailing storage facility
UTM	Universal Transverse Mercator
UWR	ungulate winter range
WSC	Watershed Code
%	percent
>	greater than
<	less than
cm	centimetre
ha	hectare
km	kilometre
km^2	square kilometre
m	metre

1. Introduction

New Gold Inc. (New Gold) is proposing to develop the Blackwater Gold Project (the Project) in order to extract 507,000 oz of gold and 2,039,000 oz of silver during its 17 year life from the Blackwater ore deposit (AMEC 2012). The Project mine site and proposed ancillary infrastructure (including open pit, a mine access road, an ore processing facility, a tailings storage facility (TSF), waste rock piles, a water supply system, an air strip, and fish habitat compensation sites) lies in central British Columbia (BC), in the Cariboo Regional District, approximately 160 kilometers (km) southwest of Prince George and 446 km northeast of Vancouver. The Project TSF is proposed to be located in the upper reaches of the Davidson Creek watershed. The TSF will consist of an engineered reservoir in which the deposition of mining tailings will be contained between two embankments (dams) (BC MOE 2009). The Project also consists of off-site components located in the Bulkey-Nechako Regional District that consist of upgrades along Kluskus-Ootsa Forest Service Road (FSR) and a transmission line.

There is a public right to transit navigable waters in Canada that is protected under common law. This right to navigation can only be restricted by an Act of Parliament, such as the former *Navigable Waters Protection Act* (NWPA; 1985). The NWPA was subject to amendments in the *Jobs and Growth Act (2012)*, including restricting waters automatically covered under the Act for approvals to a scheduled list of major waters in Canada, and repealing the NWPA to replace it with the *Navigation Protection Act* (NPA; Transport Canada 2014b). The NPA recently came into effect, replacing the NWPA on April 1, 2014. Project works and waters were originally screened against the Minor Works and Waters Order (MWWO; 2009) criteria applicable under the NWPA. Criteria to determine minor works have been amended under the Minor Works Order that was issued under the authority of the NPA in April 2014 (Department of Transport 2014); the minor works screening in this report has been updated to be concordant with the updated requirements. The original minor waters assessment per the old MWWO physical criteria has been maintained in this report in order to inform an assessment of navigability in the main report based on physical capacity to support navigation. Field observations (including NVC reaches) that provide baseline data supporting the assessment of minor works and waters for that Project are listed in Appendix A, site maps and engineering drawings are in Appendix B, and photos of waters are in Appendix C.

2. Regulatory Context

2.1 MINOR WORKS

Works for the Project (Sections 1.4 and 2.3) may include culverts, bridges, transmission lines, and pipelines that cross waterways; water intakes for the freshwater supply system; and a series of works such as dams and diversion structures in the upper reaches of Davidson Creek to create the TSF and divert water around open pit and waste dumps, to establish fish habitat compensation sites, and manage water flow levels. The screening of works conducted for the Project was originally conducted to match the criteria set forth in the previous MWWO (2009). Generally, under the MWWO (2009), those works classified as "minor" were considered to present neither threat to the ongoing safety of, nor access to, navigation. Under the NPA, the MWWO is no longer in force, so this assessment has been revised to be concordant with the criteria in the updated Minor Works Order (Department of Transport 2014). There is no update to criteria to designate minor classes of waters under the NPA; therefore, the old assessment under the MWWO for minor waters is maintained in this report as the data is deemed as applicable to the determination of physical navigability using jurisprudence criteria. Minor waters identified in this screening are still considered to be physically incapable to support navigation.

2.1.1.1 Minor Works Order Criteria

The NPA Minor Works Order criteria (Department of Transport 2014; Transport Canada 2014a) for Project aerial cables, pipelines, outfalls, and water intakes works differ from those previously used under the MWWO (2009), and so the minor works screening in this report has been updated to comply with the amended Minor Works Order. Under the Minor Works Order, classes of Project works found to be minor per the criteria outlined below are considered "designated works", that may proceed without Notice under the NPA, as long as they comply with the requirements set out under the Minor Works Order (Transport Canada 2014c).

<u>Aerial Cable Criteria</u>

Under s.6 of the Minor Works Order (Department of Transport 2014), aerial cables that are over or across a navigable water and that are only for power or telecommunication purposes, and the associated structures and equipment, are established as a designated class (i.e., minor) of works for the purposes of subsection 5.1(1) of the NPA if:

(a) the width of the navigable water at the site of the crossing is less than 30 m when measured from the ordinary high-water mark on one side of the navigable water to the ordinary high-water mark on the other side;

(b) the works are not over or across a lake or tidal waters;

(c) the works are not over or across a canal that is accessible to the public;

(d) the works do not include towers or poles within the area between the ordinary high-water marks on each side of the navigable water; and

(e) the works meet the requirements of section 5.3.3.2 of *Overhead Systems*, CAN/CSAC22.3 No. 1-10, as amended from time to time.

Criteria for Outfalls and Water Intakes

Under s.11 of the Minor Works Order (Department of Transport 2014), outfalls and water intakes qualify as a designated class of works for the purposes of subsection 5.1(1) of the NPA if:

(a) the works do not include a crib or other outfall or intake structure, such as a fish screen, an anchor, a collar or a weight, that extends vertically above the bed of the navigable water more than
    i. in the case of a navigable water of less than 15 m in depth when measured from the ordinary high-water mark, 5% of the depth of the water when measured from the ordinary high-water mark, or
    ii. in any other case, 1 m;
(b) the works do not alter the level or flow of the navigable water;
(c) in the case of a charted navigable water, the works are not within 30 m of a navigation channel; and
(d) the works are not associated with a dam, weir or headpond, including a proposed dam, weir or headpond.

Pipeline Criteria

Under s.8 of the Minor Works Order (Department of Transport 2014), pipelines that are buried under the bed of a navigable water and that are built or placed using a trenched method are established as a designated class of works for the purposes of subsection 5.1(1) of the NPA if:

(a) the width of the navigable water at the site of the crossing is less than 50 m when measured from the ordinary high-water mark on one side of the navigable water to the ordinary high-water mark on the other side; and
(b) the construction or placement of the works is completed within two weeks after the day on which construction or placement of the works started.

In addition to the above criteria, under s.9 of the Minor Works Order (Department of Transport 2014), pipelines that are attached to an existing work that was approved under the NPA, or is referred to in subsection 4(1) or (2) or section 8 of the NPA, are established as a class of works for the purposes of subsection 5.1(1) of the Act if the works do not increase the interference with navigation caused by the existing work.

2.2 MINOR WATERS

The screening of waters conducted for the Project was originally conducted to match the criteria set forth in the previous MWWO (2009). Generally, under the previous MWWO (2009), waters classified as “minor” are typically not navigable due to their restrictive physical characteristics which would preclude the ability to navigate them. Under the NPA, the MWWO is no longer in force, and there is no update to criteria to designate minor classes of waters under the NPA. However, the old assessment under the MWWO for minor waters is maintained in this report as the data and analysis is still deemed applicable to the determination of physical navigability using jurisprudence criteria. Minor waters identified in this screening are considered to be physically incapable to support navigation.

2.2.1.1 Minor Waters Criteria

The technical criteria by which minor classes of waters can be identified are set forth in the previous MWWO (2009). The related Minor Waters Users Guide (Transport Canada 2010) presents the criteria and methodology required to assess minor waters through the two-stage review process outlined below.

Initial Review

If **either** of the following conditions are met, a watercourse is considered a minor navigable water:

- A watercourse less than (<) 1.2 m wide, measured at the high-water mark; or
- A watercourse less than (<) 0.3 m deep, measured at the high-water mark.

Secondary Review

A waterway with an average high-water width along a 200 m section of 1.20 m but not more than 3.00 m (1.20 m ≤ width ≤ 3.00 m) can be considered a minor navigable water if **one** of the following four conditions is **also** met:

- channel depth is less than or equal to (≤) 0.6 m, measured at the high-water mark;
- channel gradient is greater than (>) 4%;
- sinuosity ratio is greater than (>) 2; or
- there are three or more natural obstacles present.

Waterways with an average high-water width over 3.0 m wide along a 200 m section *cannot* be classified as minor under the MWWO.

3. Assessment

In this section, predicted flow changes to waters as a result of the Project are presented, Project works are assessed against the amended Minor Works Order under the NPA (Department of Transport 2014), and waters affected by the Project are screened using the previous MWWO (2009) criteria (Sections 1.2.1.1 and 2.5.1) to identify minor and non-minor waters. Minor waters are screened out of further navigability assessment as not meeting basic physical characteristics to support navigation on waters where there is no established use for navigation. The remaining non-minor waters are identified for the Project as requiring further assessment of navigability based on jurisprudence criteria. The exception is for Davidson Creek and other reaches affected by the TSF, to which the applicability of NPA s.22 prohibited activities may apply; waters found to be minor and non-minor in this assessment will be screened into further assessment using jurisprudence criteria. Waters with identified flow effects from the Project as described in Section 3.1.1.3 are also included in the MWWO screening in Section 3.1.

3.1 ASSESSMENT OF ON-SITE WORKS AND FLOW CHANGES

The on-site Project MWWO (2009) screening (based on criteria listed in Section 2.1.1.1), was conducted for waters interacting directly with works on the Project mine-site, as well as for water reaches downstream of the mine site that do not have proposed works that will directly affect them, but are subject to predicted downstream flow changes (Section 3.1) that may affect navigability. Reaches affected by planned fish habitat compensation west of the TSF—either directly or indirectly through flow changes downstream—are also considered in this section. Discreet works that are part of linear Project components that reach off-site (i.e., MAR, transmission line, and freshwater supply pipeline crossings) are assessed in Section 3.1.2.

3.1.1.1 Works at the Mine Site

Works at the mine site are distinct from those for off-site linear components. Within the mine site footprint, none of the works were deemed to be minor according to MWWO (2009) minor works criteria under the NWPA, and none meet the criteria under the Minor Works Order (Department of Transport 2014) under the NPA either. Some works (such as dams) will block access to waterways, and other works (such as waste dumps) will eliminate original waterway channels, which will substantively affect these channels. There are also discreet Project components and facilities in the Project mine site—such as those that make up the TSF—that may be considered as a connected single work under s.5(5) of the NPA. The Project TSF fits the general definition for a tailings facility being an artificial reservoir created by one or more embankments/dams (BC MOE 2009); therefore, the dams bounding the TSF and its interior structures are considered the main TSF "works" that might interact with potential navigation on the waterway. The TSF will be a monitored and controlled impoundment with no public access, since access to the entire mine site will be restricted for safety as required by the BC *Mines Act* (1996), and access to the TSF will be prohibited. Since deposition of tailings for the Project will be into the engineered and controlled TSF enclosure, not into a natural and open water body, the tailings material itself will not have the capacity to directly interact with potential navigation intersected waters as well as downstream waters.

Table 3.1-1 provides the Proponent's MWWO (2009) screening for on-site Project works and affected waters, as well as downstream reaches, and upstream reaches affected by fish habitat compensation. The Project TSF interacts directly with reaches 8 and 9 of Davidson Creek, and reaches 1, 2 and 3 of Creek 704454, that have been deemed to be ***non-minor***. Dams and other works downstream of the TSF (such as those to create the freshwater reservoir), interact with reaches 6 to 8 of Davidson Creek,

which have also been found to be ***non-minor***. The remaining reaches of Davidson Creek (10 and 11) and its tributaries intersecting with the TSF and other components at the mine site are deemed to be ***minor*** waters through either the first or secondary review tests, as indicated in Table 3.1-1. All of the reaches of Davidson creek, including those deemed as minor, are further assessed for navigability based on common law criteria, due to the potential applicability of s.(22) of the NWPA (1985) to Davidson (Section 2.1).

3.1.1.2 Summary of On-site Assessment

Figure 3.1-1 illustrates the results of the MWWO minor waters screening, indicating reaches found to be minor or non-minor in green and red respectively. Photos taken during field observations along reaches of Davidson Creek are provided in Plates 1 to 15 (Appendix C).

As summarized in Table 3.1-2, 54 reaches in total were assessed (36 directly affected by mine site works, 15 downstream of works and subject to flow changes, and 3 regarding proposed fish habitat compensation sites). Of the 36 reaches directly affected by mine site works, 28 have been deemed ***minor*** (16 through the first test and 12 through the second test), leaving 8 as ***non-minor***. These 8 reaches of Davidson Creek and Creek 704454 listed in Table 3.1-2 will be assessed further for navigability using jurisprudence criteria. While most of the reaches within the mine site have been found to be minor waters, downstream of the mine site, of the 15 reaches assessed that may be subject to flow changes of the Project, two were found to be ***minor*** while 13 were found to be ***non-minor***. Of these reach 15 of Chedakuz Creek and reaches 1-5 (6 total) will be assessed using jurisprudence criteria due to being downstream of the TSF and potential applicability of s.22 to these reaches. Regarding the two upper reaches of Davidson Creek and upper Lake 01538EEUT of Creek 705 that will be affected by fish habitat compensation, all three reaches were found to be ***non-minor***, so these will also be assessed per jurisprudence criteria for navigability. In addition, two reaches (10 and 11) of Davidson deemed to be minor waters per MWWO criteria will also be scoped into the jurisprudence assessment due to potential applicability of s.22 of the NPA to these reaches due to interaction with the TSF footprint. In total, 19 waters from the on-site assessment in this report will be assessed further using jurisprudence criteria.

3.1.1.3 Flow Considerations

The Project will affect flow of some waters from on-site mining activities and planned fish habitat compensation. Some Project works (i.e. open pit and water diversions) will lead to flow changes within and downstream of a waterway, so downstream reaches (such as Chedakuz Creek) that are not directly affected by Project works, but subject to potential flow changes, have been included in the minor waters screening assessment. Activities during the life of the Blackwater Project are expected to affect streamflows in Davidson Creek, Creek 661, Creek 705, and Chedakuz Creek. An assessment of hydrological parameters for these catchments was conducted by Knight Piésold Consulting (Knight Piésold) (Knight Piésold Ltd. 2013). Their results of predicted average annual flow changes are summarized in Tables 3.1-3 to 3.1-6. These tables include assessed flow changes for sub-catchment nodes for the four catchments. Predicted flow changes are also presented in terms of change in level (m) in Tables 3.1-7 to 3.1-10, based on stage data derived from 2012 rating equations presented in Table 3.1-11. Predicted changes to water levels in Tatelkuz Lake are presented in Table 3.1-12. The assessment of any potential effects to navigational safety and access on navigable waters as a result of these predicted flow changes is addressed in the Application/EIS navigation effects assessment.

Table 3.1-1. Stream Crossing and Reach Minor Works and Waters Assessment within and Downstream of Project Footprint

Stream Information							Works Evaluation			Waters Evaluation				
New Site ID	Waterbody	Reach	UTM	Latitude/ Longitude	Impacted Stream Length (m)	Photo Plate No.[1]	Type of Work	Type of Interaction	Exempt as Minor Works	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Blockages[2]	Exempt as Minor Waters
Reaches Directly Affected by Works in the Mine Site Footprint														
7	Davidson Ck.	reach 6	378203 E 5899307 N	53.2291°N 124.8246°W	1804	9	Fresh Water Reservoir Dam; Fresh Water Reservoir	Dam will block access; reservoir will partially eliminate bed and receive diverted water	No	5.19	0.5	0.6	1	No
8	Davidson Ck.	reach 7	377998 E 5899063 N	53.2268°N 124.8276°W	232	8	Fresh Water Reservoir	Bed eliminated	No	5.08	0.45	2.1	1	No
9	Davidson Ck.	reach 7.1	377728 E 5898790 N	53.2243°N 124.8315°W	788	7	Environmental Control Dam (ECD); Fresh Water Reservoir	Bed eliminated	No	6.44	0.54	2.1	2	No
10	Davidson Ck.	reach 8	377343 E 5898429 N	53.221°N 124.8372°W	953	6	ECD; Sediment Control Dam and Seepage Collection Trench	Bed partially eliminated; receives diverted water	No	6.9	0.65	1.9	1	No
11	Davidson Ck.	reach 9	376196 E 5897820 N	53.2152°N 124.8541°W	1116	5	Tailing Storage Facility (TSF) Site D Main Dam; TSF	Bed eliminated	No	5.19	0.42	1.8	1	No
12	Davidson Ck.	reach 10	373161 E 5895662 N	53.1951°N 124.8987°W	5602	4	TSF Site C Bog/Wetland Area; Site C TSF; TSF Site C Main Dam; Site D TSF	Bed eliminated	No	2.74	0.51	0.8	ns	Secondary
13	Davidson Ck.	reach 11	371792 E 5894792 N	53.187°N 124.9188°W	853	3	Site C Saddle Dam; TSF Site C Bog/Wetland Area	Bed eliminated; Saddle dam blocks access when coming from upstream	No	2.04	0.41	1.8	ns	Secondary
15	Ck. 704454	reach 1	376125 E 5897471 N	53.2121°N 124.855°W	892	16	TSF Site D Tailings Beach	Bed eliminated	No	3.62	0.49	2.4	5	No
16	Ck. 704454	reach 2	376086 E 5896933 N	53.2072°N 124.8554°W	960	17	TSF Site D Tailings Beach	Bed eliminated	No	3.02	0.56	3	10	No
17	Ck. 704454	reach 3	375893 E 5895964 N	53.1985°N 124.8579°W	195	18	TSF Site D Tailings Beach	Bed eliminated	No	3.43	0.55	2.6	4	No
18	Ck. 704454	reach 4	375072 E 5895202 N	53.1915°N 124.8699°W	1347	-	Mine Footprint; Site D Tailings Pipeline; TSF Site D Tailings Beach	Bed eliminated	No	2.61	0.43	2.5	ns	Secondary
19	Ck. 704454	reach 5	374624 E 5894718 N	53.187°N 124.8764°W	1164	-	Low Grade Stock Pile; Mine Footprint	Bed eliminated	No	2.34	0.42	1.7	ns	Secondary
20	Ck. 704454	reach 6	374009 E 5894113 N	53.1814°N 124.8854°W	1196	-	West Dump; Mine Footprint; Low Grade Stockpile	Bed eliminated	No	0.93	0.27	5.33	ns	Initial
21	Ck. 704454	reach 7	373370 E 5892175 N	53.1639°N 124.8942°W	428	-	West Dump; Mine Footprint	Bed partially eliminated	No	0.6	0.27	11.67	ns	Initial
23	Trib to Davidson Ck.	-	376522 E 5897921 N	53.2162°N 124.8493°W	1430	-	Site D TSF and Dam	Bed eliminated	No	0.75	0.17	1.5	ns	Initial
24	Trib to Davidson Ck.	reach 1	376723 E 5898562 N	53.222°N 124.8465°W	1088	-	Mine Footprint; Site D TSF Dam	Bed partially eliminated	No	1.53	0.2	2	ns	Initial
25	Trib to Davidson Ck.	reach 2-3	375780 E 5898392 N	53.2203°N 124.8606°W	1645	-	Site D TSF and Dam	Bed eliminated	No	1.33	0.43	1	ns	Secondary
26	Ck. 688328	reach 1	374945 E 5898027 N	53.2168°N 124.8729°W	2436	-	Site D TSF	Bed eliminated	No	2.37	0.41	1.4	ns	Secondary
27	Ck. 688328	reach 2	371962 E 5898019 N	53.216°N 124.9176°W	1065	-	Site D TSF	Bed partially eliminated	No	1.78	0.36	1.8	ns	Secondary
28	Trib to Davidson Ck.	-	372641 E 5895562 N	53.1941°N 124.9064°W	1024	-	Site C TSF Bog/Wetland Area	Bed eliminated	No	1.18	0.37	5	ns	Initial
29	Trib to Davidson Ck.		372705 E 5895478 N	53.1934°N 124.9054°W	813	-	Site C TSF Bog/Wetland Area	Bed partially eliminated	No	1.56	0.35	6.67	ns	Secondary
30	Trib to Davidson Ck.	reach 4-5	374985 E 5898930 N	53.2249°N 124.8727°W	1072	-	Site D TSF and Dam	Bed partially eliminated	No	1.17	0.47	4	ns	Initial
31	Trib to Davidson Ck.	-	374679 E 5898877 N	53.2244°N 124.8772°W	1438	-	Site D TSF	Bed eliminated	No	0.98	0.53	4.5	ns	Initial
32	Trib to Ck. 704454	-	373877 E 5894102 N	53.1813°N 124.8873°W	1106	-	West Dump	Bed eliminated	No	1.42	0.27	4	ns	Initial
33	Trib to Ck. 704454	-	373653 E 5894159 N	53.1817°N 124.8907°W	3002	-	West Dump	Bed eliminated	No	0.43	0.37	2.5	ns	Initial
34	Trib to Ck. 704454	-	373689 E 5893994 N	53.1803°N 124.8901°W	1385	-	West Dump; Mine Footprint	Bed eliminated	No	1.81	0.53	2.25	ns	Secondary
35	Ck. 543585	reach 2	374224 E 5893350 N	53.1746°N 124.8819°W	1926	-	Mine Footprint; Operation Camp; Construction Camp	Bed eliminated	No	1.17	0.4	1.67	ns	Initial

(continued)

Table 3.1-1. Stream Crossing and Reach Minor Works and Waters Assessment within and Downstream of Project Footprint (completed)

Stream Information							Works Evaluation			Waters Evaluation				
New Site ID	Waterbody	Reach	UTM	Latitude/ Longitude	Impacted Stream Length (m)	Photo Plate No.[1]	Type of Work	Type of Interaction	Exempt as Minor Works	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Blockages[2]	Exempt as Minor Waters
36	Trib to Ck. 704454	-	374883 E 5893049 N	53.1721°N 124.8719°W	2423	-	Open Pit; Mine Footprint; Low Grade Stockpile	Bed eliminated	No	1.17	0.15	16.5	ns	Initial
37	Trib to Ck. 704454	-	373709 E 5892235 N	53.1645°N 124.8891°W	323	-	Mine Footprint	Bed eliminated	No	2.93	0.27	7.3	ns	Initial
38	Ck. 146920	reach 1	377928 E 5895212 N	53.205°N 124.8712°W	-	-	Camp facilities; Diversions	Water diverted	No	1.65	0.47	4.5	ns	Secondary
39	Ck. 146920	reach 2	377281 E 5893946 N	53.1807°N 124.8364°W	3240	-	East Dump; Mine Footprint	Bed partially eliminated	No	1.58	0.37	3.88	ns	Secondary
40	Ck. 146920	reach 3	376609 E 5893983 N	53.1809°N 124.8464°W	660	-	East Dump	Bed eliminated	No	1.21	0.3	0.5	ns	Secondary
42	Ck. 505659	reach 6	376313 E 5895933 N	53.1983°N 124.8516°W	1477	-	East Side of Site D TSF	Bed partially eliminated	No	0.78	0.43	1.9	ns	Initial
43	Ck. 505659	reach 7	376031 E 5894825 N	53.1883°N 124.8554°W	1525	-	Top Soil Stockpile; Process Plant	Bed partially eliminated	No	0.67	0.3	0.7	ns	Initial
44	Trib to Ck. 505659	-	376370 E 5895895 N	53.198°N 124.8508°W	619	-	Site D TSF	Bed eliminated	No	0.73	0.13	0.5	ns	Initial
45	Trib to Davidson Ck.	-	375028 E 5896712 N	53.2050°N 124.8712°W	1774	-	Site D TSF	Bed eliminated	No	0.40	0.47	1.83	ns	Initial
Reaches Affected by Flow Changes from Mine Site Works/Activities, and Fish Habitat Compensation														
1	Chedakuz Ck.	reach 15	385024 E 5908268 N	53.3111°N 124.7257°W	940 (100%)	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	27.1	ns	<1	0	No
22	Trib to Davidson Ck.	reach 7	377117 E 5899691 N	53.2323°N 124.841°W	524	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	0.98	0.3	1.39	ns	Initial
2	Davidson Ck.	reach 1	384224 E 5907707 N	53.3059°N 124.7375°W	-	15	N/A (Downstream of mine site works)	Predicted flow changes	N/A	6.41	0.72	0.4	5	No
3	Davidson Ck.	reach 2	383988 E 5907428 N	53.3033°N 124.741°W	-	13, 14	N/A (Downstream of mine site works)	Predicted flow changes	N/A	6.44	0.62	0.5	10	No
4	Davidson Ck.	reach 3	383498 E 5907141 N	53.3006°N 124.7482°W	-	12	N/A (Downstream of mine site works)	Predicted flow changes	N/A	6.03	1	0.3	4	No
5	Davidson Ck.	reach 4	383045 E 5906220 N	53.2923°N 124.7547°W	-	11	N/A (Downstream of mine site works)	Predicted flow changes	N/A	6.92	0.71	1	2	No
6	Davidson Ck.	reach 5	381843 E 5904042 N	53.2724°N 124.7719°W	-	10	N/A (Downstream of mine site works)	Predicted flow changes	N/A	5.66	0.53	0.4	4	No
46	Ck. 661	reach 1	388683 E 5899434 N	53.2325°N -124.6678°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	4.87	0.37	2	ns	No
47	Ck. 661	reach 2	386031 E 5898475 N	53.2233°N -124.7071°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	4.68	0.40	1	ns	No
48	Ck. 661	reach 3	385283 E 5898500 N	53.2234°N -124.7183°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	3.88	0.57	0.88	ns	No
49	Ck. 661	reach 4	382643 E 5898525 N	53.2230°N -124.7579°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	3.05	0.3	0.88	ns	No
50	Ck. 505659	reach 1	382643 E 5898525 N	53.2168°N -124.7811°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	3.7	0.63	2.33	2	No
51	Ck. 505659	reach 2	386031 E 5898475 N	53.2141°N -124.7852°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	3.9	0.9	1.17	2	No
52	Ck. 505659	reach 3	385283 E 5898500 N	53.2134°N -124.7900°W	-	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	6.1	0.57	1.67	1	No
41	Ck. 505659	reach 5	377907 E 5895794 N	53.1974°N 124.8277°W	2378	-	N/A (Downstream of mine site works)	Predicted flow changes	N/A	1.52	0.33	0.5	ns	Secondary
14	Davidson Ck.	reach 12	371256 E 5894208 N	53.1816°N 124.9266°W	62	2	Fish habitat compensation: coffer dam and diversion structures	Flooding and predicted flow changes to direction and volume	No	3.42	0.48	0.5	2	No
-[3]	Davidson Ck. (Lk. 01682LNRS)	Reach 13	ns	ns	ns	1	Fish habitat compensation: diversion structures	Flooding and predicted flow changes to direction and volume	No	9*	ns	ns	ns	No
-[4]	Creek 705 (Lk. 01538EEUT)	ns	ns	ns	ns	-	Fish habitat compensation: diversion structures	Predicted flow changes	No	35.2*	ns	ns	ns	No

Meets initial review criteria for minor waters | *Meets secondary review criteria for minor waters* | *Minor water (initial or secondary review test)* | *Non-minor water*

Notes: New Site IDs have been assigned (illustrated in Figure 3.1-1) with original baseline IDs listed in Appendix A; Sinuosity was not measured in the field due to inaccessibility of some reaches; m - metre; Mean BfD - mean bankfull depth; Mean BfW - mean bankfull width; No. - number; ns - not sampled; % - percent; Trib - tributary; TSF - tailings storage facility; U/S - upstream; UTM - Universal Transverse Mercator; Details including site UTMs, watershed number, sinuosity and navigability notes are available in Appendix A.

** GIS estimate of lake surface area.*

[1] Photo numbers refer to Photo Plates in Appendix C; Dash indicates no photo.

[2] Blockages are natural obstructions such as log jams, but does not include large woody debris, which may also affect navigability.

[3] Added in after original baseline study regarding proposed fish habitat compensation for Lake 01682LNRS (reach illustrated in Figure 3.1-1).

[4] Added in after original baseline study regarding proposed fish habitat compensation for Lake 01538UEUT (lake illustrated in Figure 3.1-2).

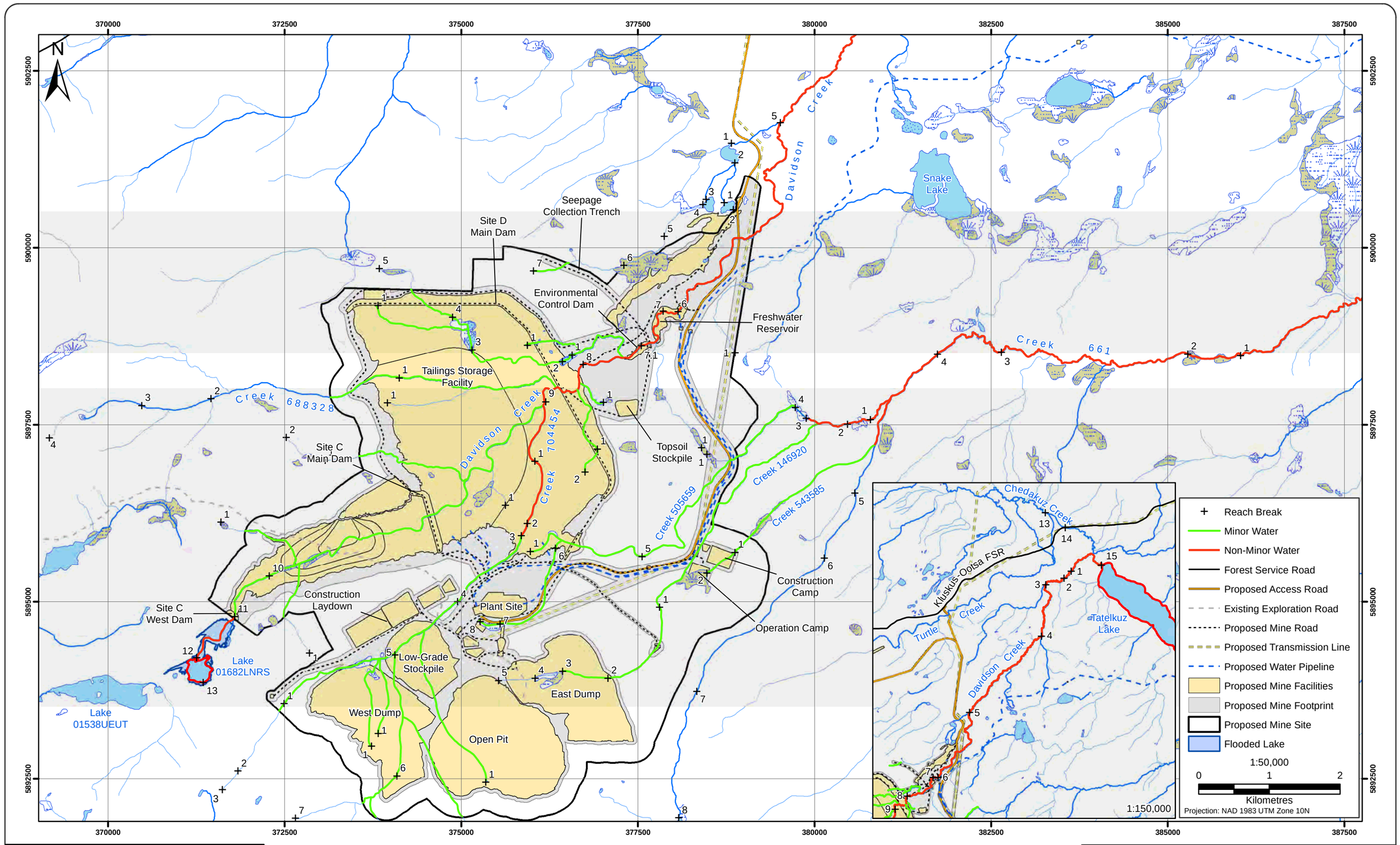

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Figure 3.1-1

Results of the Minor Waters Evaluation for Blackwater Gold Project Mine Site

Table 3.1-2. Summary of Minor Water Screening Within and Downstream of the Mine Site

Waterbodies	Total Reaches	Minor Water		Total	
		Initial	Secondary	Minor Water	Non-Minor Water
Interacting with Mine Site Works					
Davidson Ck.	7	0	2	2	5
Ck. 704454	7	2	2	4	3
Trib to Davidson Ck.	8	6	2	8	0
Trib to Ck. 704454	5	4	1	5	0
Ck. 688328	2	0	2	2	0
Ck. 543585	1	1	0	1	0
Ck. 146920	3	0	3	3	0
Ck. 505659	2	2	0	2	0
Trib to Ck. 505659	1	1	0	1	0
Sub-total	**36**	**16**	**12**	**28**	**8**
Downstream of Mine Site Works					
Chedakuz Ck.	1	0	0	0	1
Davidson Ck. (1-5)	5	0	0	0	5
Trib to Davidson Ck.	1	1	0	1	0
Creek 661	4	0	0	0	4
Ck. 505659	4	0	1	1	3
Sub-total	**15**	**1**	**1**	**2**	**13**
Associated with Fish Habitat Compensation					
Davidson Ck. (12,13)	2	0	0	0	2
Creek 705 (Lk. 01538EEUT)	1	0	0	0	1
Sub-total	3	0	0	0	3
TOTAL	**54**	**17**	**13**	**30**	**24**

Note: Counts do not include streams surveyed that were deemed to be no visible channel (NVC), which are listed in Appendix A.

Davidson Creek Catchment

Description of Hydrological Changes

Flows in Davidson Creek downstream of the TSF and water reservoir (reaches 1 to 5) are anticipated to be affected by development of the TSF and other mining activities (i.e., open pit development) which could affect groundwater or surface flows. In addition, flows in the upper two reaches (12 and 13; Figure 3.1-1) of Davidson Creek that are part of the modelled 11-DC sub-catchment (Table 3.1-2 to 5; Figure 3.1-2) are anticipated to be affected by fish habitat compensation activities (plan view provided in Appendix B).

Construction of the TSF and associated Environmental Control Dam and seepage collection trench near the Reach 7.1 break on Davidson Creek (Figure 3.1-1) will restrict surface water and groundwater flows downstream along Davidson Creek during operations and closure phases. As a result, any mining activities upstream of the trench during operation and closure (i.e., development of open pit and subsequent groundwater inflows) will have no incremental effect on the downstream hydrology in Davidson Creek. Runoff from the TSF Site D Main Dam and the majority of seepage will be collected at this trench and pumped back to the TSF (Knight Piésold Ltd. 2013). The mine plan includes a freshwater mitigation system that will supply water to Davidson Creek during operations and closure to

compensate flow reductions. Modelling was conducted for end of mine (Y 17, operation) and closure conditions for a mitigated scenario—that incorporated the freshwater supply to Davidson Creek—and an unmitigated scenario without freshwater supply (Knight Piésold Ltd. 2013). The mitigated scenario assumed pumping of water from Tatelkuz Lake to meet biologically determined flow needs with a temporal variance based on the life history requirements of fish species in Davidson Creek (AMEC, 2013). The freshwater was assumed to be supplied to Davidson Creek immediately downstream of the ECD (from the freshwater reservoir) during the end of mine and closure phases of the mine life (Knight Piésold Ltd. 2013). The mitigated scenarios presented in this report resulted in substantially less modelled flow percent changes in downstream reaches than the unmitigated scenarios.

The watershed model for the Davidson Creek catchment included the following sub-catchments (with corresponding areas) reported in Tables 3.1-3 to 3.1-10: 11-DC (2.66 m^2), H2 (41.70 m^2), H4B (17.03 m^2), 4-DC (8.96 m^2), and 1-DC (5.86 m^2). Predicted streamflow changes shown in Tables 3.1-7 to 3.1-10 were calculated for sub-catchments with available rating curves per the equations shown in Table 3.1-11. During construction, the average annual streamflow at the H2 node located near the Environmental Control Dam in Davidson Creek (Figure 3.1-2) was estimated to decrease from 281 L/s to 216 L/s (25%, Table 3.1-3). This average decrease is attributed to the redirection of streamflows from the 11-DC sub-catchment to Creek 705 sub-catchment and collection of all surface water at the sediment control pond downstream of the Site C Main Dam. Similarly, there are decreases in streamflows predicted for the other downstream nodes on Davidson Creek (Table 3.1-3), except for a slight (<1 L/s) increase in streamflow at node H4-B attributed to re-routing of surface water flow at sediment control ponds (Knight Piésold Ltd. 2013).

As shown in Tables 3.1-3 to 3.1-10, flow changes for Davidson Creek are predicted to be greatest during operation (predicted 26% decrease at H2 and H4-B), generally diminishing in time (towards post-closure) and space (becoming less pronounced at downstream reaches along Davidson Creek). The exception is a predicted post-closure 74% decrease from annual average baseline conditions at H2 on Davidson Creek (Table 3.1-6). This corresponds with a 13 cm annual average drop as shown in Table 3.1-10. The changes in flow at H2 are due to the decommissioning of the fresh water supply mitigation system; however the most pronounced effects will be seasonally limited to May and June (with respective 85% and 86% reductions). Reductions will be less pronounced in the other months of the year, and farther downstream (i.e., 10% reduction in average annual flows at 1-DC, Table 3.1-6) (Knight Piésold Ltd. 2013). The 12% annual average reduction at H4B shown in Table 3.1-6 corresponds to an average annual drop of 1 cm, as shown in Table 3.1-10.

The coffer dam in upper Davidson Creek (illustrated in Appendix B, Lake 01682LNRS Enlargement Plan) to support fish habitat compensation projects will be located west of the Site C West (Saddle) Dam within sub-catchment 11-DC (Figure 3.1-2). As shown in the figure in Appendix B, the coffer dam and diversion ditch between Lake 01682LNRS (Davidson Creek Reach 13) and Lake 01538EUT (Creek 705) will result in flooding of reaches 12 and 13 of Davidson Creek, with the total area increasing from 91,860 m^2 (Lake 01682LNRS) to 217,339 m^2, as well as a reversal of their flows towards the Creek 705 catchment. The reversal in flow direction at 11-DC is indicated by the average annual flow changes of -100% for operation, closure and post-closure (Tables 3.1-3 to 3.1-6).

Relation of Hydrological Changes to MWWO Screening of Reaches

Reaches 1 to 5 of Davidson Creek, which are downstream of works and solely subject to potential flow changes, have been found to be ***non-minor*** waters in the MWWO (2009) screening (Table 3.1-1). In addition, both of the upper reaches of Davidson Creek (12 and 13) that will be affected by flow changes from proposed fish habitat compensation have been found to be ***non-minor*** in the MWWO screening (Table 3.1-1). An assessment of the navigability under the common law interpretation for all these reaches of Davidson Creek will therefore be conducted.

Table 3.1-3. Unmitigated Construction Scenario: Predicted Percent (%) Streamflow Changes from Baseline Conditions as a Result of the Project

	Davidson Creek					Creek 661			Creek 705				Chedakuz	
	11-DC	**H2**	**H4B**	**4-DC**	**1-DC**	**H1**	**1-505659**	**1-661**	**6-705***	**4-705**	**H7**	**1-705**	**H5**	**15-CC**
January	n/a	-24	-18	-18	-15	-17	0[2]	0[2]	200	60	15	10	-2	0[2]
February	n/a	-24	-19	-18	-16	0[2]	0[2]	0[2]	300	150	18	10	-2	0[2]
March	n/a	-24	-18	-17	-15	0[2]	0[2]	0[2]	300	300	19	10	-2	0[2]
April	-100[1]	-29	-20	-16	-14	-5	5	1	61	15	4	4	-2	0[2]
May	-100[1]	-24	-20	-18	-18	-2	4	1	41	12	4	4	-3	0[2]
June	-100[1]	-22	-19	-18	-18	-2	3	1	65	21	7	7	-3	0[2]
July	-100[1]	-21	-17	-17	-15	-3	-1	0[2]	52	18	7	6	-2	0[2]
August	-100[1]	-23	-17	-17	-15	0[2]	0[2]	-1	50	18	6	6	-3	0[2]
September	-100[1]	-23	-17	-17	-15	0[2]	0[2]	-1	56	22	6	5	-2	0[2]
October	-100[1]	-23	-18	-17	-15	0[2]	3	1	50	16	4	4	-2	0[2]
November	-100[1]	-24	-18	-17	-15	0[2]	0[2]	1	60	18	4	4	-2	0[2]
December	n/a	-23	-17	-17	-15	-13	0[2]	-1	100	36	9	7	-2	0[2]
ANNUAL AVERAGE	**-100[1]**	**-23**	**-19**	**-18**	**-16**	**-3**	**3**	**1**	**56**	**17**	**6**	**5**	**-2**	**0[2]**

Notes:
Unmitigated streamflow estimates in Davidson Creek do not include freshwater inputs from the freshwater supply input downstream of the environmental control dam. Percentages are calculated based on the model results and assumptions from the Watershed Modelling Report (Knight Piésold Ltd. 2013).
**Located at Lake 01538EUT.*
Cells containing "n/a" are months where the baseline flow is 0 L/s.
[1] *The construction of the coffer dam at 11-DC will reverse surface flow from the headwaters of Davidson Creek towards Creek 705. At post closure flow conditions 11-DC will be located on a surface water divide.*
[2] *Negligible changes in annual average streamflow from baseline conditions are predicted.*

Table 3.1-4. Mitigated End of Mine (Operation) Scenario: Predicted Percent (%) Streamflow Changes from Baseline Conditions as a Result of the Project

	Davidson Creek					Creek 661			Creek 705				Chedakuz	
	11-DC	**H2**	**H4B**	**4-DC**	**1-DC**	**H1**	**1-505659**	**1-661**	**6-705***	**4-705**	**H7**	**1-705**	**H5**	**15-CC**
January	n/a	-6	-13	-13	-11	-33	-8	-3	200	60	15	10	-13	-17
February	n/a	2	-7	-7	-6	-50	-11	-4	300	150	18	10	-12	-17
March	n/a	9	-1	-1	-1	-67	-13	-2	300	300	19	10	-10	-15
April	-100[1]	-39	-32	-26	-23	-10	-17	-4	61	15	4	4	-9	-8
May	-100[1]	-30	-28	-25	-24	-1	-27	-8	41	12	4	4	-15	-16
June	-100[1]	-33	-32	-30	-29	-1	-38	-12	65	21	7	7	-17	-18
July	-100[1]	-25	-26	-25	-23	-3	-33	-10	52	18	7	6	-15	-17
August	-100[1]	-21	-25	-25	-22	-6	-22	-6	50	18	6	6	-16	-18
September	-100[1]	-29	-32	-31	-28	-18	-15	-4	56	22	6	5	-13	-14
October	-100[1]	-31	-33	-31	-27	-9	-19	-5	50	16	4	4	-14	-14
November	-100[1]	-28	-30	-28	-24	-18	-18	-4	60	18	4	4	-11	-12
December	n/a	-11	-17	-17	-15	-25	-6	-4	100	36	9	7	-12	-15
ANNUAL AVERAGE	**-100[1]**	**-26**	**-26**	**-25**	**-23**	**-6**	**-28**	**-8**	**56**	**17**	**6**	**5**	**-14**	**-15**

Notes:
Percentages are calculated based on the model results and assumptions from the Watershed Modelling Report (Knight Piésold Ltd. 2013).
**Located at Lake 01538EUT.*
Cells containing "n/a" are months where the baseline flow is 0 L/s.
[1] The construction of the coffer dam at 11-DC will reverse surface flow from the headwaters of Davidson Creek towards Creek 705. At post closure, flow conditions 11-DC will be located on a surface water divide.

Table 3.1-5. Mitigated Closure Scenario: Predicted Percent (%) Streamflow Changes from Baseline Conditions as a Result of the Project

	Davidson Creek					Creek 661			Creek 705				Chedakuz	
	11-DC	**H2**	**H4B**	**4-DC**	**1-DC**	**H1**	**1-505659**	**1-661**	**6-705***	**4-705**	**H7**	**1-705**	**H5**	**15-CC**
January	n/a	-6	-13	-12	-10	-33	-33	-6	200	60	15	10	-11	-14
February	n/a	2	-7	-6	-5	-50	-33	-5	300	150	18	10	-10	-14
March	n/a	9	-1	0[2]	-1	-67	-25	-2	300	300	19	10	-8	-12
April	-100[1]	-39	-27	-22	-20	-10	-32	-7	61	15	4	4	-7	-7
May	-100[1]	-30	-21	-19	-19	-1	-42	-13	41	12	4	4	-14	-16
June	-100[1]	-33	-27	-26	-25	-1	-60	-19	65	21	7	7	-16	-18
July	-100[1]	-25	-23	-22	-21	-3	-55	-16	52	18	7	6	-14	-16
August	-100[1]	-21	-24	-23	-20	-6	-47	-11	50	18	6	6	-14	-16
September	-100[1]	-29	-31	-30	-26	-18	-42	-10	56	22	6	5	-11	-11
October	-100[1]	-31	-30	-28	-25	-9	-46	-11	50	16	4	4	-12	-12
November	-100[1]	-28	-28	-26	-22	-18	-44	-10	60	18	4	4	-9	-10
December	n/a	-11	-16	-16	-14	-25	-35	-7	100	36	9	7	-10	-12
ANNUAL AVERAGE	**-100[1]**	**-26**	**-23**	**-21**	**-20**	**-6**	**-48**	**-13**	**56**	**17**	**6**	**5**	**-12**	**-14**

Notes:
Percentages are calculated based on the model results and assumptions from the Watershed Modelling Report (Knight Piésold Ltd. 2013).
**Located at Lake 01538EUT.*
Cells containing "n/a" are months where the baseline flow is 0 L/s.
[1]The construction of the coffer dam at 11-DC will reverse surface flow from the headwaters of Davidson Creek towards Creek 705. At post closure flow conditions 11-DC will be located on a surface water divide.
[2] Negligible changes in annual average streamflow from baseline conditions are predicted.

Table 3.1-6. Unmitigated Post-closure Scenario: Predicted Percent (%) Streamflow Changes from Baseline Conditions as a Result of the Project

	Davidson Creek					Creek 661			Creek 705				Chedakuz	
	11-DC	**H2**	**H4B**	**4-DC**	**1-DC**	**H1**	**1-505659**	**1-661**	**6-705***	**4-705**	**H7**	**1-705**	**H5**	**15-CC**
January	n/a	-56	-17	-16	-14	0[2]	-25	-4	200	60	15	10	-1	1
February	n/a	-53	-16	-16	-14	0[2]	-22	-2	300	150	18	10	-1	1
March	n/a	-50	-13	-12	-11	0[2]	-25	-1	300	300	19	10	-1	1
April	-100[1]	-65	3	2	2	0[2]	-30	-6	61	15	4	4	1	1
May	-100[1]	-85	13	12	11	0[2]	-42	-13	41	12	4	4	3	2
June	-100[1]	-86	-23	-22	-21	0[2]	-59	-19	65	21	7	7	-4	-1
July	-100[1]	-77	-33	-32	-29	0[2]	-54	-16	52	18	7	6	-5	-1
August	-100[1]	-67	-35	-34	-30	0[2]	-47	-10	50	18	6	6	-6	0[2]
September	-100[1]	-63	-23	-22	-19	0[2]	-42	-9	56	22	6	5	-3	0[2]
October	-100[1]	-63	-10	-9	-8	0[2]	-43	-9	50	16	4	4	-1	1
November	-100[1]	-61	-17	-15	-14	0[2]	-44	-9	60	18	4	4	-2	0[2]
December	n/a	-57	-17	-17	-14	0[2]	-35	-6	100	36	9	7	-1	1
ANNUAL AVERAGE	-100[1]	-74	-12	-11	-10	0[2]	-48	-12	56	17	6	5	-1	0[2]

Notes:
Unmitigated streamflow estimates in Davidson Creek do not include freshwater inputs from the freshwater supply input downstream of the environmental control dam. Percentages are calculated based on the model results and assumptions from the Watershed Modelling Report (Knight Piésold Ltd. 2013).
**Located at Lake 01538EUT.*
Cells containing "n/a" are months where the baseline flow is 0 L/s.
[1]The construction of the coffer dam at 11-DC will reverse surface flow from the headwaters of Davidson Creek towards Creek 705. At post closure flow conditions 11-DC will be located on a surface water divide;
[2] Negligible changes in annual average streamflow from baseline conditions are predicted.

Table 3.1-7. Construction Scenario: Predicted Streamflow Changes in Water Level (m) from Baseline Conditions as a Result of the Project

	Davidson Creek						Creek 661			Creek 705			Chedakuz Creek		
	H2			H4B			H1			H7			H5		
	Baseline	Construction	Change	Baseline	Construction	Change	Baseline	Construction	Change	Baseline	Construction	Change	Baseline	Construction	Change
January	0.19	0.16	-0.02	0.11	0.10	-0.01	0.05	0.05	< -0.01	0.10	0.11	0.01	0.37	0.37	< -0.01
February	0.18	0.16	-0.02	0.10	0.09	-0.01	0.04	0.04	0.00	0.09	0.09	0.01	0.37	0.36	< -0.01
March	0.17	0.15	-0.02	0.10	0.09	-0.01	0.04	0.04	0.00	0.09	0.09	0.01	0.39	0.39	< -0.01
April	0.23	0.19	-0.03	0.15	0.13	-0.02	0.10	0.09	< -0.01	0.24	0.24	< 0.01	0.54	0.53	< -0.01
May	0.44	0.39	-0.05	0.27	0.24	-0.03	0.23	0.23	< -0.01	0.26	0.27	< 0.01	0.78	0.77	-0.01
June	0.45	0.40	-0.05	0.27	0.24	-0.03	0.23	0.23	< -0.01	0.21	0.22	0.01	0.75	0.74	-0.01
July	0.28	0.25	-0.03	0.17	0.15	-0.02	0.13	0.13	< -0.01	0.23	0.23	0.01	0.51	0.50	-0.01
August	0.22	0.20	-0.03	0.13	0.12	-0.01	0.09	0.09	0.00	0.17	0.17	< 0.01	0.39	0.39	-0.01
September	0.21	0.18	-0.02	0.12	0.11	-0.01	0.07	0.07	0.00	0.16	0.16	< 0.01	0.40	0.40	< -0.01
October	0.21	0.18	-0.02	0.12	0.11	-0.01	0.07	0.07	0.00	0.19	0.19	< 0.01	0.40	0.39	< -0.01
November	0.20	0.18	-0.03	0.12	0.11	-0.01	0.07	0.07	0.00	0.18	0.18	< 0.01	0.44	0.43	< -0.01
December	0.19	0.17	-0.02	0.11	0.10	-0.01	0.06	0.06	< -0.01	0.13	0.13	< 0.01	0.39	0.39	< -0.01
Annual Average	**0.27**	**0.23**	**-0.03**	**0.16**	**0.14**	**-0.02**	**0.12**	**0.12**	**< -0.01**	**0.23**	**0.24**	**< 0.01**	**0.50**	**0.49**	**-0.01**

Notes: Predicted changes in water level only calculated for stations where rating curves were available. Stage data derived from 2012 rating equations in Table 3.1-10. Italicized values were derived using the high stage rating equations. Negative (change) values represent a decrease in stage from the baseline conditions.

Table 3.1-8. Mitigated End of Mine (Operation) Scenario: Predicted Streamflow Changes in Water Level (m) from Baseline Conditions as a Result of the Project

	Davidson Creek						Creek 661			Creek 705			Chedakuz Creek		
	H2			H4B			H1			H7			H5		
	Baseline	Operation	Change	Baseline	Operation	Change	Baseline	Operation	Change	Baseline	Operation	Change	Baseline	Operation	Change
January	0.19	0.18	-0.01	0.11	0.10	-0.01	0.05	0.04	-0.01	0.10	0.11	0.01	0.37	0.35	-0.02
February	0.18	0.18	< 0.01	0.10	0.10	< -0.01	0.04	0.03	-0.01	0.09	0.09	0.01	0.37	0.34	-0.02
March	0.17	0.18	0.01	0.10	0.10	< -0.01	0.04	0.02	-0.02	0.09	0.09	0.01	0.39	0.37	-0.02
April	0.23	0.18	-0.05	0.15	0.12	-0.03	0.10	0.09	< -0.01	0.24	0.24	< 0.01	0.54	0.51	-0.02
May	0.44	0.37	-0.07	0.27	0.23	-0.04	0.23	0.23	< -0.01	0.26	0.27	< 0.01	0.78	0.72	-0.06
June	0.45	0.37	-0.08	0.27	0.22	-0.05	0.23	0.23	< -0.01	0.21	0.22	0.01	0.75	0.68	-0.07
July	0.28	0.25	-0.04	0.17	0.14	-0.02	0.13	0.13	< -0.01	0.23	0.23	0.01	0.51	0.47	-0.04
August	0.22	0.20	-0.02	0.13	0.12	-0.02	0.09	0.08	< -0.01	0.17	0.17	< 0.01	0.39	0.36	-0.03
September	0.21	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	-0.01	0.16	0.16	< 0.01	0.40	0.37	-0.03
October	0.21	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	< -0.01	0.19	0.19	< 0.01	0.40	0.37	-0.03
November	0.20	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	-0.01	0.18	0.18	< 0.01	0.44	0.41	-0.02
December	0.19	0.18	-0.01	0.11	0.10	-0.01	0.06	0.05	-0.01	0.13	0.13	< 0.01	0.39	0.37	-0.02
Annual Average	**0.27**	**0.23**	**-0.04**	**0.16**	**0.14**	**-0.02**	**0.12**	**0.12**	**< -0.01**	**0.23**	**0.24**	**< 0.01**	**0.50**	**0.46**	**-0.04**

Notes: Predicted changes in water level only calculated for stations where rating curves were available. Stage data derived from 2012 rating equations in Table 3.1-10. Italicized values were derived using the high stage rating equations. Negative (change) values represent a decrease in stage from the baseline conditions.

Table 3.1-9. Mitigated End of Mine (Closure) Scenario: Predicted Streamflow Changes in Water Level (m) from Baseline Conditions as a Result of the Project

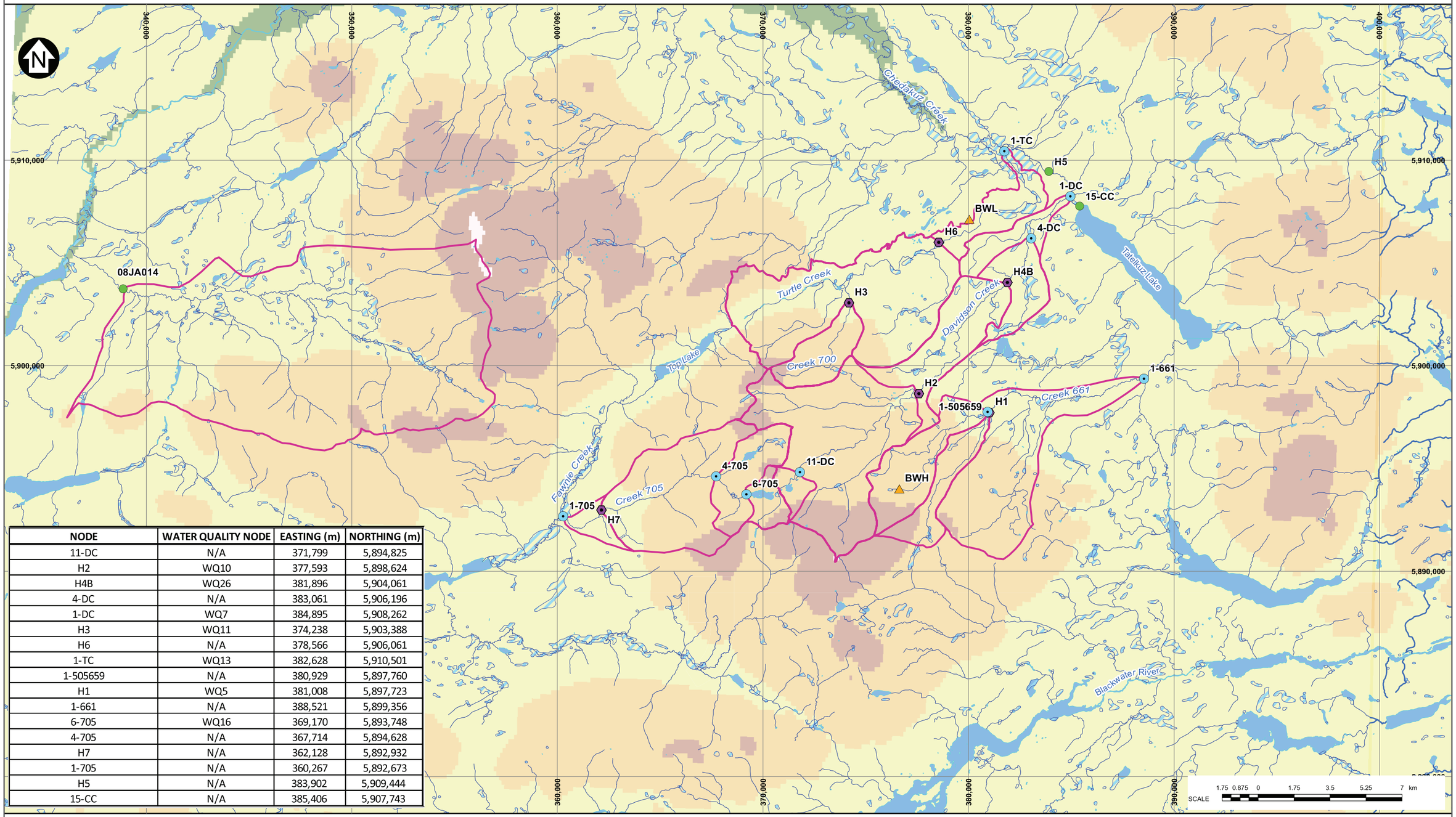
	Davidson Creek						Creek 661			Creek 705			Chedakuz Creek		
	H2			H4B			H1			H7			H5		
	Baseline	Closure	Change	Baseline	Closure	Change	Baseline	Closure	Change	Baseline	Closure	Change	Baseline	Closure	Change
January	0.19	0.18	-0.01	0.11	0.10	-0.01	0.05	0.04	-0.01	0.10	0.11	0.01	0.37	0.35	-0.02
February	0.18	0.18	< 0.01	0.10	0.10	< -0.01	0.04	0.03	-0.01	0.09	0.09	0.01	0.37	0.35	-0.02
March	0.17	0.18	0.01	0.10	0.10	< -0.01	0.04	0.02	-0.02	0.09	0.09	0.01	0.39	0.38	-0.02
April	0.23	0.18	-0.05	0.15	0.12	-0.02	0.10	0.09	< -0.01	0.24	0.24	< 0.01	0.54	0.52	-0.02
May	0.44	0.37	-0.07	0.27	0.24	-0.03	0.23	0.23	< -0.01	0.26	0.27	< 0.01	0.78	0.73	-0.06
June	0.45	0.37	-0.08	0.27	0.23	-0.04	0.23	0.23	< -0.01	0.21	0.22	0.01	0.75	0.68	-0.06
July	0.28	0.25	-0.04	0.17	0.15	-0.02	0.13	0.13	< -0.01	0.23	0.23	0.01	0.51	0.47	-0.04
August	0.22	0.20	-0.02	0.13	0.12	-0.02	0.09	0.08	< -0.01	0.17	0.17	< 0.01	0.39	0.36	-0.03
September	0.21	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	-0.01	0.16	0.16	< 0.01	0.40	0.38	-0.02
October	0.21	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	< -0.01	0.19	0.19	< 0.01	0.40	0.37	-0.02
November	0.20	0.17	-0.03	0.12	0.10	-0.02	0.07	0.07	-0.01	0.18	0.18	< 0.01	0.44	0.42	-0.02
December	0.19	0.18	-0.01	0.11	0.10	-0.01	0.06	0.05	-0.01	0.13	0.13	< 0.01	0.39	0.37	-0.02
Annual Average	**0.27**	**0.23**	**-0.04**	**0.16**	**0.14**	**-0.02**	**0.12**	**0.12**	**< -0.01**	**0.23**	**0.24**	**< 0.01**	**0.50**	**0.47**	**-0.03**

Notes: Predicted changes in water level only calculated for stations where rating curves were available. Stage data derived from 2012 rating equations in Table 3.1-10. Italicized values were derived using the high stage rating equations. Negative (change) values represent a decrease in stage from the baseline conditions.

Table 3.1-10. Post-closure Scenario: Predicted Streamflow Changes in Water Level (m) from Baseline Conditions as a Result of the Project

	Davidson Creek						Creek 661			Creek 705			Chedakuz Creek		
	H2			H4B			H1			H7			H5		
	Baseline	Post-closure	Change	Baseline	Post-closure	Change	Baseline	Post-closure	Change	Baseline	Post-closure	Change	Baseline	Post-closure	Change
January	0.19	0.13	-0.06	0.11	0.10	-0.01	0.05	0.05	0.00	0.10	0.11	0.01	0.37	0.37	< -0.01
February	0.18	0.12	-0.05	0.10	0.10	-0.01	0.04	0.04	0.00	0.09	0.09	0.01	0.37	0.37	< -0.01
March	0.17	0.12	-0.05	0.10	0.09	-0.01	0.04	0.04	0.00	0.09	0.09	0.01	0.39	0.39	< -0.01
April	0.23	0.14	-0.09	0.15	0.15	< 0.01	0.10	0.10	0.00	0.24	0.24	< 0.01	0.54	0.54	< 0.01
May	0.44	0.18	-0.27	0.27	0.29	0.02	0.23	0.23	0.00	0.26	0.27	< 0.01	0.78	0.80	0.01
June	0.45	0.18	-0.27	0.27	0.23	-0.03	0.23	0.23	0.00	0.21	0.22	0.01	0.75	0.73	-0.02
July	0.28	0.14	-0.14	0.17	0.14	-0.03	0.13	0.13	0.00	0.23	0.23	0.01	0.51	0.50	-0.01
August	0.22	0.13	-0.09	0.13	0.11	-0.03	0.09	0.09	0.00	0.17	0.17	< 0.01	0.39	0.38	-0.01
September	0.21	0.13	-0.08	0.12	0.11	-0.02	0.07	0.07	0.00	0.16	0.16	< 0.01	0.40	0.40	-0.01
October	0.21	0.13	-0.08	0.12	0.12	-0.01	0.07	0.07	0.00	0.19	0.19	< 0.01	0.40	0.40	< -0.01
November	0.20	0.13	-0.07	0.12	0.11	-0.01	0.07	0.07	0.00	0.18	0.18	< 0.01	0.44	0.43	< -0.01
December	0.19	0.13	-0.06	0.11	0.10	-0.01	0.06	0.06	0.00	0.13	0.13	< 0.01	0.39	0.39	< -0.01
Annual Average	**0.27**	**0.14**	**-0.13**	**0.16**	**0.15**	**-0.01**	**0.12**	**0.12**	**0.00**	**0.23**	**0.24**	**< 0.01**	**0.50**	**0.49**	**< -0.01**

Notes: Predicted changes in water level only calculated for stations where rating curves were available. Stage data derived from 2012 rating equations in Table 3.1-10. Italicized values were derived using the high stage rating equations. Negative (change) values represent a decrease in stage from the baseline conditions.



NODE	WATER QUALITY NODE	EASTING (m)	NORTHING (m)
11-DC	N/A	371,799	5,894,825
H2	WQ10	377,593	5,898,624
H4B	WQ26	381,896	5,904,061
4-DC	N/A	383,061	5,906,196
1-DC	WQ7	384,895	5,908,262
H3	WQ11	374,238	5,903,388
H6	N/A	378,566	5,906,061
1-TC	WQ13	382,628	5,910,501
1-505659	N/A	380,929	5,897,760
H1	WQ5	381,008	5,897,723
1-661	N/A	388,521	5,899,356
6-705	WQ16	369,170	5,893,748
4-705	N/A	367,714	5,894,628
H7	N/A	362,128	5,892,932
1-705	N/A	360,267	5,892,673
H5	N/A	383,902	5,909,444
15-CC	N/A	385,406	5,907,743

Source: Knight Piesold 2013e.

LEGEND:

- CLIMATOLOGY STATION
- HYDROLOGY STATION/WATERSHED MODEL NODE
- NODE NOT INCLUDED IN WATERSHED MODEL
- WATERSHED MODEL NODE
- RIVER
- CATCHMENT BOUNDARY
- LAKE
- WETLAND

ELEVATION BAND (M)

- < 915
- 915-1220
- 1220-1525
- 1525-1830
- > 1830

NOTES:

1. BASE MAP: CANADA DEM GEOBASE.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:175,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

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Figure 3.1-2

Blackwater Gold Project
Watershed Model Node Locations

Table 3.1-11. Rating Equations to Derive Stage Discharge Data

Rating Equations (2012)	
Station	**Equation**
H1 (low)	$Q = 2.55(Stage - 0.528)^{2.08}$ for stage <= 0.790
H1 (high)	$Q = 1.408(Stage -0.407)^{1.92}$ for stage > 0.790 m
H2	$Q = 4.4(Stage - 0.38)^{2.08}$
H4B	$Q = 12.345(Stage - 10.4)^{1.945}$
H5	$Q = 10.5(Stage - 0.23)^{2.0}$
H7 (low)	$Q = 12(Stage - 8.34)^{2.702}$ for stage <= 8.650
H7 (high)	*$Q = 37.74(Stage - 8.418)^{2.591}$ for stage > 8.650*

Note: Rating equations in this table are applicable to derive the results presented in Tables 3.1-6 to 3.1-9.

Table 3.1-12. Tatelkuz Lake Levels Predicted Monthly Average Changes from Baseline Conditions (m)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operation	-0.03	-0.04	-0.04	-0.04	-0.05	-0.05	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03
Closure	-0.03	-0.04	-0.04	-0.04	-0.05	-0.05	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03
Post-closure	0	0	0	0	0	0	0	0	0	0	0	0

Source: Knight Piésold Ltd. (2014)

Creek 661 Catchment

Description of Hydrological Changes

Creek 661 and its tributaries drain part of the mine site area (i.e., where the open pit and waste dumps will be located; Figure 3.1-1). Flows in Creek 661 will be affected by activities such as re-routing surface water, sediment control ponds, and from groundwater inflows into the open pit. Creek 505659 is a tributary to Creek 661 (Figure 3.1-1). This creek catchment (1-505659; Figure 3.1-2) was included in the watershed model in addition to Creek 661 in part because runoff and toe discharge from the east dump will contribute to flow changes in this catchment (Knight Piésold Ltd. 2013).

The watershed model for the Creek 661 catchment included the following sub-catchments (with corresponding areas) reported in Tables 3.1-3 to 3.1-6: H1 (8.87 m^2), 1-505659 (14.50 m^2), and 1-661 (32.89 m^2). The open pit will serve as a groundwater sink, resulting in decreased streamflows in reaches 1 to 4 of Creek 661 during operation and closure. Average annual streamflows are predicted to decrease by 2 L/s within the H1 sub-catchment due to groundwater inflows to the open pit (see Figure 3.1-2 for catchment locations). Tables 3.1-7 to 3.1-10 indicate how the change in water level will be very small, ranging from no change to a 2 cm change on a monthly basis. Average annual streamflow in the 1-505659 sub-catchment (including Creek 505659 reaches in Table 3.1-1) is estimated to decrease by 21 L/s due to groundwater inflows to the open pit and a reduction in surface drainage area associated with construction of the open pit and the southern portion of the TSF. A similar streamflow reduction is expected for the node farther downstream, 1-661. The largest changes are predicted to occur in the Creek 661 watershed during the closure phase. Closure flows in June are predicted to be -1% at H1, -60% at 1-505659 and -19% at 1-661 (Table 3.1-5). Closure winter low flows are predicted to decrease by 25-67% from December through March at H1 and 1-505659 (Knight Piésold Ltd. 2013). Table 3.1-9 indicates how these changes are predicted to cause less than 1 cm drops at H1 and about a 3 cm drop at H5 on Creek 661 on an average annual basis.

Relation of Hydrological Changes to MWWO Screening of Reaches

The MWWO (2009) screening (Table 3.1-1) found that the downstream reaches (1 to 4) of Creek 661 and reaches 1 to 3 of Creek 505659 are deemed to be ***non-minor*** waters, while reach 4 of Creek 505659 has been deemed to be ***minor***. These downstream reaches are not directly affected by Project works, and will not be influenced by TSF activities related to potential applicability of s.22 of the NWPA Prohibited Activities, therefore these reaches are *not* assessed further regarding their navigability.

Creek 705 Catchment

Description of Hydrological Changes

Redirecting streamflow from the 11-DC sub-catchment (Figure 3.1-2) upslope of the TSF in the Davidson Creek headwaters to the Creek 705 headwaters is predicted to result in an increase in streamflows along Creek 705. The increase in Creek 705 streamflows will begin during construction and continue through to post-closure (Knight Piésold Ltd. 2013).

The watershed model for the Creek 705 catchment included the following sub-catchments (with corresponding areas) reported in Tables 3.1-3 to 6: 6-705 (4.01 m^2), 4-705 (10.31 m^2), H7 (27.79 m^2), and 1-705 (3.14 m^2). The increase in flow in Creek 705 as a result of the coffer dam, and diversion ditch to re-direct flows towards the Creek 705 sub-catchment will be most pronounced at the outlet of Lake 01538EUT (node 6-705) with an estimated model average annual increase of 56% at 6-705 (Tables 3.1-3 to 3.1-6). The predicted increase in flow diminishes progressively downstream along Creek 705, to a level of +5% at the lowest modelled node on this creek, 1-705. Post closure winter low flows in the Creek 705 catchment are predicted to experience the largest increases in flow, with a 100-300% increase between December and January at 6-705. May and June flows are predicted to change less post-closure, increasing by 41-65% (Knight Piésold Ltd. 2013). Tables 3.1-7 to 10 provide projected flow changes for H7 in Creek 705 from construction to post-closure; changes for this sub-catchment correspond to about a maximum 1 cm level change.

Relation of Hydrological Changes to MWWO Screening of Reaches

The MWWO (2009) screening found that Lake 01538EUT in the Creek 705 headwaters is a ***non-minor*** water (Table 3.1-1). Similar to the case for Creek 661, since Creek 705 reaches are downstream of the fish habitat compensation works, and they are not associated with potential applicability of s.22 of the NWPA Prohibited Activities, these reaches are *not* assessed further regarding their navigability.

Chedakuz Creek Catchment

Description of Hydrological Changes

Chedakuz Creek receives water from Davidson Creek as well as from Tatelkuz Lake. Chedakuz Creek streamflows at node H5 was calculated external to the watershed models. Reach 15 of Chedakuz Creek receiving outflow from Tatelkuz Lake (15-CC; Figure 3.1-2), will experience a decrease in streamflow from the operation phase through to closure, due to the withdrawal of water from Tatelkuz Lake by the freshwater supply system (Table 3.1-3 to 3.1-6). Downstream of the outlet of Davidson Creek into Chedakuz Creek (H5) the decrease will be slightly less due to the augmentation of flows through the freshwater supply mitigation system inputs in Davidson Creek.

End of mine streamflows in June are predicted to decrease by 17% at H5 and 18% at 15-CC. December to February winter low flows at end of mine are predicted to decrease by 12-13% at H5 and 15-17% at 15-CC. During post-closure, flows in Chedakuz Creek will return to normal, with negligible to low flow changes predicted as shown in Table 3.1-6 (Knight Piésold Ltd. 2013).

Relation of Hydrological Changes to MWWO Screening of Reaches

The affected reaches of Chedakuz Creek have been deemed to be ***non-minor*** waters in the MWWO Screening (Table 3.1-1). Since Chedakuz Creek is downstream of Davidson Creek, it is implicated in the potential applicability of s.(22) provisions regarding Prohibited Activities of the NPA from the point where Davidson Creek meets Chedakuz, and so will be included in a navigability assessment based on common-law criteria.

Tatelkuz Lake

Description of Hydrological Changes

Tatelkuz Lake is planned as the source of freshwater to mitigate streamflows magnitudes on Davidson Creek; water will be transported from the lake via the freshwater supply pipeline to the freshwater reservoir (Figure 3.1-3). The predicted average annual changes to Tatelkuz Lake levels, as shown in Table 3.1-12, are deemed to be negligible and within the natural fluctuations experienced by the lake seasonally. These negligible changes are not deemed to trigger s.23 of the NPA on dewatering a navigable water, since dewatering is interpreted to mean drying of the navigable water.

Relation of Hydrological Changes to MWWO Screening of Reaches

To avoid double counting, Tatelkuz Lake has not been included in the mine site and downstream MWWO screening in Table 3.1-1; instead it is included in the MWWO screening regarding the proposed off-site water intake (FSS-000) as part of the freshwater supply pipeline (Figure 2.1-3; Table 3.1-3), where it has been found to be a ***non-minor*** water. For this reason Tatelkuz Lake will be included in the navigability assessment based on jurisprudence criteria.

3.1.2 Off-site Project Works

Table 3.1-13 provides the minor works and waters screening for the Project components which are primarily off-site, including the proposed transmission line and its re-routes, the mine access road (MAR), the water supply pipeline, the airstrip road, and the FSR upgrades. Off-site works (including aerial cables, and freshwater pipeline crossings) were assessed according to the amended Minor Works Order (Department of Transport 2014) criteria for designated works under the NPA (Section 2.1). Waterways were assessed under the previous MWWO (2009)using both the first and second tests for minor waters (Section 2.2). Results of the MWWO minor waters screening for off-site linear component works are illustrated in Figures 3.1-3 to 3.1-8.

Appendix B provides standard engineering design drawings of crossing works (i.e., aerial cable, bridge, water supply pipeline), as well as the water intake pipe schematic in Tatelkuz Lake.

3.1.2.1 Transmission Line and Alternative Re-routes

59 aerial crossings are assessed as minor works or waters under the MWWO (2009) screening summarized in Table 3.1-13: 52 for the transmission line, 4 for the Mills Ranch re-route, and 3 for the Stellako re-route. Many of these aerial cable crossings (51 along the transmission line (consisting of all crossings except that over the Nechako River), 4 along the Mills Ranch re-route alternative, and 3 along the Stellako re-route alternative) qualify as ***minor*** works (Section 2.1.1.1) under the Minor Works Order because the width of the navigable waters over or across the transmission line is less than 30 m, and the works are not over a lake. In addition, 38 aerial crossings (34 transmission line crossings, 3 Mills Ranch re-route crossings, and 1 Stellako re-route crossing) have been found to be ***minor*** waters (Table 3.1-13; Figures 3.1-3 to 3.1-8).

The screening of minor works under the Minor Works Order and the old MWWO minor waters criteria leaves only the Nechako River (TL-1065) crossing as being neither a minor work or water. The Stellako River (TL-937 and SR-003) is a waterway with established navigation, so even though the works over this non-minor water are deemed minor under the Minor Works Order amended criteria (Section 2.1.1.1), this water will be assessed using jurisprudence criteria. Plates 19 to 33 (Appendix C) provide photos of the non-minor waters crossed by these aerial crossings. The Nechako rivers has a width exceeding 30 m (Table 3.1-13) and doesn't trigger any of the other Minor Works Order criteria, so it is not deemed to be minor.

3.1.2.2 Access Roads

Kluskus-Ootsa Forest Service Road Upgrades

There is one bridge crossing (AE-914) anticipated along the km 102-124 Kluskus-Ootsa FSR stretch of upgrades that was assessed (Table 3.1-13). Since bridges cannot be minor works, this work has not been deemed minor; however, this section of an unnamed creek was found to be a ***minor*** water under the criteria for the MWWO (2009) initial review test.

Mine Access Road

None of the four bridge crossings along the MAR can be considered minor works; however all the bridges will be clear span (AMEC 2014). The MWWO (2009) screening assessment (Table 3.1-13) found that two of the MAR crossing sites are over ***minor*** waters (AP-005 and AP-905) using the secondary review test (Section 2.2.1.1), while the two other crossings are over ***non-minor*** waters: AP-004 over Davidson Creek and AP-007 over Turtle Creek (Plates 34 and 35 in Appendix C).

Air Strip Road

One crossing was assessed along the air strip road (the other two being NVC, Appendix A). This water crossing will have a bridge crossing if it is found out that the stream is fish bearing; if not, the crossing work will be a culvert. The unnamed creek at this crossing (AA-002) was found to be a ***minor*** water through the initial review test in the MWWO screening (Table 3.1-13).

3.1.2.3 Freshwater Supply Pipeline

For the freshwater supply system to the Project from Tatelkuz Lake, nine works were assessed (Table 3.1-13), which include the water intake at Tatelkuz Lake (FSS-000, illustrated in Appendix B engineering drawings), seven crossings involving what are currently assumed to be buried pipelines (FSS-001, FSS-005 (Appendix C Plate 37), FSS-006, FSS-007, and FSS-009), and three combined buried pipeline with a bridge upgrade along the existing resource road (FSS-002, FSS-003 [Appendix C, Plate 36], and FSS-008 [Appendix C, Plate 38]). Of these, the five pipeline crossings have been deemed to be ***minor*** under the Minor Works Order criteria (Section 2.1.1.1), and the three paired with the bridge upgrades and the water intake pipe are deemed to involve ***non-minor*** works due to the presence of the bridges.

For the water assessment, five of the nine crossings have been deemed to be ***minor*** waters (two through the initial review test and three through the second), leaving four as non-minor (Table 3.1-13). Plates 36 to 38 (Appendix C) illustrate the non-minor creek crossings. In total, seven crossings have been screened out as ***minor*** works or waters, leaving Tatelkuz Lake (water intake pipe at FSS-000), and two crossings involving bridge upgrades (FSS-003 and FSS-008) as ***non-minor***.

Table 3.1-13. Stream Crossing Minor Works and Waters Assessment for Project Transmission Line, Access Roads, and Freshwater Pipeline

Stream Information						Works Evaluation		Waters Evaluation						
Project Component	Site ID	Water	UTM	Latitude/ Longitude	Plate No.[1]	Type of Work Crossing	Minor Work?	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[2]	Minor Water?	as MWO Minor Work or MWWO Minor Water
Transmission Line	TL-004	Davidson Ck.	378937 E 5900138 N	53.2367°N 124.814°W	19	Aerial Cable	Yes	6.5	0.46	1.5	1.27	3	No	Yes
	TL-023	Esker Ck.	395861 E 5920724 N	53.4253°N 124.5673°W	-	Aerial Cable	Yes	2.3	0.5	3	ns	ns	Secondary	Yes
	TL-025	Big Bend Ck.	397313 E 5922083 N	53.4378°N 124.5459°W	20	Aerial Cable	Yes	4.2	0.46	2	1.05	5	No	Yes
	TL-026	Unnamed Ck.	398231 E 5922544 N	53.4421°N 124.5322°W	-	Aerial Cable	Yes	1.1	0.56	2.5	ns	ns	Initial	Yes
	TL-048	Unnamed Ck.	388007 E 5940053 N	53.5973°N 124.6923°W	-	Aerial Cable	Yes	1.23	0.70	3	ns	ns	No	Yes
	TL-054	Swanson Ck.	391997 E 5946283 N	53.6541°N 124.6342°W	21	Aerial Cable	Yes	3.4	0.57	4	ns	ns	No	Yes
	TL-067	Unnamed Ck.	397350 E 5956570 N	53.7476°N 124.5566°W	-	Aerial Cable	Yes	0.9	0.43	2.5	ns	ns	Initial	Yes
	TL-112	Unnamed Ck.	376172 E 5985287 N	54.001°N 124.8892°W	-	Aerial Cable	Yes	1.7	0.53	5	ns	ns	Secondary	Yes
	TL-121	Unnamed Ck.	371105 E 5989335 N	54.0361°N 124.9682°W	-	Aerial Cable	Yes	1	1	26	ns	ns	Initial	Yes
	TL-917	Unnamed Ck.	387970 E 5909923 N	53.3266°N 124.6821°W	-	Aerial Cable	Yes	2.6	0.55	2.5	1.27	5	Secondary	Yes
	TL-937	Stellako R.	371321 E 5989026 N	54.0334°N 124.9648°W	22	Aerial Cable	Yes	25*	ns	ns	ns	ns	No	Yes***
	TL-951†	Unnamed Ck.	378320 E 5895665 N	53.1964°N 124.8215°W	-	Aerial Cable	Yes	1.7	0.62	1	ns	ns	No	Yes
	TL-952	Unnamed Ck.	378494 E 5896661 N	53.2054°N 124.8193°W	-	Aerial Cable	Yes	1.6	0.45	3.8	1.05	3	Secondary	Yes
	TL-955	Unnamed Ck.	379135 E 5901580 N	53.2497°N 124.8115°W	-	Aerial Cable	Yes	1.2	0.33	6.3	1.12	3	Secondary	Yes
	TL-958	Turtle Ck.	379037 E 5906127 N	53.2905°N 124.8147°W	23	Aerial Cable	Yes	3.2	0.76	1.5	1.64	0	No	Yes
	TL-961	Unnamed Ck.	389758 E 5912997 N	53.3546°N 124.6564°W	-	Aerial Cable	Yes	1.95	0.43	2.5	ns	ns	Secondary	Yes
	TL-962	Unnamed Ck.	390329 E 5913918 N	53.363°N 124.6481°W	-	Aerial Cable	Yes	0.95	0.4	6.5	ns	ns	Initial	Yes
	TL-969	Big Bend Ck.	397906 E 5927089 N	53.4829°N 124.5386°W	24	Aerial Cable	Yes	7.5	0.5	2.5	ns	9	No	Yes
	TL-970	Unnamed Ck.	395992 E 5930875 N	53.5165°N 124.5686°W	-	Aerial Cable	Yes	1.1	0.45	2	ns	ns	Initial	Yes
	TL-973	Big Bend Ck.	393887 E 5933122 N	53.5363°N 124.6011°W	25	Aerial Cable	Yes	5.7	0.78	1.5	1.7	12	No	Yes
	TL-975	Unnamed Ck.	393243 E 5934743 N	53.5507°N 124.6114°W	-	Aerial Cable	Yes	2.82	0.6	2	ns	8	Secondary	Yes
	TL-977	Unnamed Ck.	391072 E 5937188 N	53.5722°N 124.645°W	-	Aerial Cable	Yes	1.12	0.37	12.5	ns	ns	Initial	Yes
	TL-980	Unnamed Ck.	390160 E 5937755 N	53.5771°N 124.659°W	-	Aerial Cable	Yes	0.81	0.27	2.5	ns	ns	Initial	Yes
	TL-985	Unnamed Ck.	393221 E 5948783 N	53.6768°N 124.6166°W	-	Aerial Cable	Yes	1.53	0.54	3.3	ns	ns	Secondary	Yes
	TL-992	Unnamed Ck.	394812 E 5953129 N	53.7162°N 124.594°W	-	Aerial Cable	Yes	1.2	0.37	1.5	ns	ns	Secondary	Yes
	TL-1006	Unnamed Ck.	391796 E 5963829 N	53.8117°N 124.6434°W	-	Aerial Cable	Yes	1.3	0.4	4	ns	ns	Secondary	Yes
	TL-1007	Unnamed Ck.	391653 E 5964199 N	53.815°N 124.6457°W	-	Aerial Cable	Yes	1.18	0.62	2.5	ns	ns	Initial	Yes
	TL-1010	Unnamed Ck.	390839 E 5966319 N	53.8339°N 124.6588°W	-	Aerial Cable	Yes	1.05	0.43	2.5	ns	ns	Initial	Yes
	TL-1011	Unnamed Ck.	390777 E 5966480 N	53.8353°N 124.6598°W	-	Aerial Cable	Yes	0.73	2.67	1.5	ns	ns	Initial	Yes
	TL-1021	Tahultzu Ck.	390749 E 5970935 N	53.8754°N 124.6618°W	26	Aerial Cable	Yes	6.5	0.6	2	ns	1	No	Yes
	TL-1024	Unnamed Ck.	388040 E 5973563 N	53.8984°N 124.704°W	-	Aerial Cable	Yes	2.09	0.33	0.5	ns	ns	Secondary	Yes
	TL-1025	Fifteen Ck.	387563 E 5974040 N	53.9026°N 124.7114°W	-	Aerial Cable	Yes	3	0.47	2.5	ns	39	Secondary	Yes
	TL-1026	Unnamed Ck.	387073 E 5975092 N	53.9119°N 124.7192°W	-	Aerial Cable	Yes	1.32	0.47	5.5	ns	ns	Secondary	Yes
	TL-1029	Smith Ck.	386473 E 5976842 N	53.9275°N 124.729°W	-	Aerial Cable	Yes	3.4	0.6	4.5	1.18	28	No	Yes
	TL-1030	Unnamed Ck.	386285 E 5978055 N	53.9384°N 124.7323°W	-	Aerial Cable	Yes	1.7	0.2	1.5	ns	ns	Initial	Yes
	TL-1036	Unnamed Ck.	383813 E 5983240 N	53.9844°N 124.7719°W	-	Aerial Cable	Yes	1.27	0.47	1.5	ns	ns	Secondary	Yes
	TL-1042	Unnamed Ck.	380453 E 5985380 N	54.0029°N 124.824°W	-	Aerial Cable	Yes	1.48	0.53	3.5	ns	ns	Secondary	Yes
	TL-1043	Unnamed Ck.	379624 E 5985810 N	54.0065°N 124.8368°W	-	Aerial Cable	Yes	1.15	0.4	5	ns	ns	Initial	Yes
	TL-1046	Unnamed Ck.	378903 E 5985641 N	54.0048°N 124.8477°W	-	Aerial Cable	Yes	1.97	0.87	6	ns	ns	Secondary	Yes
	TL-1050	Unnamed Ck.	376524 E 5985138 N	53.9998°N 124.8838°W	-	Aerial Cable	Yes	0.88	0.37	7.5	ns	ns	Initial	Yes
	TL-1052	Unnamed Ck.	370180 E 5990459 N	54.046°N 124.9828°W	-	Aerial Cable	Yes	1.02	0.43	9	ns	ns	Initial	Yes
	TL-1057	Unnamed Ck.	382716 E 5908851 N	53.3158°N 124.7606°W	27	Aerial Cable	Yes	3.9	0.77	1.5	1.09	4	No	Yes
	TL-1058	Unnamed Ck.	383308 E 5909163 N	53.3188°N 124.7518°W	28	Aerial Cable	Yes	3.3	0.37	1	1.14	4	No	Yes

(continued)

Table 3.1-13. Stream Crossing Minor Works and Waters Assessment for Project Transmission Line, Access Roads, and Freshwater Pipeline (completed)

Stream Information						Works Evaluation		Waters Evaluation						MWWO Result Exempt as Minor Work or Water
Project Component	Site ID	Waterbody	UTM	Latitude/ Longitude	Plate No.[1]	Type of Work Crossing	Minor Work?	Mean BfW (m)	Mean BfD (m)	Mean Gradient (%)	Sinuosity	Blockages[2]	Minor Water?	
Transmission Line *(cont'd)*	TL-1059	Unnamed Ck.	388913 E 5942791 N	53.6221°N 124.6796°W	-	Aerial Cable	Yes	2.33	0.64	2.5	ns	ns	No	Yes
	TL-1063	Unnamed Ck.	397148 E 5960394 N	53.782°N 124.561°W	-	Aerial Cable	Yes	0.79	0.4	3.5	ns	ns	Initial	Yes
	TL-1064	Greer Ck.	396245 E 5962001 N	53.7962°N 124.5752°W	29	Aerial Cable	Yes	12.52	1.3	2.5	ns	ns	No	Yes
	TL-1065	Nechako R.	394094 E 5962069 N	53.7964°N 124.6079°W	30	Aerial Cable	No	90*	ns	ns	ns	ns	No	No
	TL-1066	Unnamed Ck.	393456 E 5962121 N	53.7967°N 124.6176°W	-	Aerial Cable	Yes	0.67	0.37	6.5	ns	ns	Initial	Yes
	TL-1067	Unnamed Ck.	393189 E 5962178 N	53.7972°N 124.6217°W	-	Aerial Cable	Yes	0.67	0.37	6.5	ns	ns	Initial	Yes
	TL-1077	Unnamed Ck.	368859 E 5992869 N	54.0673°N 125.004°W	-	Aerial Cable	Yes	1.8	0.72	3	ns	ns	No	Yes
	TL-1078	Chedakuz Ck.	383923 E 5909432 N	53.3213°N 124.7427°W	31	Aerial Cable	Yes	12.1	0.93	3	1.1	0	No	Yes
	TL-1081	Unnamed Ck.	386128 E 5909498 N	53.3224°N 124.7096°W	-	Aerial Cable	Yes	0.6	0.2	4.5	ns	ns	Initial	Yes
Mills Ranch Transmission Line Re-route (Alternative)	MR-002	Chedakuz Ck.	380214 E 5910902 N	53.3337°N 124.7989°W	32	Aerial Cable	Yes	12	0.7	3	ns	0	No	Yes
	MR-003	Unnamed Ck.	380847 E 5911485 N	53.3391°N 124.7896°W	-	Aerial Cable	Yes	0.6	0.37	1.5	ns	ns	Initial	Yes
	MR-004	Unnamed Ck.	383344 E 5911565 N	53.3404°N 124.7522°W	-	Aerial Cable	Yes	0.84	0.4	2.5	ns	ns	Initial	Yes
	MR-010	Unnamed Ck.	387848 E 5913537 N	53.359°N 124.6852°W	-	Aerial Cable	Yes	2.38	0.53	1.5	ns	8	Secondary	Yes
Stellako Transmission Line Re-route (Alternative)	SR-003	Stellako R.	371520 E 5990351 N	53.7964°N 124.6079°W	33	Aerial Cable	Yes	21*	ns	ns	ns	ns	No	Yes***
	SR-004	Unnamed Ck.	371311 E 5990541 N	54.047°N 124.9656°W	-	Aerial Cable	Yes	1.02	0.43	9	ns	ns	Initial	Yes
	SR-009	Unnamed Ck.	369044 E 5993214 N	54.0705°N 125.0013°W	-	Aerial Cable	Yes	1.8	0.72	3	ns	ns	No	Yes
Kluskus-Ootsa FSR (Kms 102-124 Upgrade)	AE-914	Unnamed Ck.	395724 E 5911611 N	53.3434°N 124.5663°W	-	Bridge Upgrade	No	1.13	0.33	11	ns	2	Initial	Yes
Mine Access Road (MAR)	AP-004	Davidson Ck.	378962 E 5900138 N	53.2367°N 124.8136°W	34	Bridge	No	6.5	0.46	1.5	1.27	3	No	No
	AP-005	Unnamed Ck.	379062 E 5901517 N	53.2491°N 124.8126°W	-	Bridge	No	1.2	0.33	6.3	1.12	3	Secondary	Yes
	AP-007	Turtle Ck.	378796 E 5905952 N	53.2889°N 124.8183°W	35	Bridge	No	3.2	0.76	1.5	1.64	0	No	No
	AP-905	Unnamed Ck.	378803 E 5896992 N	53.2084°N 124.8148°W	-	Bridge	No	1.93	0.5	1.5	ns	ns	Secondary	Yes
Airstrip Access Road	AA-002	Unnamed Ck.	378594 E 5904942 N	53.2798°N 124.8209°W	-	Bridge	No	1.12	0.57	3.5	ns	ns	Initial	Yes
Freshwater Supply Pipeline (Including water intake and existing road listed upgrades)	FSS-000	Tatelkuz Lk.	389355 E 5902935 N	53.2641°N 124.6589°W	-	Pipeline Water Intake	No	927**	ns	ns	ns	ns	No	No
	FSS-001	Unnamed Ck.	387434 E 5902719 N	53.2618°N 124.6876°W	-	Pipeline	Yes	2.05	0.85	3.4	ns	28	Secondary	Yes
	FSS-002	Unnamed Ck.	387136 E 5902655 N	53.2611°N 124.6921°W	-	Pipeline and Bridge[3]	No	2.1	0.47	0.98	ns	41	Secondary	Yes
	FSS-003	Unnamed Ck.	385863 E 5902992 N	53.2639°N 124.7113°W	36	Pipeline and Bridge[4]	No	4.47	1	1.4	ns	4	No	No
	FSS-005	Ck. 704454	375417 E 5895470 N	53.1939°N 124.8648°W	37	Pipeline	Yes	3.47	0.42	7.17	ns	49	No	Yes
	FSS-006	Unnamed Ck.	385248 E 5902969 N	53.2635°N 124.7205°W	-	Pipeline	Yes	0.3	0.28	0.23	ns	1	Initial	Yes
	FSS-007	Ck. 505659	376283 E 5895524 N	53.1946°N 124.8519°W	-	Pipeline	Yes	1.34	0.23	2.5	2	43	Initial	Yes
	FSS-008	Unnamed Ck.	382740 E 5902701 N	53.2606°N 124.758°W	38	Pipeline and Bridge[5]	No	3.98	0.72	4.2	ns	29	No	No
	FSS-009	Ck. 505659	378855 E 5897009 N	53.2086°N 124.814°W	-	Pipeline	Yes	1.26	0.34	2.5	ns	15	Secondary	Yes

Meets initial review criteria for minor waters | Meets secondary review criteria for minor waters | Minor works or waters | Non-minor

Notes: D/S - downstream; m - metre; Mean BfD - mean bankfull depth; Mean BfW - mean bankfull width; No. - number; ns - not sampled; % - percent; Trib - tributary; TSF - tailings storage facility; U/S - upstream; UTM - Universal Transverse Mercator; Details including site UTMs, watershed number, and navigability notes are available in Appendix A.

[1] Photo numbers refer to Photo Plates in Appendix C; Dash indicates no photo.

[2] Blockages are natural obstructions such as log jams, but does not include large woody debris, which may also affect navigability.

[3] Upgrade from old log bridge to new one.

[4] Bridge will replace 1200 mm culvert on existing road.

[5] Bridge will replace 500 mm culvert on existing road.

[†] Note that crossing TL-951 is a double crossing in almost the same location, for the cable to provide power to the camp across the creek, with the exact same stream data for both; so this has been condensed to one line item in the above table compared to the original data table in Appendix A since this is the same water section and sample site.

GIS based estimate of width as swift water along section made field data collection unsafe; **Surface area (ha) based on GIS estimate; * Under the previous MWWO the Stellako River crossing was not a minor work; though it is deemed to be minor under the Minor Works Order, it will be carried forward to the navigability assessment based on jurisprudence criteria since there is established navigation on this river*

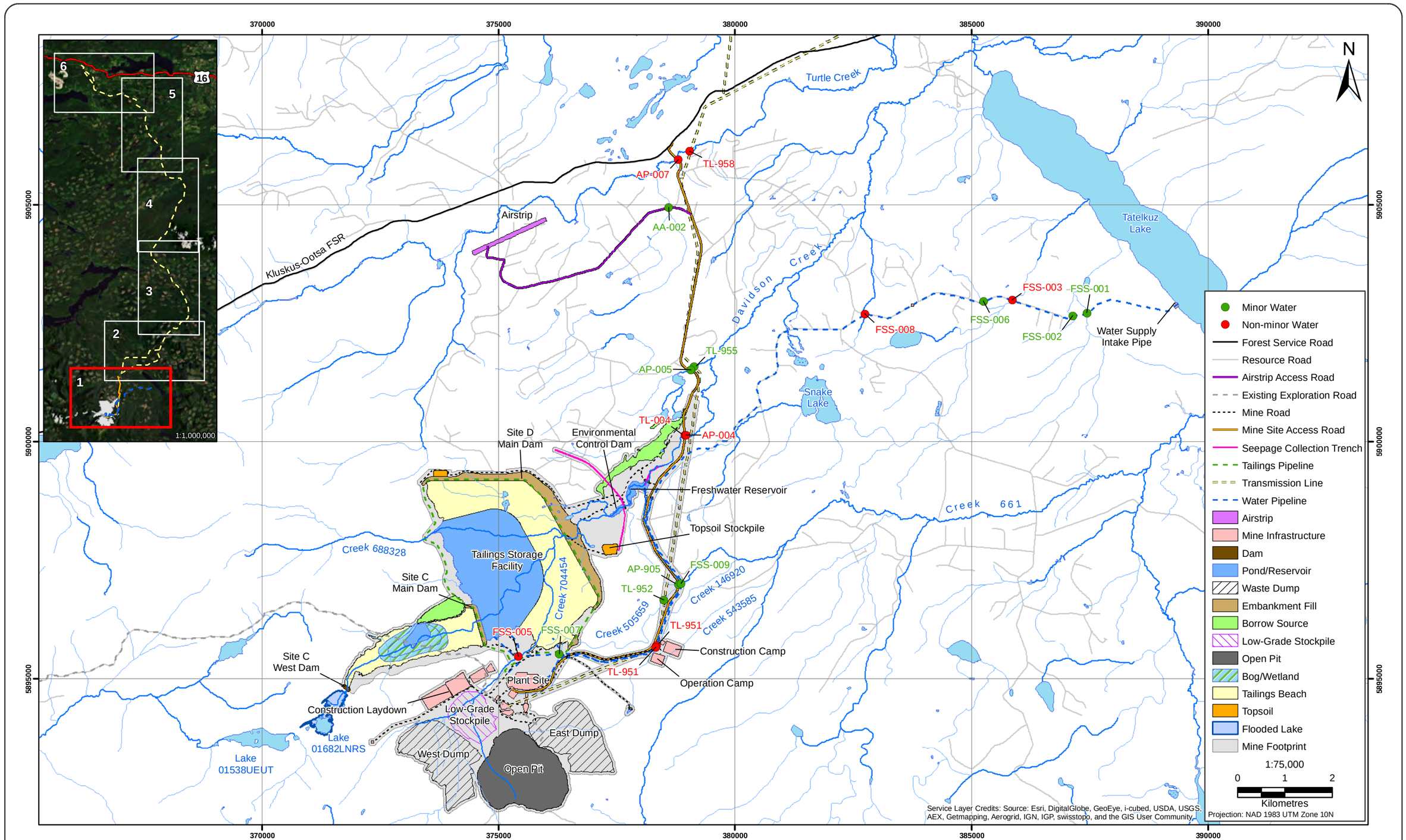

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Figure 3.1-3

Blackwater Gold Project Minor Water Evaluation Map 1 - Mine Site, Water Supply, Mine Access Road, Air Strip Road, and Transmission Line

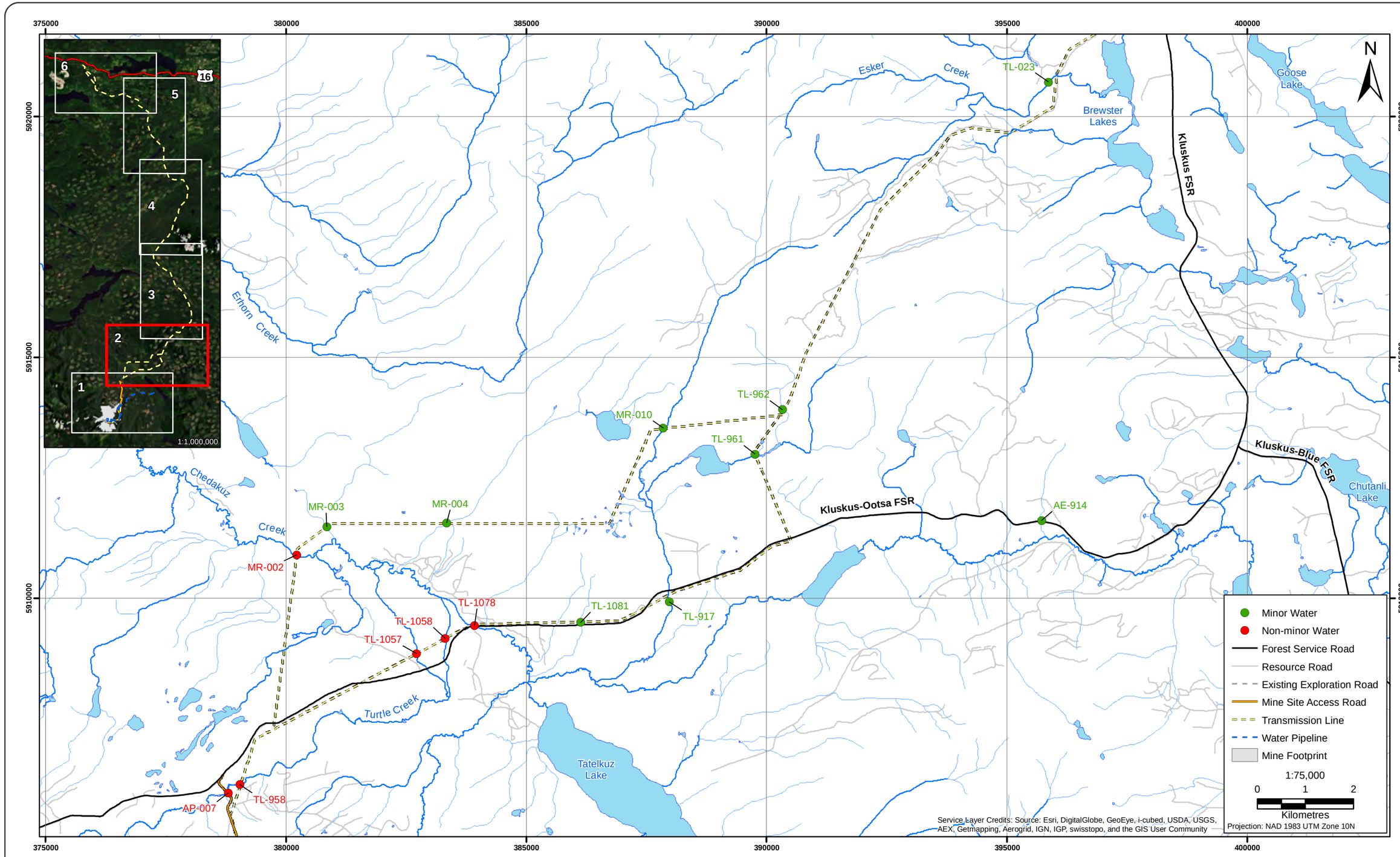

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Figure 3.1-4

Blackwater Gold Project Minor Water Evaluation
Map 2 - Transmission Line and Forest Service Road Upgrade

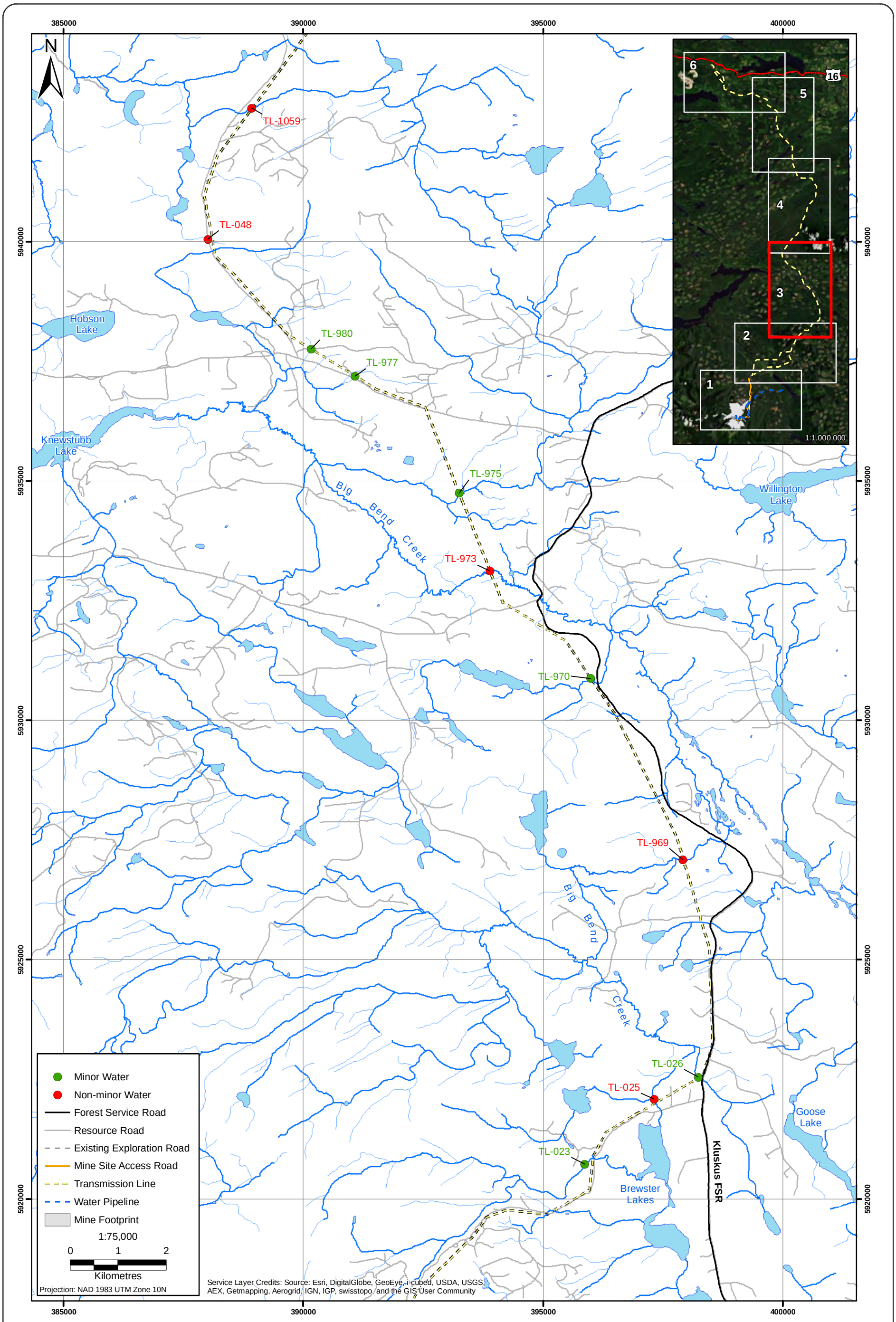

Figure 3.1-5

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Blackwater Gold Project Minor Water Evaluation
Map 3 - Transmission Line

Figure 3.1-5

Rescan an ERM company

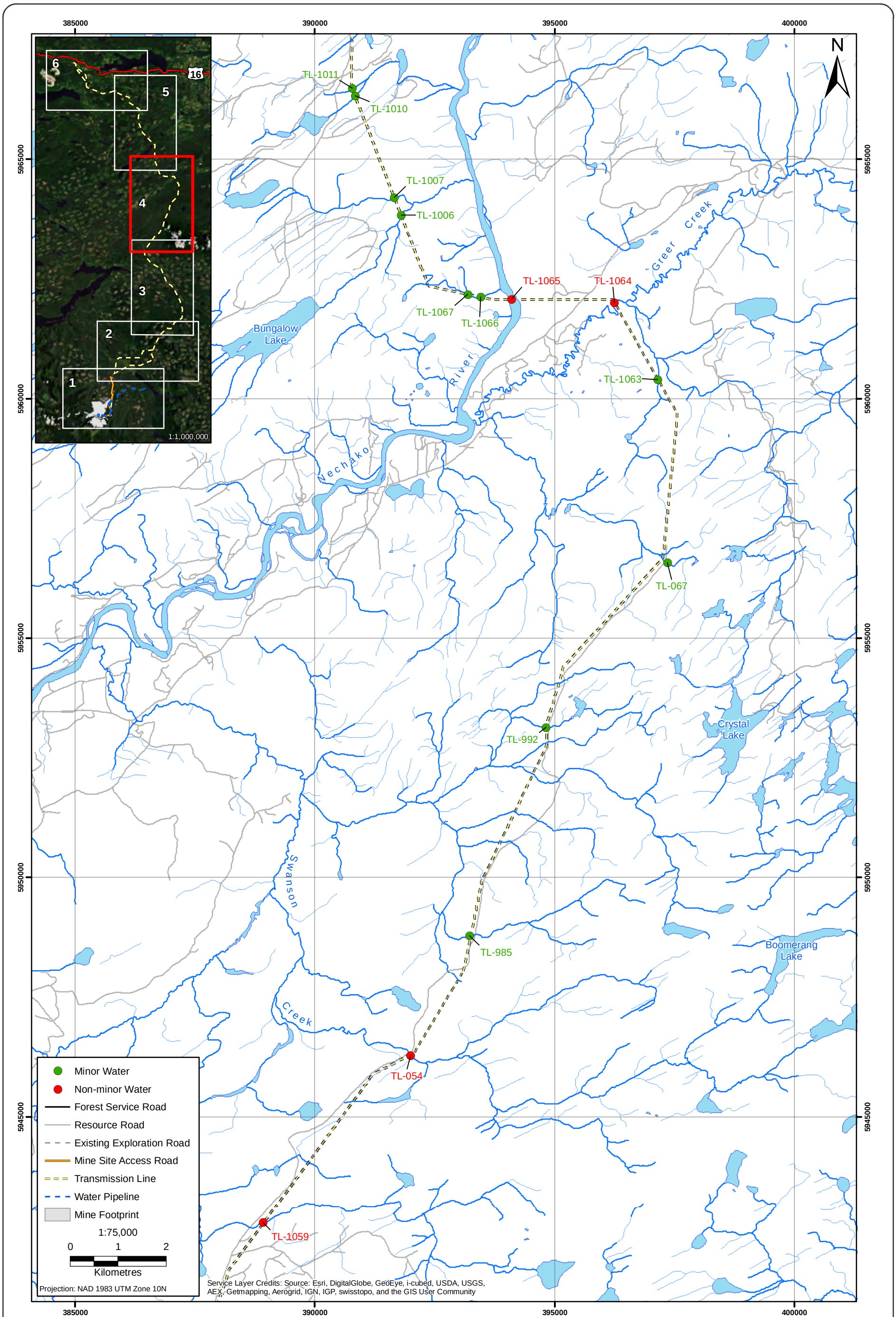

Figure 3.1-6

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Blackwater Gold Project Minor Water Evaluation
Map 4 - Transmission Line

Figure 3.1-6

Rescan an ERM company

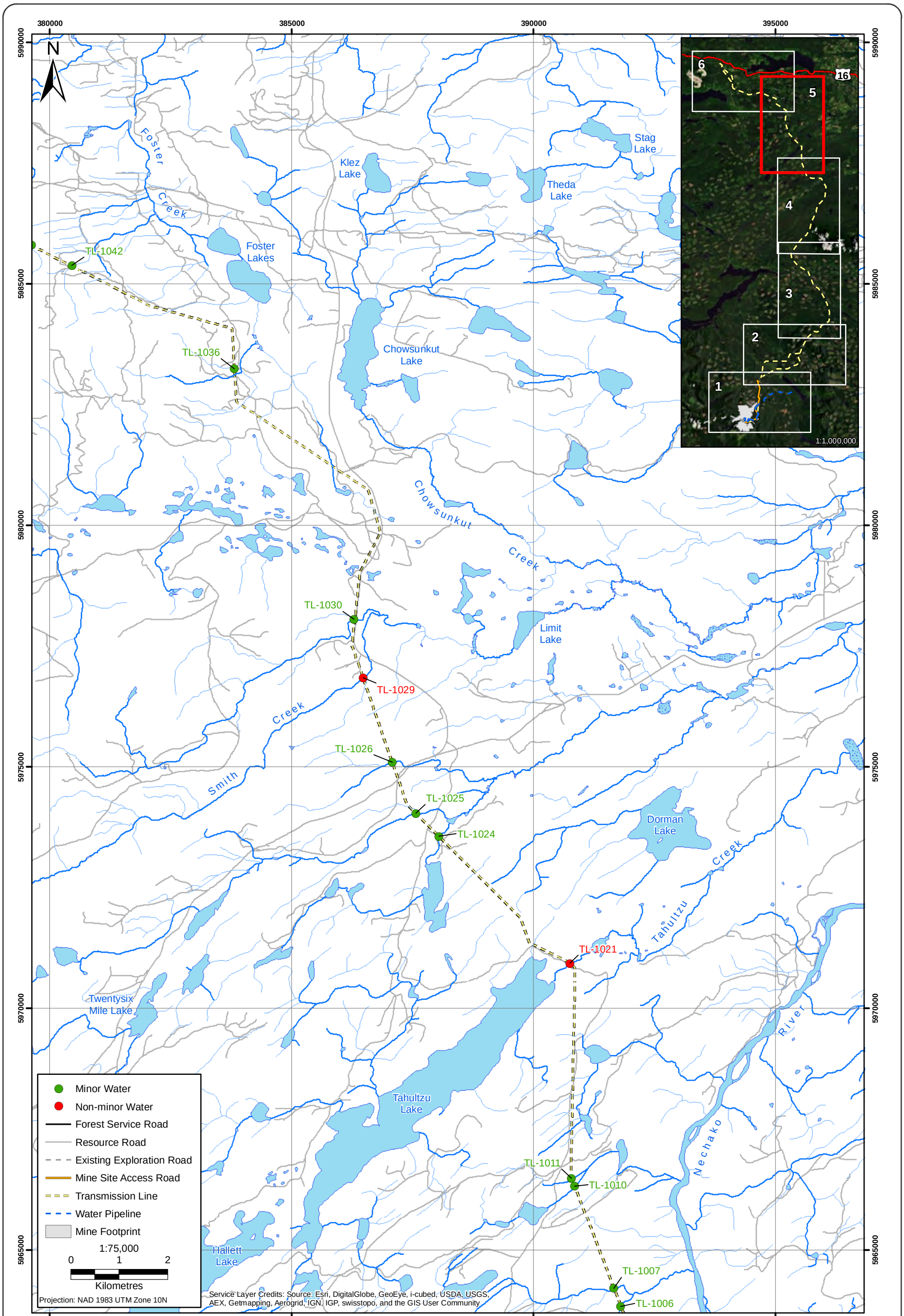

Figure 3.1-7

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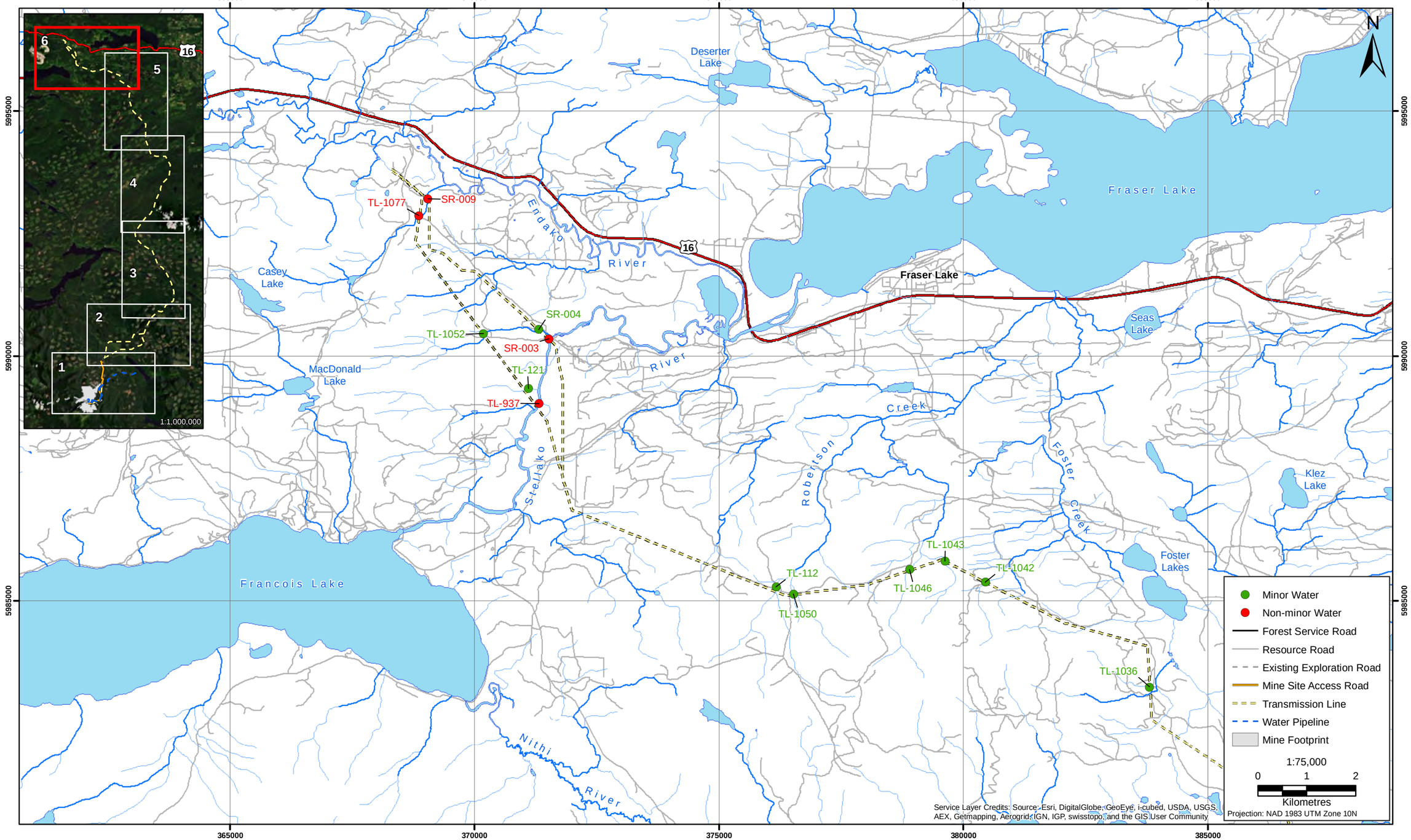
Blackwater Gold Project Minor Water Evaluation
Map 5 - Transmission Line

Figure 3.1-7

Rescan an ERM company



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Rescan an ERM company

Figure 3.1-8

Blackwater Gold Project Minor Water Evaluation
Map 6 - Transmission Line

3.1.2.4 Summary of Off-site Assessment

Table 3.1-14 provides a summary of the minor works assessment under the Minor Works Order (Department of Transport 2014) and old MWWO (2009) assessment of minor waters for linear Project works including the MAR, airstrip road, FSR upgrades, transmission lines (and re-routes), and water supply pipeline including aerial pipeline crossings and service road upgrades. Altogether, out of 74 crossings, 68 have been deemed to be ***minor*** works or waters, leaving 6 as *non-minor*. All of the aerial crossings were deemed to be minor except for the crossing over the Nechako River (TL-065). The seven pipeline crossings were also deemed minor per the current plan to have buried pipelines, although three bridge upgrades paired with the pipeline will be non-minor. In sum, 63 works were found to be ***minor***. For the waters assessment under the old MWWO, of the 74 stream crossings assessed for these off-site works, 47 have been deemed ***minor*** waters (25 through the first review, and 22 through the second review), leaving 27 as ***non-minor***. Waters deemed navigable through the old MWWO assessment are deemed for the purposes of this study to have physical characteristics that would make physical navigation on them reasonably unfeasible. Crossings with minor works or waters will therefore not be scoped into the jurisprudence assessment for navigable waters. The exception is that even though the two aerial crossings over the Stellako River have been found to be minor, these sections of the Stellako River will be assessed using jurisprudence criteria for navigability, since there is established use for navigation on this river.

Table 3.1-14. Summaries of Stream Crossing Assessments for Off-site Project Works

Project Component	Total Crossings	Exempt as Minor Water		Minor Waters	Non-Minor Waters	Minor Works	Minor Work or Water	Final Remaining Non-minor Waters
		Initial	Secondary					
Transmission Line	52	18	16	34	18	51	51	1
Mills Ranch Transmission Line Re-route	4	2	1	3	1	4	4	0
Stellako Transmission Line Re-route	3	1	0	1	2	3	3	0
Kluskus-Ootsa FSR (kms 102 to 124)	1	1	0	1	0	0	1	0
Mine Access Road (MAR)	4	0	2	2	2	0	2	2
Airstrip Access Road	1	1	0	1	0	0	1	0
Freshwater Supply Pipeline	9	2	3	5	4	5	6	3
TOTAL	**74**	**25**	**22**	**47**	**27**	**63**	**68**	**6**

Note: Counts do not include streams surveyed that were deemed to be no visible channel (NVC), which are listed in Appendix A.

In total, 8 off-site work crossings will have waters scoped into the jurisprudence assessment as a result of this minor works and waters assessment: three waters crossed by aerial cables (TL-1065 for the Nechako River and TL-937 and SR-003 for the Stellako River); one on Tatelkuz Lake (FSS-000) for the freshwater supply intake and two pipeline/bridge crossings (FSS-003, FSS-008); and two MAR crossings (AP-007 over Turtle Creek, and AP-004 over Davidson Creek reach 6). The two extra ones from the count of 6 minor works or waters shown in Table 3.1-14 are from the two Stellako River crossings, which will be scoped in even though they have minor aerial cable crossings for the reasons provided above.

4. Conclusions

Project components and affected waters were evaluated regarding which ones constitute minor works under the revised Minor Works Order under the NPA (Department of Transport 2014) and minor waters under the previous MWWO under the old NWPA version of the Act (1985). An assessment of predicted flow changes as a result of the Project was also conducted.

As summarized in Table 3.1-2 and 3.1-14, out of a total of 128 (54 for the mine site and 74 for off-site) stream reaches and crossings directly affected by works assessed for the Project, 98 (30 for the mine site and 68 for off-site) have been found to be ***minor*** works or waters. This assessment leaves 30 (24 for the mine site and 6 for off-site) ***non-minor*** waters that will be scoped into further assessment for navigability based on jurisprudence criteria. In addition to the non-minor waters, two Stellako River crossings (deemed minor works) will be scoped in for further assessment of navigability as this river has established navigation, and the two minor reaches of Davidson Creek (10, 11) that are directly affected by the TSF footprint will also be assessed further using jurisprudence criteria due to potential applicability of s.22 of the NPA.

All of the waters assessed for off-site works will be directly affected by Project works. For the mine site, however; only 8 of the waters deemed to be non-minor will be directly affected by Project works in the mine site footprint (Davidson Creek reaches 6, 7, 7.1, 8, 9, and Creek 7044544 reaches 1,2,3). The rest of the scoped in reaches are either downstream of works (13 reaches) or associated with fish habitat compensation (3).

This report has also provided an assessment of how the Project may affect flows in waters affected by Project mine site activities in Section 3.1.1.3. Changes to levels in Tatelkuz Lake as a result of the freshwater pipeline drawing water from the lake are deemed to negligible since they are within the natural variation in levels of the lake, and so s.23 of the NPA on dewatering is not deemed to be triggered by the Project, though the final determination of applicability remains with TC. Regarding flow changes in the Davidson Creek, Creek 661, Creek 705, and Chedakuz Creek catchments, Tables 3.1-3 to 3.1-6 provide the predicted percent flow changes. Tables 3.1-7 to 3.1-10 provide these flow changes as changes in water level (m) for some of the creek nodes, which show that for any given month, level changes will typically change by only a few cm, which is considered to be a negligible change. The largest change is predicted for H2 on Davidson Creek during May to June in post-closure of 14 to 27 cm, but further downstream at 4HB, this change diminishes for those months to a maximum 3 cm change (Table 3.1-10).

New Gold will provide any extra information requested by Transport Canada to support their review of this report.

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