

From: [Chisholm, Veronica](#)
To: [Todd Slack](#); angela.love@mvlwb.com; Nathen.Richea@aandc-aadnc.gc.ca
Cc: [Faithful.John\(John.Faithful@golder.com\)](mailto:Faithful.John(John.Faithful@golder.com))
Subject: RE: Baseline vs Predicted WQ in N11 and Kirk Lake Watershed
Date: March-26-14 7:41:51 PM

Hi Todd,

If you are asking how much higher 10 to 14 mg N/L is relative to 0.019 mg N/L, the answer is 526 to 750 times higher – simple math. However, that does not really provide anything meaningful with respect to protection of the aquatic receiving environment, which is what we have assessed in establishing the EQCs for ammonia and nitrate.

As explained below, ammonia and nitrate levels will increase in the water management pond. We are requesting in the Licence that we release water from the water management pond with regulated ammonia and nitrate concentrations up to 10 to 14 mg N/L respectively into Lake N11. This will be done as a very controlled release of a small quantity of this water relative to a large receiving environment, in a short period of time. Our assessment, which follows a CCME approach, shows that the mixing zone to bring ammonia and nitrate concentrations to a level that will not have a measureable effect on the aquatic life in the receiving environment is within 200 m of the discharge.

Forgive me but I am going to oversimplify to provide a visual - in my mind it is like a large bucket (maybe a very large bucket) of higher concentration water being poured slowly over a relatively short period of time into a swimming pool that has continual flow; volumetrically, 3.5 Mm³ are being discharged over three months to a basin that holds ~10Mm³, but has water moving through it (open water conditions).

Also worth noting is the EQCs are set to max WMP concentrations in Year 3 of discharge; these concentrations will be lower in Year 1 and 2.

Sorry for the delay in responding and let me know if you have any follow-up or I can wait for the Intervention.

Warm Regards.

Veronica

From: Todd Slack [mailto:tslack@ykdene.com]
Sent: Tuesday, March 18, 2014 9:48 AM
To: Chisholm, Veronica; angela.love@mvlwb.com; Nathen.Richea@aandc-aadnc.gc.ca
Cc: Faithful, John (John_Faithful@golder.com)
Subject: RE: Baseline vs Predicted WQ in N11 and Kirk Lake Watershed

Thanks for the response. However, the original question is still unanswered (See below for original) – this represents a potential increase of 50 and 75 times – Do I have that right?

From: Chisholm, Veronica [<mailto:Veronica.Chisholm@debeersgroup.com>]
Sent: Tuesday, March 18, 2014 8:28 AM
To: Todd Slack; angela.love@mvlwb.com; Nathen.Richea@aandc-aadnc.gc.ca
Cc: Faithful, John (John.Faithful@golder.com)
Subject: RE: Baseline vs Predicted WQ in N11 and Kirk Lake Watershed

Dear Todd,

Thank you for the question. Please see response below.

There is a notable difference between the EQCs for nitrate and ammonia and their respective background concentration for waters in the LSA. As is evidenced from other mining operations, it is anticipated that nitrate and ammonia concentrations in the water management pond (WMP) will increase during operations, even during the initial three years of operations when the mine plan includes operational discharge. The source of the nitrate and ammonia is primarily water contact with mine rock and blasting residuals in the controlled area, which is transferred/diverted to the WMP.

The EQCs for nitrate and ammonia are provided in two forms:

- the average concentrations of nitrate from samples collected from the source of the discharge over a one-month period (i.e., AML) should not exceed 14 milligrams of nitrogen per litre (mg N/L) and the concentration in any sample from the source of the discharge (i.e., DML) should not exceed 27 mg N/L; and
- for total ammonia, an AML and DML of 10 and 21 mg N/L, respectively.

It is important to reiterate that these concentration limits (EQCs) apply at the source of the discharge. Once discharged, nitrate and ammonia will be subsequently mixed and assimilated based on conditions in the receiving environment. The EQCs are set so that concentrations at the edge of the mixing zone, throughout the receiving environment, and further downstream, remain within concentrations that are protective of aquatic life and will support all traditional uses of waters, including drinking the water, and harvesting and consuming the fish. **The EQCs were calculated based on site-specific water quality objectives (SSWQOs), which account for site-specific conditions and consideration of the protection of aquatic fauna, and potential water uses.** This process is in line with guidance of Canadian Council of Ministers of the Environment (CCME 2007).

Please let us know if you have any additional follow-up questions.

Thanks
Veronica

From: Todd Slack [<mailto:tslack@ykdene.com>]
Sent: Tuesday, March 11, 2014 12:04 PM
To: Chisholm, Veronica; angela.love@mvlwb.com; Nathen.Richea@aandc-aadnc.gc.ca
Subject: RE: Baseline vs Predicted WQ in N11 and Kirk Lake Watershed

So if I understand

Ammonia and nitrate EQC is .019 mg/l background. License ask is 10 and 14 mg/L respectively. So the potential increase is something like 50 and 75 fold (I don't have a calculator if im typing on the phone)

I have that right?

Sent from my Windows Phone

From: [Chisholm, Veronica](#)

Sent: 2014-02-12 1:20 PM

To: angela.love@mvlwb.com; [Todd Slack](#); Nathen.Richea@aandc-aadnc.gc.ca

Subject: Baseline vs Predicted WQ in N11 and Kirk Lake Watershed

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