WILDLANDS LEAGUE
A chapter of the Canadian Parks and Wilderness Society

16 December 2013

Northern Region Permit To Take Water Coordinator
Ministry of the Environment
Operations Division
Northern Regional Office
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Re: Wildlands League comments
2013 PTTW extension application: DeBeers/Victor Mine

The applicant is requesting:

Permit to Take Water (PTTW) #8718-7JZGMZ was issued to De Beers Canada Inc. on October 3, 2008 for full-scale, well field mine dewatering. This permit was subsequently replaced by PTTW #5521-8CZSNK issued on January 12, 2011, and expiring September, 2013. This amendment proposes to extend and amend this PTTW.

(a) That the permit expiry date be set to coincide with the end of the Victor Diamond Mine's maximum projected mine life (i.e., to a date of December 31, 2018).

(b) Revisiting PTTW Conditions 3.5.1 and 3.5.2 regarding the provision flow supplementation to the Granny Creek system. The prescribed flow supplementation rates to Granny Creek were based on pre-operational modeling and analysis. Since that time, De Beers notes that Granny Creek almost always exceed the supplementation rate even during periods when flows in the reference watershed were almost zero, when local watersheds would be operating under near baseflow conditions. De Beers is hoping to improve the flexibility of its current Attawapiskat River freshwater distribution system, and in so doing, free-up pumping capacity that can then be used for well field blending, and other uses, should these be required. The most recent solute transport model indicates that the 1,500 mg/L chloride concentration threshold for blending, as per Condition 4(3) of related Certificate of Approval 3960-7Q42G, could potentially be exceeded by a small margin in two to three years from now.

(c) Consideration by the Ministry to add in clause 3.3 one additional incidental usage for the water extracted by the dewatering wells.

(d) Reduced frequency of various Condition 4 monitoring / reporting obligations

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Our comments on this application:

(1) Water-taking and discharge must be considered together

We remain very concerned about this PTTW and its associated discharge (Industrial Sewage Works Certificate of Approval #8700-783LPK). When changes to related permits are considered, it is reasonable to expect a review of the implications on all authorizations. This PTTW is logically linked to the Industrial Sewage Works Approval through condition 2.2.1, and the intrinsic reliance on discharge to the receiving waters in the case of this dewatering Permit is quite clear.

> *Condition 2.2.1: No water taken under the authority of this Permit may be discharged directly to the natural environment except in accordance with an OWRA, Section 53, Industrial Sewage Works Approval.*[1]

As we do not see how a dewatering authorization can be reviewed without considering its discharge, and the potential effects of the entire system, our comments encompass the entire open pit dewatering and discharge to the Attawapiskat River, currently and in the near future.

(2) A thorough review of associated discharge effluent is required

The purpose of the Ontario Water Resources Act is: "to provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being.[2]"

One cannot provide for conservation, protection and management, nor their efficient and sustainable use unless withdrawals are understood in the context of the effects of associated discharges in the dimensions of both quality and quantity in the long-term, relative to a baseline condition.

This project has advanced in the face of a great deal of uncertainty. For better or worse, it is serving as an experiment for this type of mining, in this sensitive ecosystem. That the experience gained in these first years of operation has provided some confidence in operations is only as good as how transparently and credibly that experience has been gained and considered. Some of this experience has included negative feedback demonstrating unexpected consequence, such as the elevated methylmercury, and higher than expected chloride levels in effluent cited below.

Conditions attached to authorizations are a common tool to provide for some of these tests, yet the trigger values relied upon for mercury monitoring represent one example where the conditions are unlikely to meet this need, particularly when considered alongside the comments below regarding the misuse of the CCME mercury guidelines, the uncertainty around the instances of elevated methylmercury, and a pending operational change to a different dewatering regime.

Documents obtained through the Ontario's *Freedom of Information and Protection of Privacy Act* show that the MeHg levels in fish in the vicinity of the Victor project have increased. These increases are characterized as 'statistically significant' in Debeers' 2012 annual report on

[1] *PTTW #5521-8CZSNK issued by MOE on January 12, 2011*

[2] *Statutes of Ontario (2007). Ontario Water Resources Act. c.12, s.1(1).*

Mercury Performance Monitoring, a report required under their certificate of approval. Elevation of MeHg has been detected in the surface waters of South and North Granny creeks, along with "statistically significant" increases in the mercury body burden of Pearl Dace in North Granny Creek.

No root cause analysis has yet been undertaken, to our knowledge, despite obligations agreed to by the proponent with MOE, as outlined in the document "Trigger Values for Mercury Concentrations and/or Body Burdens in Fish, Condition 6(10) of Certificate of Approval #8700-783LPK, De Beers Canada Inc. Victor Mine.

Fish in the area waterbodies, including North and South Granny creeks, are already well above the Canadian tissue residue guidelines of 33 ug/kg for protection of Wildlife Consumers of Aquatic Biota (found on CCME web site at http://ceqg-rcqe.ccme.ca/download/en/294/). Given this already elevated level of MeHg in the fish locally (as seen from the fish testing results of fish from the Attawaspikat river that inform the Guide to Eating Ontario Sportfish and analysis of local fish by Debeers pursuant to conditions of their Certificate of Approval) and the reported increases observed in the waters of North and South Granny Creek and in the Pearl Dace of North Granny Creek related to the Victor mine activities, any increase of MeHg in the surface water cannot be tolerated and could make the fish contamination situation worse.

Noting that MeHg levels in the discharge water is below the PWQO at 0.2 ug/L (or even that it is below the more stringent CWQG for protection of Aquatic Life - methylmercury in freshwater at 4 ng/L) is insufficient to ensure that MeHg contamination of fish is not worsening for both wildlife and human consumers, as any additional contributions to the river and creeks have the capacity to bio-accumulate further in these fish, and their predators.

It is likely that a root cause analysis will find that a net transport of long resident mercury to the river is occurring as a result of mining activities such as the existing dewatering at the Victor site. Regardless of the cause, these monitoring results should trigger such a root cause analysis as (a) an obligation and priority of the current operation and also (b) as a pre-requisite to any further consideration of project expansion, including additions to the existing works, or additional pits in the vicinity.

In our opinion, trigger values adopted as conditions of these industrial works are too unclear to respond predictably to these circumstances. For example:

> *"If, from the analysis defined in Section 4.5, it appears that measured, or projected, increases in pike flesh mercury concentrations, due to Project-related influences, are likely to increase by greater than 10%, then a comprehensive risk assessment will be undertaken.[3]"*

This trigger employs too many criteria to provide clarity to any user. It could be suggested now that the available evidence projects a substantial likelihood that Pike will assume at least 10% additional body burden, but it would of course assume many things including time lags which are not identified in this criteria at all (we could perhaps assume the "long-term" general purpose criteria of the OWRA as a stand-in). Our point is that these triggers are demonstrably not responsive to (a) the current context of mercury and the risks it presents as a baseline, (b)

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[3] *AMEC 2008. Trigger Values for Mercury Concentrations and/or Body Burdens in Fish Condition 6(10) of Certificate of Approval #8700-783LPK. Pg 14.*

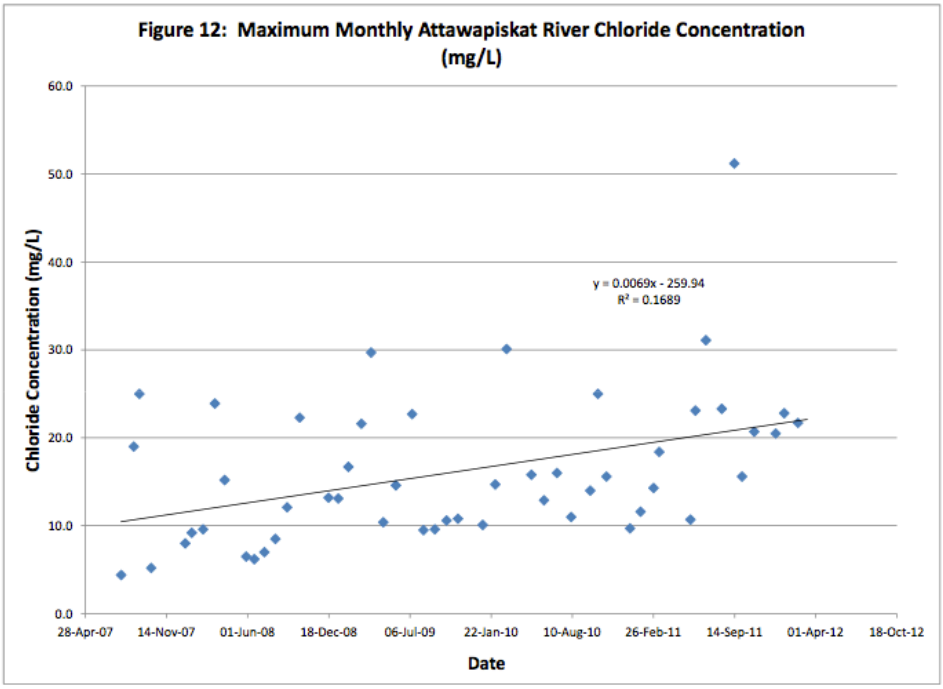
the additionality of effluent contributions relative to any management goal, (c) the cumulative nature of past, current, and future activities (including the proposed expansion to a new pit in the same vicinity), nor (d) the full provisions and advice provided in the often-cited 2003 CCME guidelines for direct exposure of aquatic life (see further below for more commentary on this).

That Pike was selected as an indicator species helps to illustrate the intrinsic bio-accumulation obligation of these triggers, as their pathway to exposure as a predator species is well understood. Their tissue will likely be responsive to elevated levels in their prey, and their prey to elevated levels in their habitat.

(3) Dilution too heavily relied upon to mitigate effluent quality

In the example of Chloride loading, up to 1500mg/L is currently allowed in this discharge authorization (with final mixing zone detection to be below federal guideline of 120mg/L). The original predictions of 1300mg/L at mine life end have now been replaced with the most recent solute transport model indicating that "*the 1,500 mg/L chloride concentration threshold for blending, as per Condition 4(3) of related Certificate of Approval 3960-7Q42G, could potentially be exceeded by a small margin in two to three years from now*."

Within these proposed amendments the proponent is now targeting the water currently authorized for flow supplementation to be instead used to provide further dilution to pit discharge, effectively camouflaging the higher loading than anticipated. It should not be expected that there is an unlimited ability for attenuation in this receiving river. Pre-dilution with separately drawn river water before discharge back to river then using final dilution to mitigate is stretching the mitigation logic of dilution even further.



Transition to a deeper pit can also be expected to result in higher chloride concentrations in either well or sump pit effluent.

> *"RPI is expected to occur at the point where the depth of the pit in relation to well pump positions is such that the dewatering wells will no longer be capable of fully dewatering the pit. At this point a portion of the groundwater will begin to bypass the well draw points and seep into the pit. This bypass seepage (RPI) will have to be pumped from the pit. This condition could be avoided by developing deeper wells, but economics and environmental conditions related to higher chloride concentrations at greater depths do not support the deep well option.[4]"*

At what point is the appropriate mitigation to stop digging deeper into this system? For example, it does not seem unreasonable to expect a cessation / reduction in excavation depth as an alternative scenario to consider against further dilution.

We recommend that this dewatering permit in no circumstances be extended beyond the anticipated advent of any additional industrial works at this time – specifically, we do not support simply extending the current approval to the end of the mine life as proposed.

We further recommend that waters authorized for flow supplementation not be made available for the purposes of additional dilution. Instead, we support a robust analysis that reasonably considers the additional effluent risks of digging the pit deeper within the currently assigned water budgets, and in consideration of other potential mitigation alternatives, if available. It is our position that providing further dilution is authorizing further pollution than the original authorizations allowed, and than the environmental assessment process considered.

(4) Dilution not an acceptable mitigation solution for Mercury

Of particular concern to us is the ongoing reliance on dilution into the Attawapiskat River for mitigating the net contributions of bio-accumulating mercury to this already over-saturated receiving water. While dilution is often relied upon for mitigation of industrial discharge, there are circumstances where it is not appropriate. To us, one of these circumstances is certainly when (a) considering a net addition of a bio-accumulating contaminant into (b) a receiving waterbody which demonstrably poses risks to aquatic, avian, mammal, and human health at background levels.

Fish consumption advisories established for this river, particularly those of higher trophic levels, already clearly indicate human health concerns. The river is variably reported as having a baseline Hg load of 1-2 ng/L THg, with at least .05 ng/L being attributed to MeHg. The 2003 CCME guide advises that:

> *"From conservative assumptions, concentrations of MeHg below 0.007 ng/L may be required to protect all wildlife species in Canada while concentrations above 0.2 ng/L may pose a risk to wildlife species. MeHg concentrations in water between these limits may be hazardous to some wildlife depending on their feeding habits (preferred prey items, and the trophic level and BAFs of these prey items)."*

[4] *AMEC (June 2009). Mercury Performance Monitoring, 2008 Annual Report Certificate of Approval #3960-7Q4K2G Conditions 7(5) and 7(6). Page 7.*

It is difficult to imagine that these discharge authorizations would be issued, or tolerated, in a similar circumstance in a developed watershed, in southern Ontario for example.

Methylmercury is the dominant species of concern in the bio-accumulation of mercury, with usually 95% of the total mercury body burden existing, and being accumulated in this form. The guideline being relied upon for methylmercury (CCME, 2003) is quite clear on its application:

> "*This guideline is recommended for the protection of low trophic level freshwater life (i.e., generally trophic levels 1-2) against the adverse affects of direct exposure to methylmercury through water. This guideline may not protect high trophic level aquatic life (i.e., generally trophic levels 3 and 4) which are exposed to methylmercury primarily through food. Nor may it prevent the accumulation of methylmercury in aquatic life which could cause the tissue residue guideline (33μg·kg^{-1} diet ww) for the protection of wildlife consumers of aquatic biota to be exceeded (Environment Canada 2002).*"

Despite this, the 4 ng/L limit for direct exposure to methylmercury (and the 26 ng/L limit for THg) is treated like the acceptable loading of the Attawapiskat River by this proponent to date. It is referenced extensively in all associated authorizations for this project. Also, in the 2012 mercury performance report submitted to MOE in June 2012, effluent was reported with total mercury concentrations which averaged 1.65, 1.12 and 2.07 ng/L in 2009, 2010 and 2011 respectively with some reported values exceeding 4 ng/L. The important perspective is that, as these numbers are generally higher than the reported background values of the river (1.4-1.5 ng/L Thg), a **net** loading is occurring.

For a bio-accumulating contaminant, this means that additional risks to VECs are being increasingly contributed to the system by the proponent. It is our understanding that these are not mitigated by diluting one high concentration of a contaminant into another already high receiving body. Pretending that the river has more assimilative capacity by misusing a guideline intended for another purpose does not seem appropriate to us.

We do not concur with the proponent's simplistic interpretation of the 2003 CCME Guideline for mercury exposure, nor the current use of dilution as a mitigation approach to the additional loadings (see more below on our position on the misinterpretation of this guideline).

(5) Potential for further mercury methylation from projected sump-assisted drainage of open pit

DeBeers predicts that the drawdown cone is not expected to increase because deeper groundwater is being encountered as pit is excavated deeper, and shallower peat systems surrounding pit appear to be "perched".

> *"Groundwater data for all four cluster sites show that water levels have been holding at baseline values for the muskeg (peat) horizon (Figures 8, 9, 10 and 11), demonstrating thus far, as predicted in the federal EA and in the 2007 and 2008 PTTW application support documents, that the muskeg systems are is essentially perched and not prone to well field dewatering effects except in the immediate vicinity of bioherms where the insulating (aquitard) effects of the marine sediments are more limited or absent.*[5]"

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[5] *De Beers Canada Inc. (February 2013). Permit to Take Water Amendment Application for Mine Dewatering. Page 10.*

In its earlier assertions that elevated MeHg levels was not a result of peat dewatering, DeBeers previously attributed sulphate-rich deep groundwater from excavations into bedrock as a contributing factor.

> *"Methyl mercury concentrations in the SWF and the NEF, both of which receive (or received) effluents from excavations into bedrock, showed elevated methyl mercury concentrations compared with the control fens (SEF and HgCon). The elevated methyl mercury concentrations in both instances are attributed to suphate-rich effluent waters which stimulate the mercury methylation process, and are not a function of well-field dewatering effects.[6]"*

Now it is establishing that their operations will be increasingly dewatering deeper bedrock groundwater, as the pit is dug further.

> *"RPI is expected to occur at the point where the depth of the pit in relation to well pump positions is such that the dewatering wells will no longer be capable of fully dewatering the pit. At this point a portion of the groundwater will begin to bypass the well draw points and seep into the pit. This bypass seepage (RPI) will have to be pumped from the pit. This condition could be avoided by developing deeper wells, but economics and environmental conditions related to higher chloride concentrations at greater depths do not support the deep well option.[7]"*

If in fact their original assertions are correct, the possibility of increased methylation seems much greater as a result of this operational shift to deeper excavation.

(6) Inappropriate reliance on the Canadian Water Quality Guidelines for the Protection of Aquatic Life "direct" values for mercury[8].

The proponent relies upon the direct exposure guideline values for THg and MeHg presented in the 2003 guideline: 26 ng/L and 4ng/L respectively. The purpose of these guides is for direct lethal exposure. It is explicitly not to protect aquatic, avian, mammals, and humans from indirect effects, such as bio-accumulation in the food chain:

> *"The protocol does not address exposure through food or bioaccumulation to higher trophic levels. As such, aquatic life that are exposed to methylmercury primarily through food (e.g., piscivorous fish) may not be adequately protected. Moreover, these WQGs for mercury may not prevent the accumulation of methylmercury in aquatic life; therefore, through this process the tissue residue guideline (TRG; 33 µg MeHg/kg ww) for the protection of wildlife that consume aquatic life may be exceeded (Environment Canada 2002). Thus, if the ultimate management objective for mercury is to protect high trophic level aquatic life and/or those wildlife that prey on aquatic life, more stringent site-specific application of these water quality guidelines may be necessary (see Additional Considerations).[9]"*

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[6] *AMEC (June 2009). Mercury Performance Monitoring, 2008 Annual Report Certificate of Approval #3960-7Q4K2G Conditions 7(5) and 7(6). Page 14.*

[7] *Ibid, Page 7.*

[8] *Canadian Council of Ministers of the Environment. 2003. Canadian water quality guidelines for the protection of aquatic life: Inorganic mercury and methylmercury.*

[9] *Ibid, Page 2.*

Additionally, it (a) identifies the 4 ng/L for MeHg as being an "interim guideline", and (b) one that "may not protect fully high trophic level fish". Clearly the authors intended a substantial amount of caution be used with this application.

The guideline also stipulates that:

> *"To attain the highest degree of environmental protection, all Canadian Environmental Quality Guidelines for mercury (water, sediment, tissue, and soil) should be applied concurrently."*

This means that the authors expected that the 2000 CCME MeHg tissue guideline for wildlife consumers of aquatic biota[10] would also be respected. This latter guideline recommends 33 µg/kg ww, as the Canadian tissue residue guideline for MeHg for the protection of wildlife that consume freshwater, marine and estuarine biota. In the absence of other established guidelines, this guideline also identifies the 1997 US EPA water concentrations as being intended to protect avian and semi-aquatic mammal wildlife from ingesting more than their safe doses of mercury:

> *"Recommended water concentrations of 50 pg MeH/L and 641 pg THg/L are intended to protect avian wildlife from ingesting more than the safe daily dosage, or Reference Dose (RfD) of 21 µg/kg bw per day and to protect semi-aquatic mammals from ingesting more than 18 µg/kg bw per day."*

This reference translates into 0.641 ng/L of THg and 0.05 ng/L MeHg, both measures which are currently already exceeded in the Attawapiskat River baseline. While these reference numbers have no legal applicability to this jurisdiction, they represent the most relevant level of protection from an ecosystem perspective. In the absence of an equivalent, more regionally specific reference intended for the same purpose, it is our position that this type of approach is the appropriate one to consider for assessing loading risks from this type of application.

If the 2003 direct exposure guideline is to be relied upon so heavily by the proponent, it is critical that all aspects of it be considered as written. To be citing adherence to direct exposure guidelines cannot be expected to protect the Valued Ecosystem Components within this system, and ignoring the extensive provisos included in the guideline intended to warn about this is not acceptable to us.

It is our position that considering only direct exposure limits to aquatic life is <u>not appropriately protective</u> to this particular context.

We recommend a revisiting of all authorizations associated with this project through the lens of responsible protection of all trophic levels of fish, avian, mammal, and human life associated with the food chain of the Attawapiskat River. It is appropriate to do this at this time, as the proponent is just now considering (a) deepening the pit and relying upon additional sewage works, and (b) expanding the life of the site by digging additional pits in the vicinity (see CEAA for details of the proposed Victor expansion project, not mentioned anywhere in this application).

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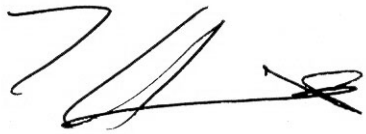
[10] *Canadian Council of Ministers of the Environment. 2000. <u>Canadian tissue residue guidelines for the protection of wildlife consumers of aquatic biota: Methylmercury</u>.*

Any questions regarding these comments may be directed to:



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