Mining Industry Questionnaire to Accompany Water License Applications to the Mackenzie Valley Land and Water Board

Mackenzie Valley Land and Water Board
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Regulating the use of land and waters and the deposit of waste, and enabling residents to participate in the management of resources to provide optimum benefit to the residents of the settlement areas and of the Mackenzie Valley and to all Canadians.

October 2003

The purpose of this questionnaire is to solicit supplemental information from an applicant to support his/her application for a water licence (or renewal). It is anticipated that the completion of this questionnaire will reduce delays arising from the Board having to solicit additional information after an application has already been submitted. This information will also be useful during the pre-screening of your application, which must be undertaken prior to development and approval of a water licence to determine if the project needs to be referred to the Environmental Impact Review Board.

The applicant should complete the questionnaire to the best of his/her ability, recognizing that some questions may not be relevant to the project under consideration. For questions that do not relate to his/her operation, the applicant is requested to indicate “N/A” (Not Applicable).

If any questions arise while completing the questionnaire, the applicant may wish to contact the Mackenzie Valley Land and Water Board at (867) 669-0506.

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PLEASE PRINT OR TYPE YOUR RESPONSES

NOTE If space is insufficient for any of the responses on this questionnaire, use the back of the sheet or an attachment.

SECTION 1 – GENERAL

Date: December 15, 2013

1.1 Applicant

1. Name and Mailing Address of Applicant	**2. Address of Head Office in Canada if Incorporate**
De Beers Canada Inc. #300 5120 – 49th Street Yellowknife, Northwest Territories X1A 1P8 Telephone: (867) 766 7300 Fax: (867) 766-7347	De Beers Canada Inc. 900-250 Ferrand Drive Toronto, Ontario M3C 3G8 Telephone: (416) 645 1710 Fax: (416) 429 2462

Property Name: Snap Lake Mine
Closest Community: Yellowknife, NT
Latitude/Longitude: 63° 35' 30"/ 110° 52' 00"

1.2 Environmental Contact:
Erica Bonhomme
Environmental Manager
(867) 766-7331

Alexandra Hood
Permitting/Environmental Superintendent
(867) 766- 7308

1.3 Indicate the status of the mine and/or mill on the date of application. (check the appropriate space) Mine Mill
Both the mine and the mill are in operation.

1.4 If a change in the status of the mine or mill is expected, indicate the nature and anticipated date of such change.
N/A

1.5 Indicate the present (or proposed) mine/mill operating schedule.
Mine and Mill
24 hours per day
7 days per week
52 weeks per year
12 hr shift periods
400 number of employees at site

1.6 Attach a detailed map drawn to scale showing the relative locations of the (proposed) mine, mill, water treatment facilities, sewage and solid waste facilities, and tailings areas. The plan should include the water intake and pumphouse, fuel and chemical storage facilities, any existing and proposed concentrate, ore and waste rock storage piles, any existing and proposed drainage controls, piping distribution systems, gas, electric and water utility route locations, and transportation access routes around the site. The map also should include elevation contours, waterbodies and an indication of drainage patterns for the area.
As this is an amendment application, only maps directly associated with the proposed amendments to water management are attached to this document.

1.7 If applicable, provide a brief history of property development which took place before the present company gained control of the site. Include shafts, adits, mills (give rated capacity, etc.), waste dumps, chemical storage areas, tailings disposal areas and effluent discharge locations. Make references to the detailed map.
N/A

1.8 Give a short description of the proposed or current freshwater intake facility, the type and operating capacity of the pumps used and the intake screen size.

Snap Lake Mine has two intake facilities, authorized for the life of the mine by the Department of Fisheries and Oceans Canada (SC00196) and to June 2020 under MV2011L2-0004.

PRIMARY INTAKE

The system consists of a water intake pump well housed in a rock filled embankment constructed on the north shore of the northwest peninsula of Snap lake. The pump well consists of a vertical pump wells fitted with vertical turbine pumps and receives water through a single intake pipe buried beneath the rock filled granite embankment. A Johnson Intake Screen System model S-54 cylindrical stainless steel #60 wedge wire screen with a slot opening width of 2.50mm and total screen area of 6.79m^2 is used to protect fish.

CONTINGENCY INTAKE

The contingency intake is also on the north shore of the northwest peninsula of Snap lake. The intake is a perforated end-of-pipe design. The perforations are 14 mm in diameter. A stainless steel #8 mesh wire (2.54 mm) cloth is wrapped around the intake box. The pumping system consists of two centrifugal pumps in parallel. These pumps are located in a heated structure immediately adjacent to the lakeshore.

1.9 At the rate of intended water usage for operations, explain water balance inputs and outputs in terms of estimated maximum draw down and recharge capability of the river or lake from which fresh water will be drawn.

The current withdrawal rate is 150m^3/day and discharge is approximately 35,000-45,000m^3/day to the lake. The 2012 Hydrology and Lake Elevation report is located on the SLEMA website.

1.10 Will any work be done that penetrates regions of permafrost?

Yes.

1.11 If "Yes" above, is the permafrost continuous or discontinuous?

The Snap Lake Mine site is located in a zone of discontinuous permafrost, with areas beneath SnapLake which are unfrozen. .

1.12 Were (or will) any old workings or waterbodies (be) dewatered in order to bring the present property into production?

N/A as the property is already in production. Dewatering is not authorized under current licence.

1.13 If "Yes", above, indicate the name of the waterbody, the total volume of water to be discharged and the chemical characteristics of that water.

N/A

1.14 Was (or will) the above discharge (be) treated chemically?

N/A

If "Yes" above, describe the applied treatment.

N/A

SECTION 2 -- GEOLOGY AND MINERALOGY

2.1 Physiography: Provide an analysis and interpretation of the geologic and hydrologic environment in the immediate vicinity of the mine or plant. The investigation should extend from ground surface downward to the base of the glacial drift. Include large scale topographic map(s) covering the area where the mine, mill and waste disposal basin are (or are to be) located. The map(s) should provide information on groundwater patterns and permafrost variations in the area.

The topography of the site can be described as gently sloping with occasional bedrock knolls. The site is generally barren of vegetation, except for some isolated areas of low trees located in topographic depressions and along the shoreline. Dwarf shrubs are also found in isolated patches. In addition, some areas of peat and organic soils occur on the northern portion of the peninsula. Surface drainage in the area does not follow any defined pattern; there are no major watercourses such as rivers or creeks occurring within the site area.

Three bedrock units occur near the Mine: kimberlite, granite, and metavolcanic rock.

Diamond-bearing kimberlite ore occurs as a dyke that averages 2 to 3 metres (m) in true thickness. The dyke subcrops on the northwest peninsula of Snap Lake and dips shallowly below the lake, to the northeast. Metavolcanic rock hosts the kimberlite dyke near the northwest peninsula. Granitic (intrusive) rock hosts the kimberlite dyke at distances greater than 300 m from the northwest peninsula.

Intrusive rocks at the Mine are characterized as a multiphase granitoid (MG). Dominant granitoid phases include biotite+/-hornblende granodiorite, granodiorite, granite, and tonalite. Muscovite-bearing pegmatite dykes and granitic dykes commonly transect granitoid rocks. Granite rock will be the dominant development and dilution rock after four years of operation. In the northwest peninsula, granitic rock often occurs as layers and intrusions within metavolcanic units. Finely veined, disseminated and massive sulphides occur at the contact between granitic and metavolcanic units. Therefore, granite in contact with metavolcanic is regarded as a sub-unit of granite.

Metavolcanic rocks consist of well-foliated, high-grade amphibolites, a metamorphic rock comprised of amphibole. Metavolcanic rocks host localized concentrations of sulphide minerals, including pyrite and pyrrhotite, with rare chalcopyrite, in layer parallel zones.

Snap Lake, at a nominal elevation of 433 m, is the headwater lake for the Snap Lake drainage basin. North Lake, several kilometres to the north of Snap Lake, has a surface elevation of approximately 422 m and South Lake, less than one kilometre to the southeast has a surface elevation of 428 m. Based on these elevation differences, it is reasonable to conclude that under pre-mining conditions, Snap Lake recharged the groundwater system and contributed to the discharge to both North Lake and

South Lake. However, the ore and waste developments under the lake have created a disc shaped hydraulic sink, centered on the mine excavations, that draws groundwater from both below and above the kimberlite dyke into the mine.

The hydrologic system at Snap Lake has three general sources of inflow to the mine:

- Seepage from Snap Lake through the lake sediments and the fractured rock crown pillar with a possible contribution from Snap Lake through fractures underneath and sub-parallel to the dyke
- Water from adjacent lakes that is drawn into the rock mass above the dyke by the hydraulic sink that is created by the mine excavations
- Water from the deep groundwater system below the dyke that is drawn into the mine workings by the hydraulic gradient that is created by the mine openings.

An integrated physical hydrogeology, hydro-geochemical and 3D numerical modelling program has been developed for the Snap Lake mine in support of the amendment of the Type A Water License and the ongoing mining activities.

2.2 Briefly describe the physical nature of the orebody, including known dimensions and approximate shape.

The Snap Lake dyke has an average thickness 2 and 3 m and a delineated aerial extent of 11km^2. The dyke dips gently to the east-northeast under Snap Lake. The dip of the dyke is between 11^o and 15^o. On a regional scale, the Snap Lake dyke appears to be a simple continuous, gently dipping sheet, although areas of offset have been identified. On the local scale, the dyke is controlled by local host rock features affected by foliation and joint sets causing splits of the main dyke creating branches and splays or separate lenses.

2.3 Briefly describe the country rock in the general vicinity of the orebody (from the surface to the orebody).

The Snap Lake kimberlite dyke is emplaced into the Archean Slave Province craton and is exposed on the Northwest Peninsula of Snap Lake. The majority of the Snap Lake kimberlite is hosted within an Archean multiphase suite of intrusive granitoids, with a minor portion emplaced within overlying greenstone belt metavolcanics and metasediments.

2.4 Provide a geological description of the ore minerals of the deposit. (If possible include the percentage of metals.)

The Kimberlite ore is an intrusive igneous rock formed from deep seated partial melts of the mantle. The ore exhibits a macrocrystic texture with fine grained groundmass made up of Olivine phenocrysts, Monticellite, Serpentine, Phlogopite, Carbonate, Spinel, Rutile and accessory Apatite surrounding mantle xenocrysts of Olivine, Garnet, Ilmentite and Diamond.

2.5 Describe the geochemical tests which have been (or will be) performed on tailings solids and different geological units of ore, country rock and waste rock to determine their relative acid generation and contaminant leaching potential. Outline methods used (or to be used) and provide test results in an attached report (i.e., static, kinetic tests).

The main geochemical evaluation took place as part of the environmental assessment Report (EAR) between June 1999 and October 2001. The objective of the EAR geochemistry program was to evaluate the ARD potential of rock on site, and to evaluate potential metal leachability under acid generating, neutral, and alkaline conditions. Geochemical characterization took into account the spatial distribution of materials across the Mine site. Detailed results are provided in Appendix III.2 of the EAR.

Annual ARD and Geochemistry Monitoring reports discuss the characterization of rock encountered on site during construction and mining. The annual reports also discuss the results of ongoing water quality monitoring in relation to the results of geochemical characterization of rock at the Mine. Annual reports have been prepared from 2003 to 2012. The 2012 annual Acid/Alkaline Rock Drainage (ARD)

and Geochemistry Monitoring Report is located on the MVLWB website under Water License MV2011L2-004. .

To summarize, waste rocks samples are analyzed for sulphide content. All Non-Acid Generating (NAG) and Potential Acid Generating (PAG) rock samples are sent out to external laboratories for analysis of total sulphides. The results will be used to segregate different types of materials in specific areas. As per the current license the sampling for waste rock characterization includes a minimum of eight (8) samples per every 100,000 tonnes for each rock type. A maximum sulphide content cut-off value of 0.17 wt% sulphide will be used for the evaluation of construction rock. Any rock type with total sulphur of >0.17 % is considered as PAG rock.

2.6 Estimate the percentage of sulphides in the orebody:

Mineral	Percent Sulphides
pyrite	0.09
pyrrhotite	0
pyrite/pyrrhotite mixture	0
arsenopyrite	0.0001

SECTION 3 -- THE MINE

3.1 Indicate the type of mining method to be used on the property.

The principle mining method is mechanized drift and slash with some room and pillar mining in the upper portions of the mine. .

Other mining activity?

Surface Diamond Drilling may continue under the approved mining leases, land use permit and other associated permits to further delineate the ore body over mine life.

3.2 Outline any possible operational changes and when they might occur (i.e., open pit to underground).

N/A.

3.3 Describe the type(s) of explosives to be used in mining operations.

Ammonium Nitrate (AN), Sodium Nitrate (SN) and Ammonium Nitrate Fuel Oil (ANFO) and oil/wax mix (emulsion); detonation by electric and non-electric system.

3.4 Indicate the number of shafts or other openings that are presently on the property. Signify whether or not the openings are presently in use: (submit measurements in metres)

There are five mine openings that break through to surface from the mine. The primary mine access is via the main ramp from surface and the secondary access is the conveyor decline from surface to the crusher. There are three air raises – two for fresh air and one for return air. The emergency egress is via the fresh air raise #2, the lowest of the two Fresh Air Raises, located 5 m vertically above the surface elevation of Snap Lake.

3.5 Are any entrances to shafts, adits, etc. below groundwater level?

No.

3.6 Are permafrost conditions expected?

Yes. Permafrost was encountered for approximately 400 m of the South Ramp developed during the advanced exploration program and can be anticipated in the mine workings north of Snap Lake. Most of the current underground workings are below Snap Lake and are not anticipated to be in permafrost. However, as mining advances down dip to the north, most of the underground openings will be away from Snap Lake and the permafrost zone will be well above the excavations.

3.7 Indicate the expected life of the mine.

Mine is forecasted to close in 2028.

3.8 Indicate the present average rate of production from all ore sources on the property.

3,000 tonnes ore/day and will increase gradually over the life of the mine to a current planned maximum of 3,300 tpd.

3.9 Indicate the expected maximum rate of production from all ore sources on the property.
3,300 tonnes ore/day

3.10 Outline all water usage in the mine, indicating the source and volume of water for each use.
Source Use Volume (m^3/day)
Potable water 120 m^3/day withdrawn from Snap Lake to a maximum withdrawal volume under MV2011L2-0004 of 188,000 m^3/day
Mill water 1000 m^3/day taken from the Water Treatment Plant

3.11 Indicate the volume of natural groundwater presently gaining access to the mine workings.
40,396 m^3/day as discussed in the Underground Water Modeling report and based on values metered and reported on in the monthly SNP.

3.12 Outline methods used (planned) underground to decrease minewater flow. (i.e., recycling)
All water used in the milling process is from recycled underground water. Some underground mine water is also used for drilling.

3.13 Indicate the average daily volume of water to be discharged from the mine during normal operations.

The daily average will be approximately (42,000 m^3/day and will increase over the LOM until it reaches a peak flow of approximately 70-90,000 m^3/day based on current modeling.

3.14 If a mill will be operating on the property in conjunction with mining, will all minewater (underground, open pit, etc.) be directed to the mill for reuse?

No, the volume of mine water is greater than what is needed in the mill; excess water will be discharged to Snap Lake after treatment.

3.15 If not, indicate the proposed point and volume of discharge for the minewater.
Point of discharge: Water Treatment Plant then to Snap Lake
Volume of discharge: 42,000 m^3/day

3.16 What are the chemical and physical characteristics of the preceding minewater?
Please see the mine water quality and modeling reports.

3.17 Are there any treatment plans for minewater and will any chemicals be used in such treatment? Explain.

The permanent water treatment plant (WTP) was commissioned in 2006. The WTP is capable of treating 35,000 m^3/day. A second permanent WTP and outfall is to be commissioned in 2013 to increase capacity to 60,000 m3/day. Future capacity expansions would be carried out if and when required. The water management plan details the water treatment process.

WTP Process:

- Flows from the mine, the treated sewage treatment effluent and water management pond are pumped into the reactor tank.
- The reagents, ferric sulphate and flocculent are added and mixed to the inflows in the reactor tank.
- Water from the reactor tank moves to the clarifier. This unit has a large surface area to allow solids to settle.
- Overflow from the clarifier is pumped to the filter feed tank. This tank is used to regulate inflows to the filtration units.
- The filtration units consist of twelve total units in two banks using a sand medium to further filter the solids in the water. The filters are regularly cleaned by backwashing with treated water. Backwash water containing suspended solids is pumped to the Process Plant or the dirty water tank.
- Water from the filtration units is pumped to the pH tank, where final pH is controlled using sulphuric acid.
- Finally, treated water is discharged to Snap Lake via the diffuser(s). This diffusers direct the discharge through multiple ports and increases mixing of effluent with Snap Lake water.

SECTION 4 -- THE MILL

4.1 Attach a copy of the (proposed) mill flow sheet. Indicate the points of addition of all the various reagents (chemicals) that are (or will be) used.
Please see the 2012 Water License (MV2011L2-0004) annual report for mill information. In addition the mill process was discussed in the project EA (MVEIRB 2003).

Chemicals used:

Ferrosilicon used in the DMS.

4.2 If milling is in progress on the property at the present time, indicate the rate of milling.

Current rate of process is approximately 3,000 tonnes/day and will increase over the life of mine (LOM) to the designed 3,300 tonnes/day.

4.3 What is the present (or proposed) maximum capacity of the mill?

3,300 tonnes/day

4.4 List the types and quantities of all reagents used in the mill process (in kg/tonne ore milled).
Reagent Kg/Tonne Ore Milled

Ferosilicon: 0.280 kg/tonne ore milled
Flocculant/: 0.019 kg/tonne ore milled

4.5 Is the (proposed) milling circuit based on autogenous grinding?

No. The circuit is a scrubbing action, not milling

4.6 Indicate the amount(s) of concentrate(s) produced in the mill.

The concentrate is less than 1% of headfeed this equates to approximately 650 grammes/day of diamonds.

4.7 Will fresh water undergo treatment prior to use in the mill process? Explain.

No fresh water is used in the mill. All water used in the mill is recycled from the water treatment plant. Clarified water is recycled within the mill from the thickener circuits

4.8 Indicate all uses of water in the mill. Include the quantity and source of the water for each use.

As per 4.7 above; 25,000 to 30,000 m^3/month from water treatment plant.

Use	Source	Volume (m^3/day)
I	All DMS areas	A ratio of 7:1 of water to ore used in the DMS circuits
ii.	Scrubbing	A ratio of 1:1 of water to ore is used in the scrubber
iii.	Screen spray water	30-40 m^3/hr per screen (5 screens)

4.9 Indicate the total volume of water discharged from the mill.

25,000 to 30,000 m^3/month water discharged to North Pile as slurry.

4.10 Of the preceding volume, what quantity is (will be) recycled to other areas on the property (mine, mill, etc)? Indicate location of use and quantity.

Location
The water discharged onto the North Pile is recycled via water management network to the water management pond and ultimately the water treatment plant.

4.11 Based on yearly production, indicate the average quantity of tailings (dry weight) discharged from the mill.

As per 4.2 above

4.12 What is the average liquid solid ratio of tailings leaving the mill?

Approximately 1.2:1

4.13 If applicable, identify any chemical treatment applied to the liquid phase before being discharged to the tailings area. (Attach flow sheet if available.)

N/A

4.14 Based on present production or bench test results, describe the chemical and physical characteristics of liquid mill wastes directed to the tailings area.

Cu 0.0044 mg/L
Ammonia 26 mg/L

Suspended solids 54 mg/L
Zn 0.012 mg/L
Ag 0.0004 mg/L
Mn 0.27 mg/L
Alkalinity 62 $CaCO_3$/L
Ni 0.048 mg/L
Fe 0.032 mg/L -> 0.000032 g/L
Hg 0.00001 mg/L
As 0.001 mg/L
Cd 0.0002 mg/L
Cr 0.001 mg/L
Al 0.022 mg/L
Specific conductivity Range: 2.3 – 5850 uS/cm, average: 2015 uS/cm
pH Range: 5.5 – 9, average = 7.1
Hardness Range: 45 – 2250 mg/L, average: 621 mg/L
Total Cyanide mg/L Not measured as not of concern
Oil and Grease mg/L Not measured as not of concern

4.15 Provide a geochemical description of the solid fraction of the tailings.
This information is detailed in the Water License Annual Report (WLAR) required under Water License MV2011L2-0004 submitted annually.

4.16 Identify the current source of power production.

Power is produced by diesel generator sets. The Mine has primary and auxiliary generating plants, with a combined nameplate capacity of 20.85 MW, soon to be approximately 25 mW. The primary plant consists of four Caterpillar 3616 gensets (4.125 MW each), with a 5th genset currently being added. and the auxiliary plant consists of three Caterpillar 3516 gensets (1.45 MW each).

4.17 Other properties (or will the mill be handling any in the future)?

Discharge from the process is planned to be by thickened paste with approximately 50% discharged underground and 50% onto the North cell. De Beers will provide updates to ongoing paste deposition feasibility research in the 2013 Water License Annual Report to be submitted on March 31, 2014.

4.18 If so, specify ore characteristics and describe any mill processes which will change as a result.

Nil, High density thickened paste at approximately 70% solids

4.19 If tailings are being recovered in the mill or elsewhere for use as backfill (etc.) in the mine (etc.), indicate the quantity of solid tails (tonnes/day) recovered from the mill process.

Approximately 50% of the tailings will be recovered over the life of mine to use as fill underground. Please see comments in section 4.17 above on timing and future revisions.

4.20 Will exits be bermed to prevent spills from escaping the mill?

All exits have doors that close to prevent spills. Various sumps and sump pumps in the mill area are used to collect any spillage or hosed material.

4.21 Will all sumps for process tanks have the required 110% holding capacity of the largest tank?

No, all process tanks are contained in the process plant, which is an enclosed building.

SECTION 5 -- THE TAILINGS AREA

5.1 Is the tailings containment area (being) designed for total containment?

Yes. Facilities for containment of processed kimberlite and mine rock solids are designed for total containment. Any seepage from the facilities will be collected and treated in the Mine Water Clarification Pond prior to discharge.

5.2 Attach detailed scale plan drawings of the proposed (or present) tailings area. The drawings must include the following:

(a) details of pond size and elevation;
(b) precise details of all retaining structures (length, width, height, materials of construction, etc.);
(c) details of the drainage basin, and existing and proposed drainage modifications;
(d) details of all decant, siphon mechanisms etc, including water treatment plant facilities;
(e) the plan for tailings deposition and final tailings configuration;
(f) details with regard to the direction and route followed by the flow of wastes and/or waste waters from the area; and
(g) indications of the distance to nearby major watercourses.

The following maps have been included in the application:

- Surveillance Network Program Stations
- Map of water conveyance system from the 2013 Water Management Plan
- Maps of downstream and reference lakes and watershed

5.3 Explain your choice of location for the tailings pond design by rationalizing rejection of other options. Consider the following criteria in your comparisons: subsurface strata permeability, abandonment of tailings, recycling/reclaiming waters, and assessment of runoff into basins. Attach a brief summation.

De Beers considered four alternatives for the location of the processed kimberlite during the project design (De Beers 2002). Processed kimberlite could be contained in (1) a local lake or (2) underground or (3) in piles on the surface of the north peninsula or (4) in piles south of the north peninsula. No water body of adequate size or suitability was located near the project area; consequently, use of a lake as a containment area was rejected for environmental and engineering reasons. The use of an existing water body or depression would have greatly expanded the mine footprint. Underground and surface storage (in the North Pile) were thus the preferred locations for processed kimberlite storage.

5.4 The total area for the existing tailings basin is _____46.35 hectares____ split between three phases, the starter, east and west cells.

Starter cell overall footprint = 24.12 Ha
East cell overall footprint = 22.23 Ha
West cell overall footprint = 33.93 Ha

5.5 The average depth of the tailings basin is ___35__ metres.

5.6 Indicate the total capacity for the existing tailings area by using water balance and stage volume calculations and curves. (Attach a description of inputs and outputs along with volume calculations).

During the project environmental assessment (De Beers 2002, MVEIRB 2003) it stated that

approximately 12.1 million tonnes of solids will be placed within the North Pile during mine life and 6.6 million m^3 of porewater. Tailings designs are presently under review and revised information will be provided as noted in 4.17 in March 2014.

5.7 Indicate the total capacity for any proposed tailings area by using water balance and stage volume calculations and curves. (Attach a description of inputs and outputs along with volume calculations).

See 5.6 above.

5.8 Will the present tailings area contain the entire production from the mine mill complex for the life of the project?

Yes, the approved design for the containment facility will contain the entire production from the mill. However the facility was approved to be built in 3 stages – Starter Cell, East Cell and West Cell. Construction of the East Cell began in 2010 and is scheduled for completion in 2016. The West Cell will be built at a future date.

5.9 If "No" above, or if production output increases tailings volumes, indicate what plans have been made for future tailings disposal on the property.

N/A

5.10 Has any land in the immediate area been identified as native or crown land or withdrawn pending Native Claim Settlement?

De Beers has four land leases with the Crown for the mine.

5.11 Do the tailings area and all related treatment facilities lie on company held claims?

Yes.

5.12 If not, indicate mine claim boundaries (and owners) on tailings area plan map (see Q.58). Also, attach a copy of all pertinent agreements signed with the owners of the claims not held by the Company.

N/A

5.13 Will the proposed tailings area engulf or otherwise disturb any existing watercourse?

No.

5.14 If "Yes", attach all pertinent details (name of watercourse, present average flow, direction of flow, proposed diversions, etc.).
N/A.

5.15 If any natural watercourse will gain access to the proposed tailings area, what methods will be used to decrease the amount of runoff water entering the containment area? Indicate the volume of water which will enter the tailings area from the source(s) in question and attach all pertinent details of proposed diversions.

No watercourse will enter the facility.

5.16 Indicate on the tailings area plan drawing (see Q.61) all sources of seepage presently encountered in the vicinity of the tailings area, the volume of each seepage flow (m^3/day), and

the direction of each flow.

The design of the tailings area is so that water seeps out of containment facility to water control structures to be routed to the WTP for treatment.

5.17 Are the seepage flows from the property presently being treated chemically? If so, describe how.

Yes, seepage is controlled and pumped to the water treatment plant and treated with the minewater as per 6.1.

5.18 If not, explain.

N/A

5.19 Please attach a conceptual Abandonment and Restoration Plan for all tailings areas being developed. Describe the measures that have been (or will be) taken to contain and stabilize the tailings area(s) against leaching and seepage after operations on the property cease.
This is detailed in the ICRP on the Board website.

5.20 Describe the proposed or present operation, maintenance and monitoring of the tailings area.
This is detailed in the geotechnical and geochemical monitoring plan (De Beers 2013) on the Board website under Water License MV2011L-004).

SECTION 6 -- WATER TREATMENT

6.1 Describe the methods of chemical treatment that are presently being used and/or will be used to control the quality of the tailings effluent. Attach engineering drawings where applicable and a process flow chart. If a pilot test has been conducted please attach description of methodology and results.

The water treatment process is explained above in Question 3.17.
Design details for the Water Treatment process including maps are included in the Water Management Plan on eth Board Website submitted by De Beers on October 1, 2013.

6.2 List the names of chemicals to be used in the water treatment process.

Ferrosilicon, Flocculent and Sulphuric acid.

6.3 What is the proposed or present average rate of effluent treatment of the plant (if applicable)?
42,000 m^3/day

6.4 What is the proposed or present maximum effluent treatment capacity of the plant (if applicable)?
70,000-90,000m^3/day

6.5 Will treated effluent be discharged directly to a natural waterbody or will polishing or settling ponds be employed? Describe location, control structures and process of water retention and transfer. Attach any relevant design drawings.

Please see 3.17 for the description of the water treatment process and appendices

6.6 Name the first major watercourse the discharge flow enters after it leaves the area of company operations.

Snap Lake

6.7 In terms of rate of effluent release, and volume and flushing rate of the receiving watercourse, estimate the extent of the mixing zone within the receiving waters and where background levels of constituents for that watercourse will be attained.

The current approved mixing zone at Snap Lake is 200 m from the point of discharge. An environmental assessment was conducted that scoped impacts of effluent discharge on Snap Lake.

6.8 Describe the present (proposed from pilot tests) chemical and physical characteristics of the tailings effluent (decant).

No tailings effluents decant. The seepage water from the North Pile is discussed in the site water model report.

SECTION 7 -- ENVIRONMENTAL MONITORING PROGRAM

7.1 Has any baseline data been collected for the main waterbodies in the area prior to development?

Yes, please see the Environmental Assessment for the Project (De Beers 2002, MVEIRB 2003) and the AEMP Annual Report.

7.2 If "Yes", include all data gathered on the physical, biotic and chemical characteristics at each sampling location. Identify sampling locations on a map.

All data is summarized in the AEMP annual report posted to the Board Website as well as in the Surveillance Network program monthly reports required under Water License MV2011L2-0004.

7.3 Provide an inventory of hazardous materials on the property and storage locations. (attach separate map)

Hazardous materials locations and storage methods are detailed in the Waste Management Plan due to the Board on January 31st, 2014 and in the Emergency Response and Spill contingency Plans.

7.4 Attach the present or proposed contingency plan which describes course of action, mitigative measures and equipment available for use in the event of system failures and spills of hazardous materials.

As per 7.3 this is detailed in the Spill contingency plan on the Board Website as required under Water License MV2011L2-0004.

7.5 Provide a brief overview of the conceptual abandonment and restoration plan for the site.

The Interim Closure and Reclamation Plan (ICRP) currently under review for the Mine is located on the Board Website under Water License MV2011L2-0004.

SECTION 8 -- PRESCREENING

In addition to providing sufficient technical and related information for licensing to proceed, applicants must provide adequate descriptive information to ensure that an initial pre-screening decision can be made prior to a project proceeding for regulatory approvals.

Your application and other project details, such as this questionnaire, will be sent out for review by local aboriginal, as well as, territorial and federal government agencies. Their comments (e.g., regarding the significance of project impacts) are considered before a decision is made to allow the project to proceed.

8.1 Has this project ever undergone an initial environmental review, including previous owners?

Yes. The Mackenzie Valley Environment Impact Review Board performed an Environment Assessment under the Mackenzie Valley Resource Management Act from 2001 to 2003. The Report of Environmental Assessment and Reasons for Decision on the De Beers Canada Mining Inc. Snap Lake Diamond Project was received on July 24, 2003.The Ministers approval and decision letter was received October 10, 2003. The project was exempt from preliminary screening during the 2011 Water License renewal process.

8.2 Has any baseline data collection and evaluation been undertaken with respect to the various biophysical components of the environment potentially affected by the project (e.g., wildlife, soils, air quality), in addition to water related information requested in this questionnaire?

Yes, please see the Developers assessment report as well as the Environmental Agreement Annual Reports on Wildlife, Vegetation and Air Quality on the SLEMA website.

8.3 Has any meteorological data been collected at or near the site? (e.g., precipitation, evaporation, snow, wind)

Yes, please see the Environmental Agreement and Hydrology Annual Reports on the SLEMA website as per 8.2.

8.4 If "Yes", please include data and attach copies of reports or cite titles, authors and dates.

Please see comments for 8.3

8.5 If "No", are such studies being planned? Briefly describe the proposals.

N/A

8.6 Has authorization been obtained or sought from the Department of Fisheries and Oceans for dewatering or using any waterbodies for containment of waste?

N/A

8.7 Please attach an outline briefly describing any options or alternatives considered or rejected for the various mine components outlined in this questionnaire (e.g., mill site, water supply sources, locations for ore and waste piles).

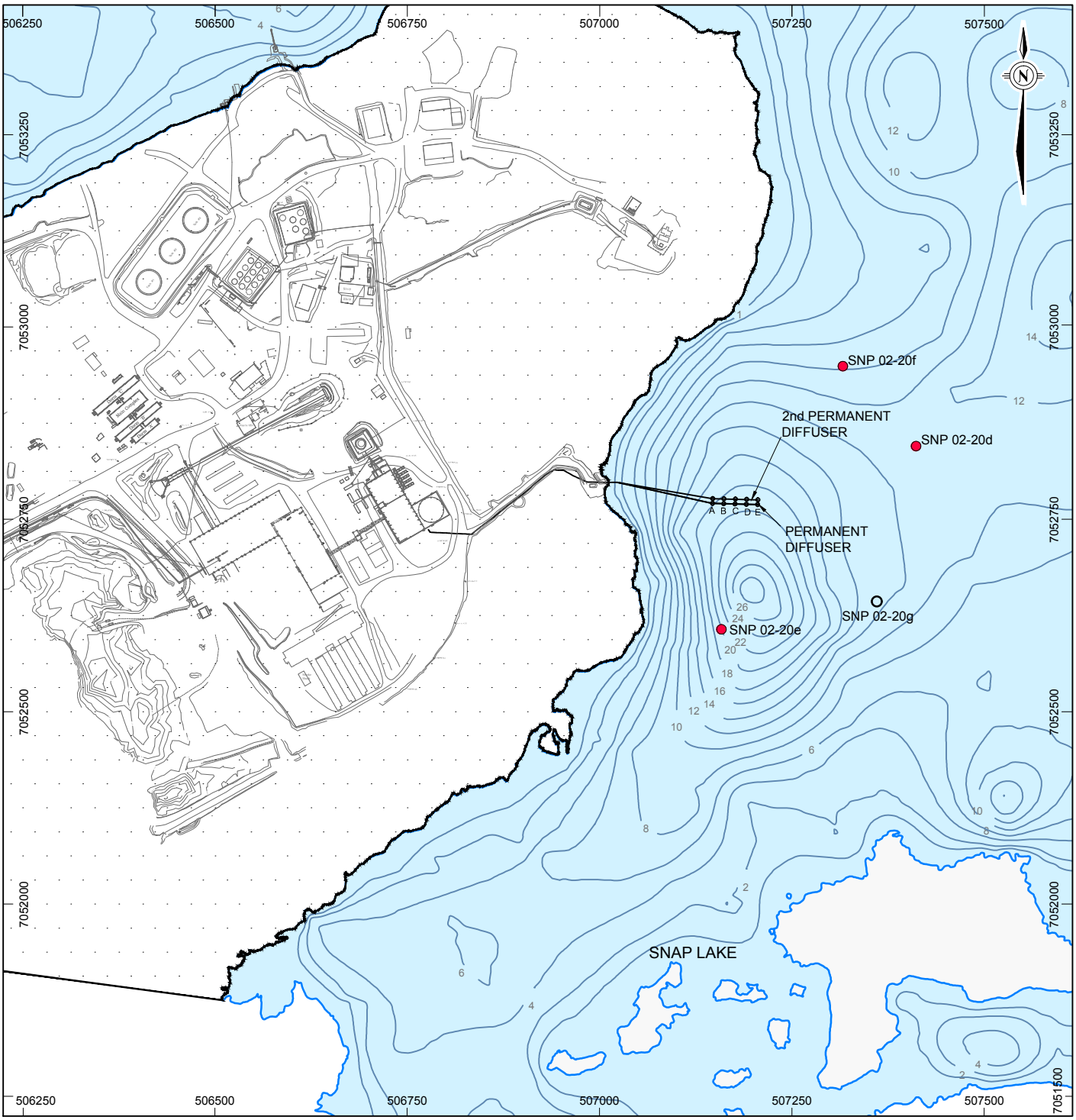
N/A. Not a new project or development. This application covers proposed amendments to conditions in an existing water licence.

8.8 Has a socio-economic impact assessment or evaluation of this project been undertaken? (This would include a review of any public concerns, land, water and cultural uses of the area, implications of land claims, compensation, local employment opportunities, etc.)

Yes. The Mackenzie Valley Environment Impact Review Board performed an Environment Assessment under the Mackenzie Valley Resource Management Act from 2001 and 2003.

8.9 If "Yes", please describe the proposal briefly.

Please see the Snap Lake Mine EA on the MVEIRB website and subsequent Report of EA.



LEGEND

- SNP Station Location
- New Monitoring Station
- Bathymetric Contour (2 m interval)
- Mine Infrastructure
- Permanent Diffuser Location
- Snap Lake Mine Footprint
- Waterbody

REFERENCES

Digital map from Mackay Lake, Northwest Territories, produced by Department of Energy, Mines and Resources. map 75M, original scale 1:250,000, NAD 83 UTM Zone 12.
Snap Lake outline and islands were corrected to LANDSAT 7 satellite image 45/15, dated September 2, 2000. provided by geobase.
Bathymetry was created in surfer 8 using sonar data from the 2002 north lakes program (Golder) and 2005 transect data from the reference lake search program (golder) and 2011 data from the spill response program (golder).
Snap Lake Plantsite drawing obtained from client. DATE: JUNE 12, 2012. "SNAPLAKE-08_STATMAP_2012". drawn by NampcySolutionsLtd.
Outfall pipe and diffuser as-built survey by Golder Construction, September 2011.

NOTES

1. Map moved to NAD83 coordinate system.
2. Monitoring at SNP 02-20g will begin once the 2nd diffuser is operational

SNAP LAKE MINE

Monitoring Stations in Snap Lake Near the Diffuser

PROJECTION: UTM Zone 12	DATUM: NAD83	DE BEERS GROUP OF COMPANIES
150 0 150 SCALE 1:7,500 METRES		
FILE No: 13134900011150-01		DATE: December 11, 2013
JOB No: 13-1349-0001	REVISION No: A	Figure **1**
OFFICE: GOLDER VICTORIA	DRAWN: JEF / CHECK: LY	

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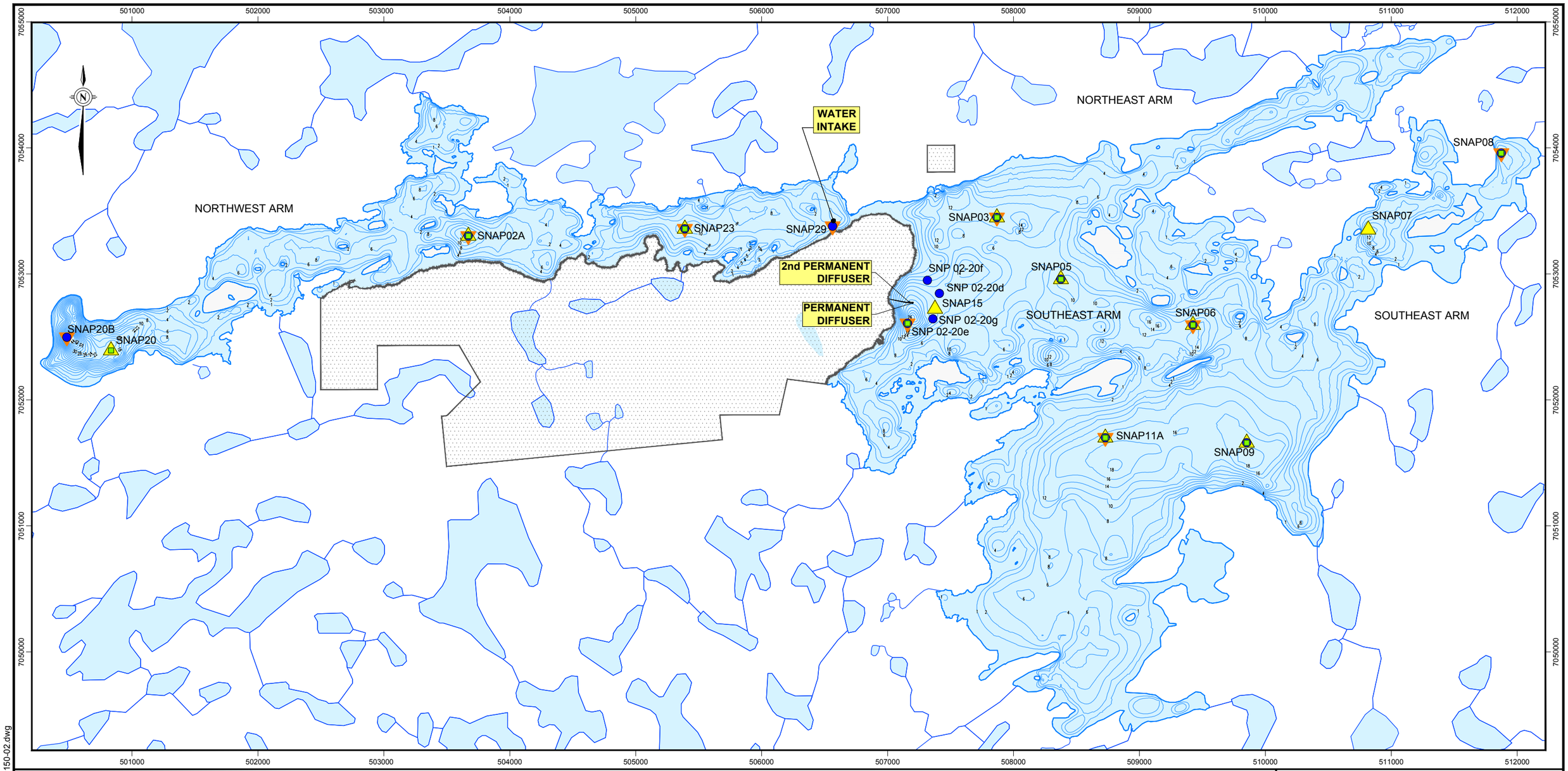

LEGEND

- Depth Contour (m)
- Watercourse
- Waterbody
- Snap Lake Mine Footprint
- Water Quality Monitoring Station
- Sediment Quality Monitoring Station
- Benthic Invertebrate Monitoring Station
- Plankton Monitoring Station

REFERENCES

Digital Map from Mackay lake, Northwest Territories, produced by Department of Energy, Mines and Resources. Map 75M, Original scale 1:250,000, projection : Transverse Mercator, Datum : NAD83, coordinate system : UTM zone 12.

Snap Lake outline and islands were corrected to LANDSAT 7 satellite image 45/15, dated September 2, 2000. provided by Geobase.

Bathymetry was created in Surfer 8 using sonar data from the 2002 North Lakes program (Golder) and 2005 transect data from the Reference Lake Search program (Golder).

NOTES

Map moved to projection : Transverse Mercator, Datum : NAD83, Coordinate system : UTM zone 12.

SNAP LAKE MINE

Monitoring Stations in Snap Lake 2013 to 2016 AEMP

PROJECTION: UTM Zone 12	DATUM: NAD83	DE BEERS GROUP OF COMPANIES
500 0 500 SCALE 1:30,000 METRES		
FILE No: 13134900011150-02		DATE: December 11, 2013
JOB No: 13-1349-0001	REVISION No: A	
OFFICE: GOLDER VICTORIA	DRAWN: JEF / CHECK: LY	Figure **2**

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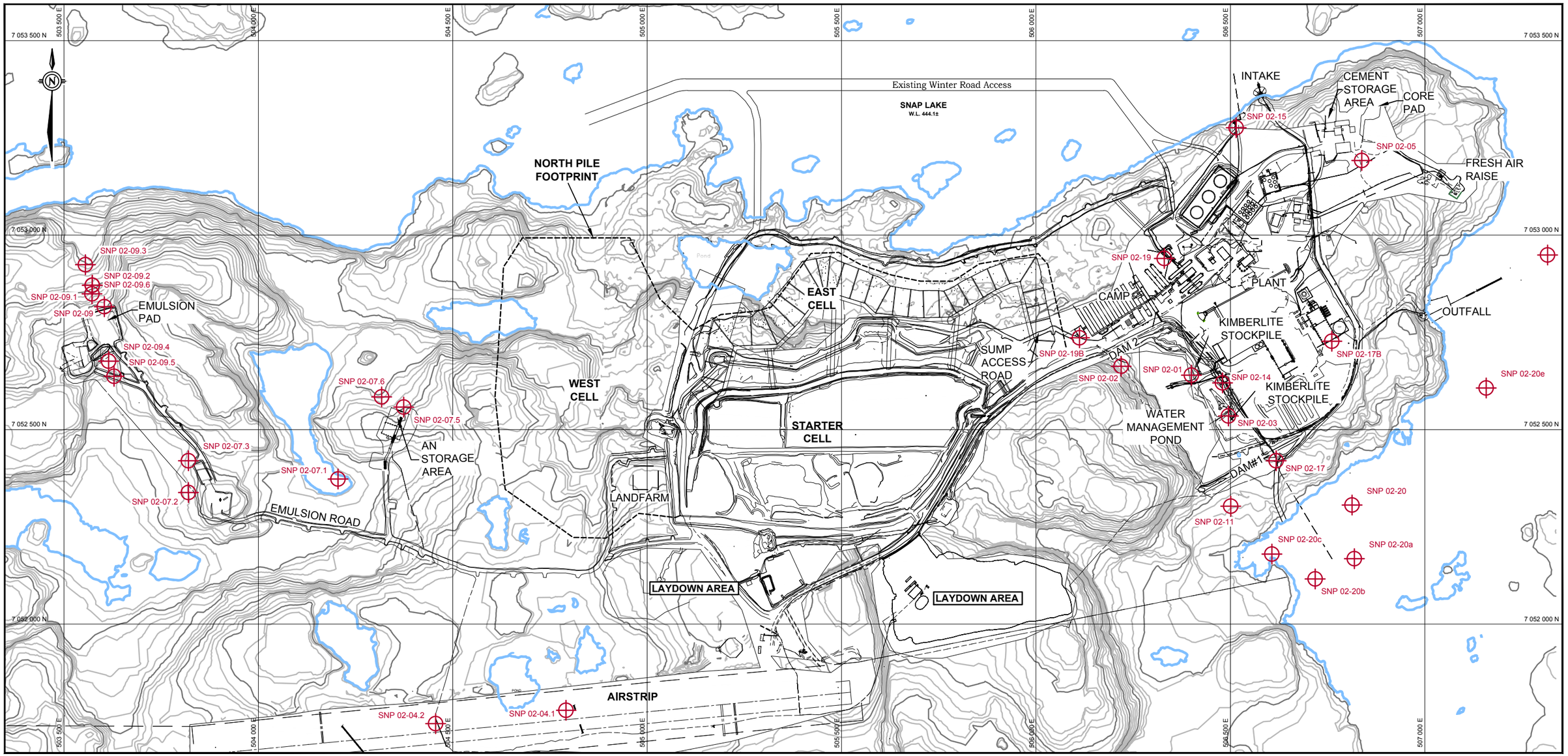

LEGEND

- SNP MONITORING LOCATIONS
- WATERBODY
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 5 m)

REFERENCES

1. ALL DIMENSIONS AN ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED. COORDINATE SYSTEM IS NAD83 UTM ZONE 12.
2. THE GROUND SURFACE AND WATER LEVEL ELEVATIONS ARE CONSIDERED APPROXIMATE.

NOTES

1. BASE MAP INFORMATION PROVIDED BY AMEC AMERICAS LIMITED ON NOVEMBER 12, 2004.
2. GROUND SURVEY INFORMATION PROVIDED BY AMEC AMERICAS LIMITED ON JANUARY 5, 2005 AND ABORIGINAL ENGINEERING LTD. ON DECEMBER 07 & 18, 2006. IN AREAS OF COMMON COVERAGE, THE MOST RECENT DATA IS PRESENTED.
3. PROJECT SITE INFRASTRUCTURE INFORMATION PROVIDED BY DEBEERS CANADA IN FEB. 2010 (Site Map.dwg).

SNAP LAKE MINE

Snap Lake Mine Site Configuration Inluding Water Quality Monitoring Locations

PROJECTION: UTM Zone 12	DATUM: NAD83	DE BEERS GROUP OF COMPANIES
200 0 200 SCALE METRES		
FILE No: 13134900011150-03		DATE: December 11, 2013
JOB No: 13-1349-0001	REVISION No: A	Figure 3
OFFICE: GOLDER VICTORIA	DRAWN: JEF / CHECK: LY	

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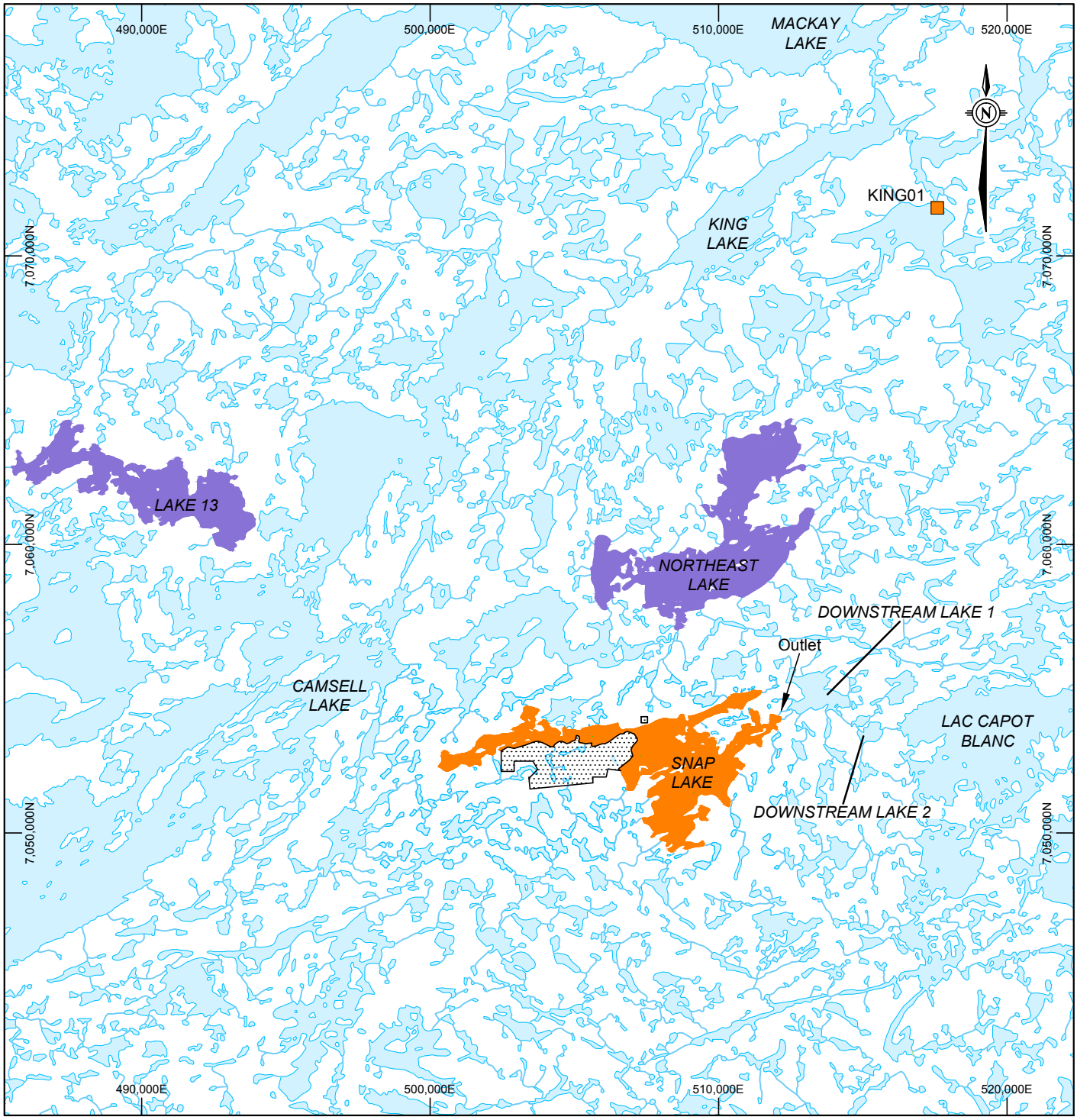

LEGEND

- WATER QUALITY STATION
- MONITORING AREA
- REFERENCE AREA
- SNAP LAKE MINE FOOTPRINT
- WATERBODY

REFERENCE

DIGITAL MAP FROM MACKAY LAKE, NORTHWEST TERRITORIES,
PRODUCED BY DEPARTMENT OF ENERGY, MINES AND RESOURCES.
MAP 75M, ORIGINAL SCALE 1:250,000, PROJECTION : TRANSVERSE MERCATOR,
DATUM : NAD83, COORDINATE SYSTEM : UTM ZONE 12.

SNAP LAKE MINE

STUDY AREA, 2012 AEMP

PROJECTION: UTM Zone 12	DATUM: NAD83	
4 0 4 SCALE KILOMETRES		DE BEERS GROUP OF COMPANIES
FILE No: 13134900011150-04		DATE: 2013-12-11
JOB No: 13-1349-0001	REVISION No: A	Figure **4**
OFFICE: GOLDER VICTORIA	DRAWN: JEF / CHECK: ----	

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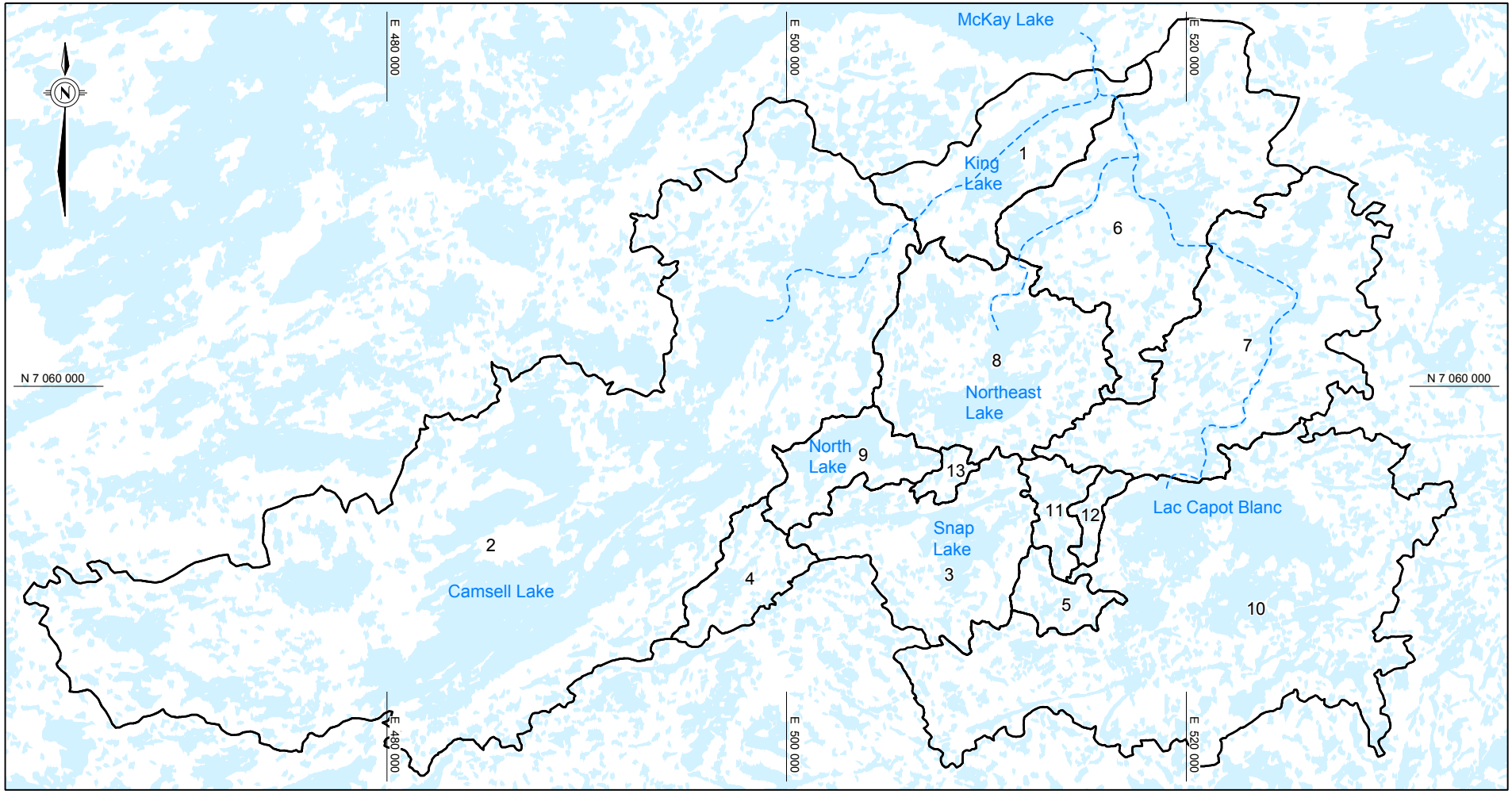

LEGEND

Sub Basin Boundary

NOTES

Grid is displayed in NAD 83 UTM Zone 12.

REFERENCE

Digital Map from Mackay lake, Northwest Territories, produced by Department of Energy, Mines and Resources. Map 75M, Original scale 1:250,000, projection : Transverse Mercator, Datum : NAD83, coordinate system : UTM zone 12.

SNAP LAKE MINE

Snap Lake Watersheds Map

PROJECTION: UTM Zone 12	DATUM: NAD83	DE BEERS GROUP OF COMPANIES
5 0 5 SCALE 1:300,000 KM		
FILE No: 13134900011150-05		DATE: December 11, 2013
JOB No: 13-1349-0001	REVISION No: A	Figure **5**
OFFICE: GOLDER VICTORIA	DRAWN: JEF / CHECK: LY	

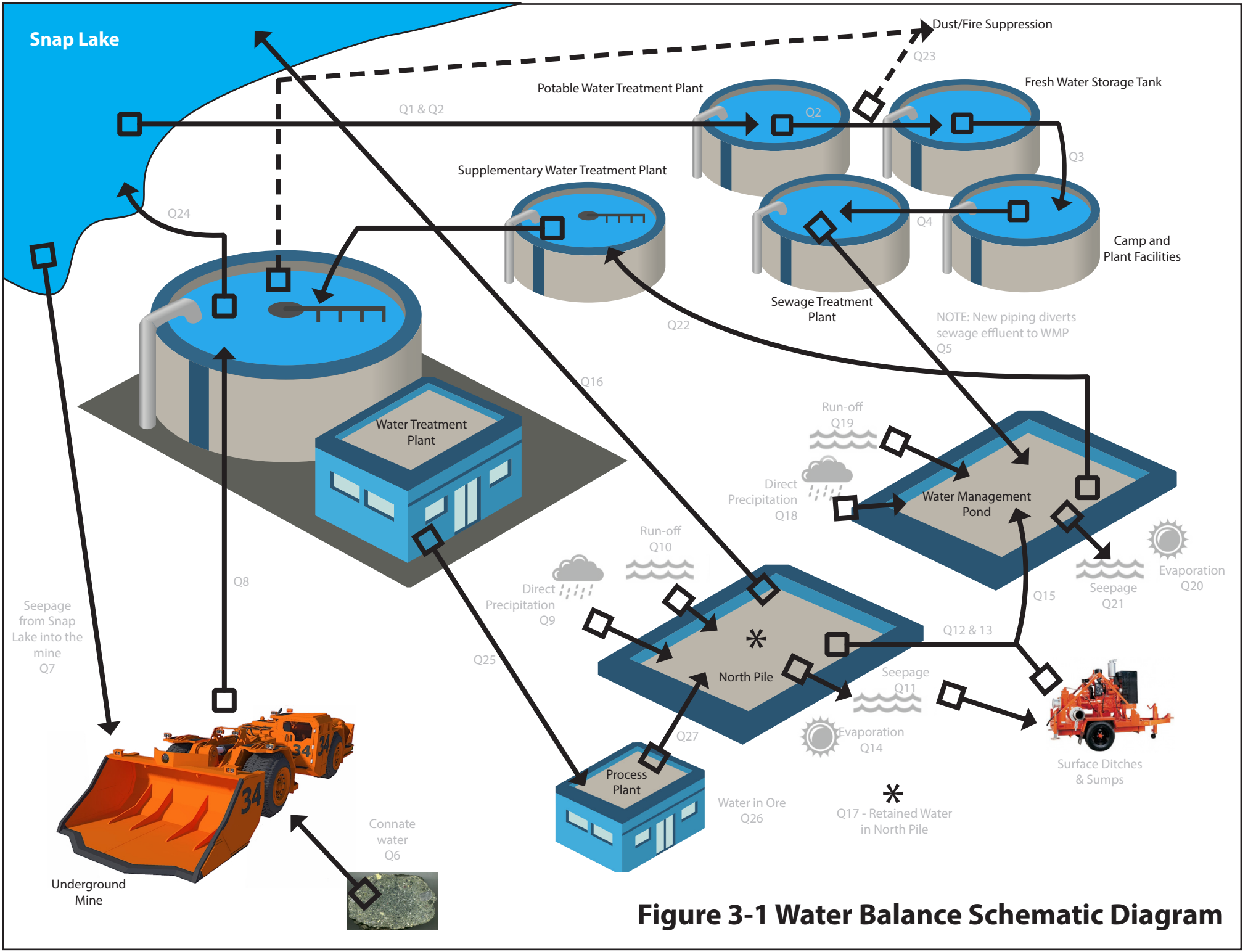

Figure 3-1 Water Balance Schematic Diagram