

**Ministry of
the Environment**

Environmental Approvals
Branch

2 St. Clair Avenue West
Floor 12A
Toronto ON M4V 1L5
Tel.: 416 314-8001
Fax: 416 314-8452

**Ministère de
l'Environnement**

Direction des autorisations
environnementales

2, avenue St. Clair Ouest
Étage 12A
Toronto ON M4V 1L5
Tél : 416 314-8001
Télec. : 416 314-8452



August 6, 2013

Mr. Louis Lapierre
Panel Chair
Marathon Joint Review Panel Secretariat
160 Elgin Street, 22nd Floor
Ottawa ON K1A 0H3
MarathonMine.Review@ceaa-acee.gc.ca

Dear Mr. Lapierre:

Thank you for your letter which was received on July 12, 2013, inviting the Ontario Ministry of the Environment (MOE) participate in the public review and comment period on Stillwater Canada Inc.'s responses to the Information Requests (IR) issued by the Panel on November 26 and December 19, 2012, for the Marathon Platinum Group Metals-Copper Mine Project. The MOE appreciates the extension provided by the Panel for completing our review, due to the oversight of missing the MOE when the letters were originally sent out to government departments.

MOE staff have completed a review of the IR responses, coupled with the information in the Environmental Impact Statement (EIS), as it relates to MOE's mandate, and have provided comments about whether the responses sufficiently address the IRs that were issued by the Panel, and the technical merit of the information provided in response to the IRs.

The responses that MOE found sufficient, as well as responses that do not warrant further information requests, but for which MOE has some outstanding concerns and comments for the Panel's consideration, can be found in Table 1, which is broken down by key topic. Some of the comments relate to expectations or requirements that the MOE will have of the proponent, if the project is approved through the Joint Review Panel process, and the proponent proceeds to the permitting stage.

It should be noted that for a number of items related to hydrogeology and surface water (IRs 9.3.1, 9.7, 9.9, 24.15, 24.17), MOE technical staff are not able to provide a final assessment of the additional information, due to some uncertainties that have been raised by Natural Resources Canada (NRCan). These concerns are related to the assessment of the potential metals leaching and Acid Rock Drainage (ARD) production (related to IRs 9.3.3, 9.4.1, 9.8). If the Panel determines that these uncertainties need to be addressed, and if this results in changes to the information provided in the EIS and IR responses, this will require further review by the MOE and may result in changes to the nature of MOE's comments. While MOE did not include these points as new IR requests, the MOE would like to ensure that the Panel is aware of the potential for additional information requirements as part of this JRP process, pending the

outcome of the review of the applicable comments from NRCan. The specific concerns and the implications to MOEs review are described in the comments section in Table 1 under the surface water and hydrogeology sections, for the IRs noted above.

MOE also identified additional information requests related to surface water, noise assessments and general project evaluation and assessment. The specific information requests can be found in Table 2, along with the rationale for these requests.

Should you have any questions regarding MOE's responses, please feel free to contact Ms. Alissa Sugar, Special Project Officer of the Environmental Approvals Branch, at 416-314-8311 or alissa.sugar@ontario.ca.

Yours sincerely,

<original signed by>

Agatha Garcia-Wright
Director
Environmental Approvals Branch

Attachments:

Table 1 – Summary of sufficiency review and additional comments for consideration
Table 2 – Additional information requests

Cc: John Taylor, Director, Northern Region, Ministry of the Environment

Table 1 – MOE sufficiency review and additional comments for consideration

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
Atmosphere			
423	10.9	MOE-AQA-1	Sufficient
434	10.10.1	MOE-AQA-2	Sufficient
373	10.5	MOE-AQA-4	Sufficient
445	10.11	MOE-AE-1 MOE-AE-3	Sufficient
373	10.10.2	MOE-AE-4	Sufficient
445	10.12	MOE-AE-6	Sufficient
443	5.2	MOE-AE-7	Sufficient
373	10.13	MOE-AM-2	Sufficient
373	10.8.2	MOE-AM-2	Sufficient
445	10.8.3	MOE-AM-3	Sufficient
Noise			
444	11.6	MOE-Noise-1 MOE-Noise-2	Sufficient
374	11.7	MOE-Noise-3	Sufficient
374	11.8	MOE-Noise-4	Sufficient
395	11.9	MOE-Noise-7	Sufficient
374	11.10	MOE-Noise-8	Sufficient
374	11.11	MOE-Noise-9	Sufficient
392	6.3	MOE-Noise-12	Sufficient
Surface Water			
445	12.1.1	MOE-SW-1	<p>The purpose of baseline studies is to characterize the physical, chemical, and biological aspects of potentially impacted watersheds. Components of the project that include water takings, effluent discharges, groundwater seepages, and surface drainage, as a minimum, must be considered when designing the baseline study.</p> <p>The design of the baseline surface water monitoring program needs to include multi-year seasonal sampling to identify temporal variability associated with the collected data and to identify trends over time. Monitoring programs must be designed to statistically detect changes from baseline conditions.</p> <p>Surface water, sediment, benthic, fish community and fish tissue samples should be collected from all locations within the predicted zone of influence of the project including direct discharge locations, surface drainage locations, areas of water taking, and</p>

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			<p>areas that may be influenced by groundwater takings.</p> <p>The following needs to be considered when selecting sampling locations:</p> <ul style="list-style-type: none"> • adequacy to produce high quality samples that can be replicated; • effectiveness of the location to define baseline conditions; • use of the location for long term evaluation of potential effects of the project; and • development of a reference condition for the watershed to facilitate comparisons with non-impacted watersheds and to evaluate watershed changes. <p>Effluent discharge criteria will be receiver-based and will most likely be more restrictive than MMER. Because baseline/background information is used in the development of receiver-based effluent criteria, the physical, chemical, and biological conditions of the receiving waterbodies (Hare Lake, Pic River, Stream 6 (at closure)) must be adequately characterized prior to the provincial permitting process.</p> <p><u>Bathymetry</u></p> <p>This response is adequate.</p> <p><u>WQ sampling at depth</u></p> <p>Multiple sampling stations in Hare Lake are not proposed in the IR response. Only one location is currently being sampled at depth for water quality parameters. Multiple stations in Hare Lake may be required based on updated bathymetry information. Three sampling events are planned for the ice-free season, in order to provide data for spring, summer and fall. A winter sampling event should be included. In addition, samples need to be collected for multiple years to assess temporal variability.</p> <p>More detailed information on Hare Lake depth profiles will be required prior to provincial permitting.</p> <p><u>Water column profiles</u></p> <p>Dissolved Oxygen (DO) is not currently being recorded by the sensors deployed in Hare Lake at the mid-lake sampling location. The 3m depth intervals will most likely be reflective of the epilimnion, metalimnion and hypolimnion in the deepest point of</p>

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			<p>the lake. However, profiles were only collected from one location within the lake (deepest point) rather than multiple stations. The 3 m interval may not be sufficient if sampling is conducted from more shallow areas of the lake. Updated bathymetry is required to confirm that a single sampling location is sufficient. Monthly profiles should be collected for, at minimum, temperature, DO, and conductivity, to provide an understanding of temporal variations in lake stratification. Sampling for other water quality parameters in the water column should also be conducted on a monthly basis. One year of data will not be sufficient to understand inter-year variability. This information will be required at the provincial permitting phase to adequately characterize seasonal variations in Hare Lake.</p> <p>Based on the proponent's response, further work is needed to complete the final modeling of effluent discharge to Hare Lake. No further information was provided in regards to definition of a mixing zone boundary. The proponent intends to complete a modeling exercise prior to provincial permitting. However, in order to assess potential impacts to Hare Lake during the EA, further information needs to be provided.</p> <p>An additional information request has been proposed (see Table 2 – Issue #3). The absence of modeling elements precludes any decision making on the impacts to the receiving waterbody.</p>
396	12.2.1	MOE-SW-6	<p>This response is adequate for the purposes of the EA.</p> <p>Variability in benthic studies can be attributed to flow differences and differences in substrate composition at the time of sampling. In order to produce reliable results, the same stations should be sampled at the same time of year (spring or fall) to reduce these sources of variability. The proponent should note that further benthic sampling will be required to increase confidence in these results prior to provincial permitting.</p>
403	12.2.2	MOE-SW-16 MNR-A-18	<p>This response is adequate for the purposes of the EA.</p>
375	12.3	MOE-SW-1	<p>In order to assess potential impacts of mine effluent, PGM's need to be included parameters for the baseline samples (water and sediment quality) to allow changes in concentrations of PGM's to be detected in the receiving environment. In addition, as toxicological information becomes available for PGM's, provincial or federal guidelines may be developed to allow for assessment of impacts. The proponent should note that adequate baseline data, including PGM analysis, will be required as part of the provincial permitting process.</p>

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			The response is adequate for the purposes of the EA.
375	12.4	EC-15	The response is adequate for the purposes of the EA.
445	12.6.2	MOE-SW-13	<p>Visual observation of groundwater discharges to surface water may not be acceptable to determine potential areas of groundwater influence. Temperature should be used as an indicator of groundwater influence. Further work should be done prior to provincial permitting to identify areas of groundwater influence on surface water bodies, specifically in areas where seepage from waste rock storage is expected.</p> <p>The response is adequate for the purposes of the EA.</p>
424	12.10.1	MOE-EA-14	<p>The response is sufficient for EA purposes. A monitoring program will be defined in the Environmental Compliance Approval (ECA) for the site. Effluent limits and/or objectives may be stipulated in the ECA. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.</p> <p>Baseline conditions and mercury inputs must be defined prior to provincial permitting.</p>
424	12.10.2	MOE-SW-3	<p>The response is sufficient for EA purposes. A monitoring program will be defined in the Environmental Compliance Approval (ECA) for the site. Effluent limits and/or objectives may be stipulated in the ECA. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.</p> <p>Baseline conditions and mercury inputs must be defined prior to provincial permitting.</p>
408	12.11	MOE-SW-2	<p>The proponent has stated that water quality modeling shows that, even without treatment, the concentrations of COPC's on Hare Lake during periods of discharge will meet PWQO outside of the mixing zone. The proponent also states that modeling of the effluent discharge to Hare Lake will be provided during provincial permitting.</p> <p>The mixing zone boundaries and expected concentrations within the mixing zone are not defined.</p> <p>An additional information request has been proposed to address this (See Table 2 – Issue 3). The absence of modeling elements precludes any decision making on the impacts on the receiving waterbody.</p> <p>In both the IR response and the meeting held on July 10, the</p>

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			proponent indicates that TDS values will be approximately 200 mg/L; therefore meromixis is unlikely to occur. During the provincial permitting process, an effluent limit and/or effluent objective for TDS will be considered for inclusion in the ECA. A monitoring program will be defined in the ECA for the site. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.
396	12.13	MOE-SW-8	The response is adequate for the purposes of the EA. However, the proponent should note that Stations S30 and S31 should be added to future baseline programs to provide data representative of the upper reaches of Hare Creek and Stream 6, as they will both receive effluent-influenced discharge. It is recommended that benthic samples be collected at the same stations as water, sediment and fish data.
397	13.7	MOE-SW-4	The response is adequate for the purposes of the EA. However, the proponent should note that additional work is needed to collect sufficient baseline data to assess fish tissue concentrations prior to the start of mining operations. This information will be required prior to the provincial permitting process. The proponent has indicated that a pre-operational study will be conducted using EEM methodology. However, it is important that the proponent provides statistically robust data to detect changes from pre-mining conditions.
406	4.2.4	MNR-EA-19 PMFN/PPFN-21	The proponent indicated that Hare Lake was selected because it provided sufficient capacity, was not a sensitive cold water fishery and minimized pipeline related disturbances. Although the MOE does not agree with this statement, the response does indicate why the other locations were not acceptable. However, given the potential for impacts to Hare Lake, receiving-water based effluent criteria will be required and the mixing zone will be required to be as small as possible. The proponent is reminded that effluent limits stipulated in the ECA are likely to be more conservative than MMER.
425	13.2.2	MNR-A-12	The response is adequate for the purposes of the EA. However, the proponent should note that additional site investigations are needed to determine the presence/absence of fish species and to document baseline fish health conditions. This information will be required prior to the provincial permitting process.
409	13.5.2	MNR-A-20 MiningWatch	The response is adequate for the purposes of the EA. A monitoring program will be defined in the provincial ECA for the site. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.
469	9.10.1	EC-6	Assessment of this response is dependent on the accuracy of the

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		MOE-SW-15 CRINO	<p>source concentration predictions, which NRCAN has expressed concerns over. Because of the uncertainty introduced by NRCAN's concerns, this response cannot be adequately assessed.</p> <p>A monitoring program will be defined in the provincial ECA for the site. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.</p>
453	9.10.2	MOE-SW-14	This response is adequate for EA purposes. A monitoring program will be defined in the provincial ECA for the site. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms.
411	24.11	EC-21	This response is adequate for the purposes of the EA.
468	24.15	MOE-GW-1 MOE GW-8	<p>Assessment of this response is dependent on the accuracy of the source concentration predictions, which NRCAN has expressed concerns over. Because of the uncertainty introduced by NRCAN's concerns, this response cannot be adequately assessed. Once NRCAN's concerns have been addressed, the updated source concentrations will need to be reviewed in order to evaluate the impact to surface water, as resolution of NRCAN's concerns could result in a considerable increase in contaminant loadings.</p> <p>The predicted discharge concentrations, indicated in this IR response, exceed PWQO. Although these are conservative values which do not take attenuation into consideration, values may still exceed PWQO in the actual discharge.</p> <p>A monitoring program will be defined in the provincial ECA for the site. A contingency plan will be required and the potential contingencies will be identified in the ECA, along with appropriate trigger mechanisms. Discharge criteria will be considered during the provincial permitting process and will consider the assimilative capacity of the waterbody receiving the groundwater seepage.</p>
449	24.16	MOE-GW-3 MOE GW-5	This response is adequate for the purposes of the EA. A monitoring and contingency plan will be required, along with appropriate trigger mechanisms.
470	24.17	DFO-3 MNR-A-17 MNR-D-2 EC-22 EC-10 EC-18 EC-23 EC-26 EC-26	<p>The site water balance is based on a conceptual model. On-going validation of this model will be required, both prior to provincial permitting and during mine operations, in order to confirm assumptions and/or update water balance predictions as necessary.</p> <p>Modifications or alterations of operational designs may be required based on updated water balance modeling and contingencies may be identified in the ECA, in conjunction with</p>

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		EC-27 EC-28	appropriate trigger mechanisms.
390	2.1	MOE-EA-5	A table was provided in the response to IR 2.1. This response is sufficient.
Groundwater			
391	4.3.5		<p>Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>The use of injection grouting to decrease permeability of the bedrock where $K > 10^{-4}$ cm/s has been identified. This is a favourable approach and will be reflected in the ECA for the PSMF. Details on how areas requiring grouting will be identified (i.e. will the entire area be stripped of overburden) can be detailed in the ECA. The extent of grouting will be dependent on impacts attributed to seepage, and development of the ECA conditions may require more extensive grouting than described in the EIS to further reduce seepage volumes (depending on resulting impact to surface water receivers). This grouting will be a major mitigation measure inhibiting seepage from the PSMF. Further to this, a groundwater monitoring program will be in place to determine that groundwater outside the PSMF is not being impacted, and contingency measures have been identified that can be implemented if monitoring reveals impacts. The monitoring program will be detailed in the MOE's ECA for the PSMF, and the ECA will also include requirements for implementation of contingency measures dependent on the groundwater monitoring results.</p> <p>As stated by the proponent, seepage from the pit will not be an issue until the water level in the pit fully recovers post closure. Until that time, groundwater flow will be into the pit. However, once the pit water level has recovered, seepage is a possibility. Theoretically, upon complete recovery of the water levels in the pit, all PAG waste rock will be submerged, and therefore there will be no potential for acid generation. However, metal leaching can occur under neutral conditions, so there is some potential for metals concentrations in the pit water to become elevated. To address this, a sampling program will be put in place for the pit water. The monitoring program will be defined in the MOE's ECA for the site. The ECA will also prescribe a groundwater monitoring program to confirm the quality of seepage from the pit. The</p>

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			proponent has identified potential contingencies for seepage from the pit, and the contingencies would be identified in the ECA, along with appropriate trigger mechanisms.
444	9.3.1	MOE-GW-6	<p>NRCan has identified significant concerns regarding some aspects of the proponent's assessment of the potential metals leaching and ARD production (see NRCan comments re: IR's 9.3.3, 9.4.1 & 9.8), and is of the opinion that contaminant concentrations and loadings could be significantly greater than the estimates provided, and that the volume of Type 2 material may also be greater than estimated. These concerns are outside of MOE's expertise, and therefore the resolution of these concerns could impact on the conclusions provided below, which are made based on the data that has been presented.</p> <p>Based on the data presented, the response provides a detailed description and update to this data, and is acceptable for current purposes.</p>
372	9.7	NRCan EC	<p>NRCan has identified significant concerns regarding some aspects of the proponent's assessment of the potential metals leaching and ARD production (see NRCan comments re: IR's 9.3.3, 9.4.1 & 9.8), and is of the opinion that contaminant concentrations and loadings could be significantly greater than the estimates provided, and that the volume of Type 2 material may also be greater than estimated. These concerns are outside of MOE's expertise, and therefore the resolution of these concerns could impact on the conclusions provided below, which are made based on the data that has been presented.</p> <p>In consideration of this response in conjunction with the original EA documentation and other related IR responses, the EA has clearly identified that PAG rock and tailings pose a risk for ARD production, and the EA has clearly identified suitable mitigation measures, monitoring requirements and possible contingency measures. Based on the technical review of the current data, without resolution of the concerns raised by NRCan regarding ARD and metals leaching, the outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>If the NRCan concerns (IR's 9.3.3, 9.4.1 & 9.8) have basis, it is possible that the proponent may have to change the plan for handling Type 2 waste rock and process solids. In this case, the MOE would require that the EIS be updated with this information, and that the updated plan would require review prior to proceeding.</p> <p>With respect to the faults at the site, the assessment of hydraulic</p>

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			<p>conductivity seems to be limited to one packer test in an area of one fault that was healed. SID11 does report on 2 boreholes that separated another fault. In this case no testing was done, and this fault was infilled with clay, not competent rock, indicating the possibility of higher permeability. The assumption that the faults do not have a significant impact on groundwater flow may be optimistic, as the data on these faults is sparse. In the area of the PSMF, the faults are at depth, and would likely not have a strong influence on the seepage. However, it would be good if the groundwater modelling considered the possibility of the faults having limited higher hydraulic conductivity, and determine the sensitivity of the model to this possibility. This will definitely require further investigation for the ECA application, to determine if the PSMF will require design features to isolate the fault(s). However, based on the technical review, the topic appears to have been addressed for the purposes of the EA.</p> <p>The proponent's assurance of complete separation of PAG and non-PAG waste at source and within the processing plant may be overly optimistic, and it seems quite possible that this separation may be difficult to achieve at times in the mine life. It therefore seems reasonable that PAG material will get mixed in with non-PAG material during the mine life. Although this mixing will increase the risk of ARD, as it would then be possible that PAG material is not adequately submerged, this risk will should be adequately managed by the monitoring and contingency plans that will be associated with both the PSMF and the WRMA. Details of the monitoring plans, and limits for assessment which would trigger contingency measures will be developed as part of the MOE's process for the ECA for the facility.</p>
444	9.9	MOE-GW-2	<p>NRCAN has identified significant concerns regarding some aspects of the proponent's assessment of the potential metals leaching and ARD production (see NRCAN comments re: IR's 9.3.3, 9.4.1 & 9.8), and is of the opinion that contaminant concentrations and loadings could be significantly greater than the estimates provided, and that the volume of Type 2 material may also be greater than estimated. These concerns are outside of MOE's, and therefore the resolution of these concerns could impact on the conclusions provided below, which are made based on the data that has been presented.</p> <p>In consideration of this response in conjunction with the original EA documentation and other related IR responses, the management of Type 2 rock has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p>

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			<p>If the NRCan concerns (IR's 9.3.3, 9.4.1 & 9.8) have basis, the proponent will need to reassess the proposed plans for handling both Type 2 waste rock and Type 2 tailings to address the increased volumes. In this case, the MOE would require that the EA should be updated with this information, and that the updated plan would require review prior to proceeding.</p> <p>The response clearly identifies that both groundwater and surface water monitoring will be required. The specifics of the monitoring would be best addressed in the permitting and approvals process.</p> <p>To address the potential metals release upon relocation and submergence of the Type 2 rock, monitoring and pH adjustment are recommended. The monitoring and contingency measures can be more clearly established in the MOE's approvals and permitting process.</p> <p>The response on time to submerge the waste rock is suitable. However, NRCan's concerns indicate that the quantity of Type 2 rock could be greater than considered here, which would result in a considerably longer period of exposure for the material disposed in the pits. Depending on the response to NRCan's concerns, this may need to be revised.</p> <p>The response to IR24.15 provides a more detailed discussion of the release of contaminants from the site, and will be discussed in that section.</p>
399	24.3	NRCan- 5 MOE-GW-4	<p>Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>Although there are areas of the site where subsurface investigation data is sparse, the data has been used conservatively, and appropriate assumptions have been made. As the project progresses, further field data will be required to validate assumptions and modeling. Outstanding details would be best addressed through the MOE's permitting and approvals process. The ECA will likely include requirements to update groundwater models on a regular basis throughout the mine life to refine and confirm the modeling results based on the monitoring data.</p> <p>Although the technical review indicates that the proponent has generally been appropriately conservative with the assumptions</p>

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			<p>and modeling used for assessment, there should have been more discussion of how the limitations of the field program were addressed in the model.</p> <p>Additional wells will almost certainly be required for permitting, but considering that the modeling was generally conservative, the fieldwork program is adequate for the purposes of the EA.</p> <p>The technical review confirms that no additional deeper wells are required at this time, but that deeper wells will likely be required to proceed with permitting and approval and for the long term monitoring at the site.</p>
380	24.5		The response is adequate for the purposes of the EA. There are no outstanding concerns.
380	24.6.1	MOE-GW-11	Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.
380	24.6.2	MOE-GW-9	<p>Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>The response states that there is no evidence that anisotropy does not exist. The converse is also true though – the consultant has provided no evidence that anisotropy does exist. This does not necessarily justify the assumption of the model.</p> <p>Cherry does indicate that anisotropy is common in fracture rock due to directional variations in fractures and joints. However, contrary to the assumption used in this model, the Cherry reference (pg 34) indicates that the vertical hydraulic conductivity (Kz) is commonly greater than the horizontal (Kx).</p> <p>The consultant has tested the model sensitivity to the Kh:Kv by doing one model where Kh>Kv and one where Kh=Kv. The model has shown fairly low sensitivity to this variation. Most significantly, it illustrates that horizontal flow, which is the primary concern with respect to discharge to surface water features, varies very little, even decreasing in some scenarios, and that the most significant increase is in the vertical component, which represents a much smaller portion of the flow.</p>

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			<p>The consultant has not confirmed the anisotropy of the hydraulic conductivity, and it is possible that $K_v > K_h$. This possibility has not been tested.</p> <p>For the purposes of the EA, and considering that generally conservative K values have been used, the model provides a reasonable estimate for the purpose of the EA, but for ECA and PTTW approval, more work will be required to determine K_v vs K_h. The model has not been shown to be particularly sensitive to $K_v:K_h$, and therefore the model results are appropriately conservative for the purposes of the EA.</p>
380	24.7	MOE-GW-10	<p>Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>The response indicates that the bedrock at depth was evaluated based on 6 boreholes completed in the vicinity of the pit. However, there has been no investigation of the deeper bedrock in the vicinity of the PSMF. Based on the technical review the groundwater modeling is based on conservative assumptions and addresses this adequately for the purpose of the EA. However, some further investigation of the deeper bedrock in the vicinity of the PSMF will be required for the MOE's permitting and approvals processes.</p> <p>The actual field data available for assessment of the at depth fracturing is very limited, most data being from just the one borehole. This results in a high degree of uncertainty in characterization of the hydrogeological characteristics of the deeper fractures/fault systems. It seems unlikely that further field work to better characterize this feature(s) will be undertaken at this stage, so the proponent needs to clearly identify how the model is appropriately conservative, and how monitoring, mitigation and contingencies will be able to address this uncertainty. This information is not required, but would be useful to support the EA findings prior to completing the EA.</p> <p>In general, the values that have been used for the modeling are reasonable. However, there are inaccuracies inherent in estimating hydraulic conductivity, and these will be reflected in the modeling results.</p>
468	24.15	MOE-GW-1 MOE GW-8	<p>NRCAN has identified significant concerns regarding some aspects of the proponent's assessment of the potential metals leaching and ARD production (see NRCAN comments re: IR's 9.3.3, 9.4.1 &</p>

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			<p>9.8), and is of the opinion that contaminant concentrations and loadings could be significantly greater than the estimates provided, and that the volume of Type 2 material may also be greater than estimated. These concerns are outside of MOE's expertise, and therefore the resolution of these concerns could impact on the conclusions provided below, which are made based on the data that has been presented.</p> <p>Because of the uncertainty introduced by NRCan's concerns, the technical adequacy for the purposes of the EA cannot be assessed. If as a result of NRCan's concerns (IR's 9.3.3, 9.4.1 and 9.8) the source concentrations of metals are determined to be considerably greater than presented in this response, the MOE will require this response be revised to reflect the updated values, and this response will be re-evaluated for purposes of the EA.</p> <p>Assessment of this response is highly dependent on the validity of the source concentration data, which has been called into question by NRCan. Apart from the concerns regarding source concentrations, the response provides suitable and appropriate analysis to determine discharge concentrations from groundwater seepage into the surface water receptors.</p> <p>The MOE surface water specialist will review the discharge values with respect to the acceptability of the discharge quality. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>The response provides a clear and easily understood summary of the derivation of the loading rates for critical contaminants discharging to each of the surface water receivers. The values presented are suitable for determining impacts on the surface water features, and determining assimilation capacities for the purposes of an ECA for operation of the tailings and waster rock facilities. However, the actual values cannot be evaluated until NRCan's concerns regarding quantification of metals leaching have been resolved.</p> <p>In determining the discharge concentrations, the consultant did not consider dilution/dispersion/attenuation processes. This is highly conservative, and the MOE, for the purposes of our Reasonable Use Policy, allows for the application of simple dilution for the purpose of attenuation.</p> <p>The discharge concentrations as calculated will clearly exceed PWQO's, and background quality in the surface water features. As</p>

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
			<p>presented, the source concentrations would result in groundwater concentrations that would result in changes to the receiver chemistry that is generally within what would normally be considered natural fluctuations and the sampling margin of error. However, as stated above, resolution of NRCan's concerns could result in a considerable increase in source metals concentrations, which would further result in a significant increase in the contaminant concentrations in groundwater discharging to surface water features. It is possible that significantly higher discharge concentrations could result in a more distinguishable impact on the surface water receivers, and that further assessment of these impacts would be necessary. It is therefore recommended that a decision on the acceptability of this response must be deferred until NRCan's concerns have been satisfactorily addressed. Furthermore, if NRCan's concerns have basis, and the contaminant concentrations will be greater, then it will be necessary for the proponent to recalculate the discharge loadings from groundwater to surface water receivers, and most likely an assessment will be required to assess if the impact of this discharge is acceptable.</p> <p>Although the calculations have been conservative by ignoring attenuation, the concentrations are such that attenuation may not reduce values to PWQO. The acceptability of these discharges will be dependent on the sensitivity and assimilation capacity of each water feature. The proponent has identified that if monitoring shows that groundwater discharges to the surface water features will be excessive, then there are contingency measures available to reduce the discharge. With monitoring as proposed in place, the response provides an adequate description of the proposed mitigation measures.</p> <p>The discussion of contingency plans is overly simple, but does provide reasonable options. Further discussion of the feasibility of these measures to actually be implemented at this site would be useful, although they are fairly universal and should be applicable. The contingency measures and appropriate triggers regarding water quality will be integrated into the ECA for the tailings facility (industrial sewage).</p>
449	24.16	MOE-GW-3 MOE GW-5	<p>Based on the technical review of this response in conjunction with the original EA documentation and other related IR responses, this topic has been adequately addressed for the purposes of the EA. Any outstanding details would be best addressed through the MOE's permitting and approvals process.</p> <p>The response provided is satisfactory, and as previously stated, the information and assessment provided is suitable for the EA.</p>

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
			<p>Although pump testing was not completed, the modeling has generally been based on conservative assumptions. As stated by the consultant, the nature of fractured igneous bedrock is such that surface connectivity is likely limited, and the bedrock therefore is unlikely to contribute significantly to baseflow in surface water features. However, more detailed assessment of dewatering effects and refinement of the model will be required by the MOE at the permitting phase of the project, which will require larger scale pump testing be conducted to better quantify the water taking itself, as well as the long term dewatering effects.</p> <p>Dewatering effects on surface water features are not anticipated to be significant, and monitoring and contingency plans that will be required for the PTTW will be able to address the uncertainty.</p>
470	24.17	DFO-3 MNR-A-17 MNR-D-2 EC-22 EC-10 EC-18 EC-23 EC-26 EC-26 EC-27 EC-28	<p>NRCan has identified significant concerns regarding some aspects of the proponent's assessment of the potential metals leaching and ARD production (see NRCan comments re: IR's 9.3.3, 9.4.1 & 9.8), and is of the opinion that contaminant concentrations and loadings could be significantly greater than the estimates provided, and that the volume of Type 2 material may also be greater than estimated. These concerns are outside of MOE's expertise, and therefore the resolution of these concerns could impact on the conclusions provided below, which are made based on the data that has been presented.</p> <p>Based on the data that has been provided, this response provides a comprehensive description of all water management activities, which clearly demonstrates that aspects of water control have been appropriately considered. However, if the NRCan concerns (IR's 9.3.3, 9.4.1 & 9.8) have basis, the proponent will need to reassess the proposed plans for handling both Type 2 waste rock and Type 2 tailings to address the increased volumes. In this case, the MOE would require that the EIS be updated with this information, and that the updated plan would require review prior to proceeding.</p> <p>Although treatment details are not specified, the response clearly explains that treatment will be specific to the waste stream, makes it clear that different waste streams will require different treatment, and that treatment requirements will evolve with the project stages.</p> <p>The water management measures & contingencies committed to will be incorporated into MOE's ECA and PTTW as conditions, ensuring compliance with the EA commitments. The concepts for mitigation and monitoring described here would be expanded and</p>

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
			<p>developed for incorporation into the permitting documents.</p> <p>Clearly identifies groundwater monitoring for potential seepage from the PSMF and MRSA, and that there are contingencies to collect and redirect seepage depending on the quality from the monitoring. Specifics (i.e. monitoring locations & frequencies, applicable criteria, trigger values, implementation of contingencies) would be provided in applications for the ECA/PTTW, and would be incorporated into those control documents.</p> <p>Seepage from the MRSA is to be collected and treated prior to discharge to the Pic River. The ECA will require that the collection (and monitoring) be detailed, and design will require modeling to show the effectiveness of the seepage collection and the requirements for monitoring.</p> <p>Seepage collection for the MRSA, and seepage monitoring with collection as a contingency for the PSMF are both noted. The seepage interception facilities (monitoring and collection, mitigative and contingency) will need to be designed and modeled to illustrate that they are likely to be effective for the purposes of the ECA application.</p> <p>A decision on the adequacy of this response must be deferred until NRCan's concerns (IR's 9.3.3, 9.4.1 & 9.8) can be resolved, as the adequacy of the proposed mitigation measures and the impact of the seepage is dependent on the volumes of Type 2 material and the contaminant concentrations in the seepage derived from the MRSA and PSMF. If NRCan's concerns are shown to be without basis, and the Type 2 volumes and source concentrations reported do not need to be changed, then based on the technical review the information provided is adequate for the purposes of the EA.</p>
EA-related comments			
418	1.1	MOE-EA-9	<p>Comment for consideration:</p> <p>While additional information was provided to explain the business case for the project, as was the rationale for the project, it should be noted that the 'do nothing' alternative to the project is a required component of the alternatives assessment (see new IR related to IR 4.1).</p> <p>As a point of correction in Stillwater's response, one of the factors that are to be considered by the Panel is the rationale or need for the project, as required by the Ontario EAA, and as outlined in the</p>

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
			Joint Review Panel Agreement.
390	2.1	MOE-EA-5	Sufficient
390	2.4	MOE-EA-3	Sufficient
441	5.1	MOE-EA-11	<p>Comments for consideration:</p> <p>While an assessment of both the truck-rail and direct truck alternatives for transport of concentrate has been provided, Stillwater has not yet determined which option it will be pursuing for its project. It is not apparent as to when a decision will be made, so that the details of the project in its entirety will be known. If the truck-rail option is selected, it means that a load-out facility, and its related impacts, will be occurring in the Town of Marathon. As EA is a planning process for proposed projects to understand potential impacts, a decision on the preferred alternative should be made and this information should be provided as part of the EA process.</p>
392	6.1	MOE-EA-7	Sufficient
371	6.2	MOE-EA-12	<p>Comments for consideration:</p> <p>While a cursory overview of possible impacts related to power by diesel generator was conducted, and it is clear the advantages of desiring reliable energy for the project, SCI didn't provide any comparative assessment of the advantages and disadvantages of each option, to demonstrate how the transmission line was determined to be the preferred alternative. Impacts to land clearing, forest fragmentation, loss of bird habitat, creation of a new linear corridor, the additional infrastructure (i.e. substation), etc., are all impacts that should have been weighed against the impacts of diesel generation (See new IR related to IR 4.2.3 for more details).</p> <p>It should also be noted that there is no contingency plan in place in the scenario where the transmission line is not operational by the time the mine operations commence. For construction, four 1 MW diesel generators will be in place; however, SCI notes that for operation, it would require 10 diesel generators to supply the needed 50 MW of power. SCI does not include any indication of the predicted time for the line to be constructed and available for use.</p>
422	7.0	MOE-EA-19	Sufficient
447	12.9.1	MOE-EA-4	Sufficient from EA perspective
424	12.10.1	MOE-EA-14	Sufficient from EA perspective
478	17.2	MOE-EA-18	Sufficient. MOE is satisfied that additional information has been

CEAR DOC	Original Panel IR #	Contributing MOE IR	MOE sufficiency review and comments
			provided to this IR; however, it should be noted that MOE expects Stillwater to continue consulting with the potentially affected Aboriginal communities, including discussions about mitigation and accommodation, if required.

Table 2 – Additional Information Requests

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
Noise					
1	<p>2.7.2.2 Acoustic Environment</p> <p>The EIS will assess the potential for noise effects resulting from the Project. The EIS will:</p> <ul style="list-style-type: none"> <input type="checkbox"/> identify and quantify potential noise sources including reference to construction and operational phases as well as to noise associated with loading concentrate into rail cars and increased road traffic; <input type="checkbox"/> identify and evaluate impacts from noise on potential human receptors, such as lots zoned for use by traditionally sensitive receptors (e.g. provide residences, cottages, trapper cabins) at property lot lines and/or at land use permit boundaries¹⁸; <input type="checkbox"/> describe the proximity of identified receptors to Project components; and <input type="checkbox"/> describe mitigation and noise management measures to be incorporated into a conceptual Noise Management Plan, including the conditions for mitigation and evaluate compliance with 	Panel IR 5.3	<p>Concern:</p> <p>Rail Shunting noise is assessed in terms of an older criterion, higher than both MOE current practice and recent OMB direction</p> <p>Impulsive sound arriving at Points of Reception in Marathon from rail shunting was assessed in the Stillwater Response against a 100 dBAI (A-weighted impulsive decibels) criterion which;</p> <ul style="list-style-type: none"> a) Does not reflect current MOE practice; b) Is replaced by lower figures (no more than 80/75 dBAI (day/night)) in an MOE draft document currently in the approval process; c) Has been recently ruled inappropriate by the Ontario Municipal Board in a very similar rail 	<p>1) The proponent should provide information as to measures required to enable the sound level of impulsive noise emissions from rail shunting operations in Marathon to remain within limits lower than 100 dBAI, such as:</p> <ul style="list-style-type: none"> a) the Ontario Municipal Board’s June 2012 Ruling that 50 dBAI daytime and 45 dBAI nighttime are appropriate limits for in-town receptors of rail shunting noise; <p>or,</p> <ul style="list-style-type: none"> b) The MOE proposed limits for impulsive sound found in Draft NPC-300 (currently in the approval process) of 80 dBAI daytime and 75 dBAI nighttime for no more than one impulse per hour, and lower limits for 	<p>The information is required for the Panel to decide if there is sufficient information to proceed to the public hearing.</p>

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
	<p>appropriate noise guidelines. In completing the assessment of the effects of the Project on the acoustic environment, the Proponent shall use the approach outlined in the Ontario Ministry of the Environment Guidelines, including the following:</p> <p>☐ Ontario Ministry of the Environment. October 1995. <i>Sound Level Limits For Stationary Sources in Class 3 Areas (Rural)</i> Publication NPC-232 (or its successor).</p>		<p>shunting situation, where a limit of 50/45 dBAI (day/night) was mandated instead.</p> <p>Detailed comments on this item are provided in an Appendix to this Table, including Tables of the draft MOE limits referenced in b) above.</p> <p>Rationale: The EIS proposes to assess multiple everyday impulsive noise events from rail shunting by a criterion intended for infrequent events and not recommended for this purpose by either MOE or the Ontario Municipal Board. Use of this criterion would tend to assess the impact of these events as acceptable in some cases where normal MOE practice would not.</p>	<p>more frequent events (see Table B3 and B4 appended to this response Table)</p>	
2	<p>2.6.1.3 Acoustic Environment</p> <p>The EIS shall describe current</p>	<p>Panel IR 11.3</p> <p>From EIS:</p>	<p>Concern: EIS reports unusually high levels of background sound</p>	<p>a) The Baseline ambient noise figures for the named Points of Reception N1-N5</p>	<p>The information is required</p>

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
	<p>ambient noise levels at the site and in the local study areas, and include information on its source(s), geographic extent and temporal variations. The description shall also provide ambient noise levels for other areas which could be affected by the Project, such as along the proposed transmission corridor.</p>	<p>SID 13 Executive Summary (p ii) Section 3.0 (pp 15-16) Section 4.0 (pp 17-18)</p> <p>EIS Main Report Table 6.2-5 (p 6.40)</p> <p>SID 17 Section 2.2.1 (p 10) Section 4.1 (p 24) Section 4.2.1/4.2.2 (p 25) Table 1 Table 2 Table 3 Table 4 Table 5</p>	<p>at remote receptors, inappropriately minimising the possible environmental impact of the project.</p> <p>Although remote rural locations such as some of the Points of Reception can, in the experience of MOE, normally be measured with overnight background sound levels well below 40 dBA (A-weighted decibels) down to 25 dBA, the EIS shows minimum measured sound levels at several locations of 40.0 dBA.</p> <p>The meters that were used for these measurements are not recommended by their manufacturer for levels lower than 40.0 decibels. The manufacturer of the sound level meters used by the consultant has confirmed to this reviewer via email that these meters are not designed for this sort of measurement. The operating manual for one of the meters</p>	<p>should be remeasured under an MOE-approved and well- documented workplan, or;</p> <p>b) If remeasurement is not feasible, the predicted background sound levels generated by the traffic modelling (which was extensively documented in SID 13) should be substituted.</p>	<p>for the Panel to decide if there is sufficient information to proceed to the public hearing.</p>

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			<p>states that the noise floor (generated within the meter itself) is “approximately 35 dBA”, and that the minimum sound level with which the meter should be used is 40 dBA.</p> <p>According to detailed measurement logs provided upon request by the EIS noise consultant, a number of measurements were made with a 40.0 dB “Threshold” setting engaged in the meter. Non-zero thresholds are intended for measurements of occupational (close-up worker exposure) noise, and not for environmental (distant community exposure) measurements; the effects of this error upon the indicated reading can vary among meters.</p> <p>It is noted that the modelled background sound from traffic at one of the rural receptors was only 18 dBA, as compared to a reported</p>		

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			<p>measurement on the order of 40 dBA, which was stated in the EIS as the effective noise background level.</p> <p>The Stillwater response to the original IR was deemed not to be satisfactory by the MOE noise reviewer. Detailed comments on the response have been appended to this Table, in Appendix 1.</p> <p>Rationale: The possible systemic error in the measurement of existing background noise at remote receptors in the baseline Noise Report, arising from equipment limitations and other measurement inaccuracies can lead to inappropriate noise criteria being established and predicted impacts being minimised.</p> <p>The discrepancy between the reported measured sound level and the modelled sound</p>		

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			level from road traffic is of particular concern, as it means that the effect of the project might be misstated by quoting overly high background levels.		
Surface Water					
3	Section 2.7.1 Approach to the Effects Prediction, Mitigation Measures and Significance of Residual Effects.	<p>Panel IRs 12.1.1 12.1.2</p> <p>Pg. 4.7, 5.3, 5.6. Receiving-Water Based Discharge Quality. Water Quality and COPC Fate Modelling Report #6</p> <p>Pg. 5.6. Paragraph 2. Water Quality in Hare Lake. Water Quality and COPC Fate</p>	The method used to assess the potential impact of the discharge to Hare Lake is not consistent with protocols outlined in this Ministry's "Deriving Receiving-Water Based, Point-Source effluent Requirements for Ontario Waters, July 1994". Specifically, the modeling exercise did not establish the boundaries of a mixing zone nor did it consider the effects of lake stratification on plume dispersion; the effects of a non-buoyant plume and final effluent mixing within the lake; lake retention time and its influence on contaminant retention/release downstream. The results of the modeling exercise are not used to evaluate the potential impact of effluent on lake	Additional information is needed to better understand the impact of the final mine effluent on the water quality of Hare Lake; Hare Creek and Port Munro. A revised modeling exercise should include consideration/rationalization of: the boundaries of a mixing zone; predicted concentrations of contaminants in the mixing zone; the effects of lake stratification and hydrology on plume dispersion; the effects of a non-buoyant plume and final effluent mixing within the lake; lake retention time and its influence on contaminant retention/release downstream. The results of the modeling exercise also	This information is needed to make decisions on the impacts to Hare Lake, Hare Creek and Port Munro. Therefore, this information is required to decide if there is sufficient information to proceed to the public hearing.

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
		Modelling Report #6	<p>trout hypolimnetic habitat or sensitive salmonid habitats downstream of the outflow of Hare Lake. The absence of these modeling elements precludes any decision making on the impacts on this sensitive waterbody.</p> <p>Final effluent criteria needs to be developed taking into consideration this Ministry's "Deriving Receiving-Water Based, Point-Source effluent Requirements for Ontario Waters, July 1994".</p> <p>Based on the proponent's response to Original IR's 12.1.1 and 12.1.2, work needed to complete the final modeling of effluent discharge to Hare Lake is ongoing. No further information was provided in the response regarding the definition of a mixing zone boundary or plume delineation. The proponent intends to complete the modeling exercise prior to provincial permitting.</p>	<p>need to consider the potential impact of effluent on lake trout hypolimnetic habitat or sensitive salmonid habitats downstream of the outflow of Hare Lake.</p> <p>The report did not clearly indicate the preferred effluent criteria proposed by the company (assumed to be those provided in Table 4-3) and how those are protective of the water quality in Hare Lake?</p>	

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			However, in order to assess potential impacts to Hare Lake during the EA, further information needs to be provided.		
EA-process					
4	Sections 2.2.1; 2.3.2, 2.4.2	Panel IR 4.1 Section 3 of EIS	<p>The EIS Guidelines state that the EA must include an evaluation of the environmental effects of alternatives to the Project, and discuss the advantages and disadvantages of each of the alternatives to.</p> <p>While the response to IR 1.1 discusses the need for the project and why the do nothing would not address that need, an assessment of the alternatives to, considering environmental, social and cultural, economic and technical costs and benefits of those 'alternatives to' was not conducted. It also doesn't explain to the reader the advantages of pursuing the mine versus focusing on recycling or developing other mines.</p>	The other alternatives considered for the project, such as at the other locations for PGM mines, or recycling, should be better explained, and a consideration of social, economic, and environmental factors should be included, as well as a discussion of advantage and disadvantages of these alternatives.	This information should be provided before the start of the hearings.

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			<p>Stillwater indicates previous work allowed them to limit the alternatives to, and that decisions were made before the project was subject to the Environmental Assessment Act in 2011. While proponents can rely on previous planning work to limit alternatives to a project in the EA process, this previous work needs to be included in the EA, to show how the decisions were made, and the decision-making process needs to contain key elements of the EA process, such as consideration of environmental impacts of various alternatives.</p> <p>Additionally, the do nothing needs to be considered for comparative assessment, to be used as a benchmark. This requirement can be found in the MOE's Codes of Practice for Preparing EAs, where it states that "the do nothing</p>		

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			alternative it is a benchmark against which the consequences of the alternatives can be measured in order to determine, amongst other things, the extent to which other alternatives address the problem or opportunity.”		
5	4.2.2	MOE-EA-11	See MOE comments for IR 4.2.3 for MOE response to this issue.	See MOE comments for IR 4.2.3 for MOE response to this issue.	
6	4.2.3	MOE-EA-10	While criteria are used (biophysical, technical, etc.) to assess the different alternative methods for different project components, and some of the points made about the impacts of the various alternatives are referenced to the supporting technical documents, there continues to be no quantifiable indicators used to make the decisions about preferred alternatives, and the decision to select an alternative for each factor as preferred versus acceptable remains very subjective.	Stillwater should provide a thorough assessment of alternative means, as required by the EIS Guidelines, particularly for the two components noted in the rationale.	This information should be provided in advance of the hearings.

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			<p>Regarding the road alternatives, the only rationale for eliminating a third possible road option from consideration was the length of the road; however, other factors may have provided it to be favourable for other reasons. As it is a technically viable option, Stillwater should have included it in its alternative assessment of road access options. If it was assessed to some degree and determined to be not technically or economically feasible, this information should be included in the response.</p> <p>Regarding electrical power supply, Stillwater did not include an assessment of viable alternatives methods for identifying power supply for the project. While the responses to IR 6.2 provided an evaluation of factors for diesel, no comparative analysis was conducted for the two alternatives. Without</p>		

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			this comparison, decisions about preferred alternative methods have been made without a complete discussion or assessment.		
7	5.4	MOE-EA-20	The response has not addressed the concern raised. As the proposed rail load-out facility in Marathon is adjacent to the AOC in Peninsula Harbour, there is a potential for impacts to the area. There is inadequate justification for concluding that there will be no impact to this area.	As there is the potential for concentrate losses at the load-out facility, Stillwater should provide justification for why it concluded that no impacts to the Harbour may occur, and should also consider the potential for accidental releases of concentrate into this area in this discussion.	This information should be provided in advance of the hearings.
8	8.1	MOE-EA-15	<p>The information provided in the IR response appears very subjective. For example, it isn't clear how certain VECs were considered to be high or what the justification was for excluding societal or ecological VECs with high impacts, which may be low or moderate for the other criteria. It also isn't clear why all of the criteria were not weighted equally.</p> <p>It is also not clear how the</p>	Stillwater should provide further clarity on how it determined a low, moderate, or high ranking for each criterion for each VEC and explain why it is appropriate that VECs that were ranked low for some criteria (extent, frequency, etc.) but high for societal and ecological criteria, were not carried forward for further assessment and therefore, significance of impacts or mitigation were not	This information should be provided in advance of the hearings.

Issue #	Reference to EIS Guidelines or Panel Terms of Reference	Reference to EIS and Original IR	Rationale	Information Request	Timeline for Response
			ranking for societal and ecological values was determined. The IR response states that these were based on input and feedback from various sources and experience – it does not provide for a transparent process to clearly understanding of how these values were ranked.	considered.	

Appendix 1: Additional information related to the Noise IRs

MOE’s additional comments related to Stillwater’s response to IR 5.3 (Stillwater text in italics followed by MOE’s responses)

- 1) *“At a maximum, up to four cars will be shunted per day with respect to either proposed rail loadout facility location...The rail car shunts are considered to produce single event impulse noise, based on Ontario Ministry of Environment (MOE) NPC 103 document measurement methodology for frequent impulses versus single events”.*

Current MOE practice regarding assessment of impulsive noise includes consideration of predictability, repetition and frequency of events. As the described events would happen multiple times on most days, it is not a given that these would be considered as single events.

- 2) *“Frequent impulses require measurements of 20 events within a continuous period of 20 minutes or up to 2 hours, providing that impulses occur in each of the four consecutive periods of five minutes each during the initial 20 minute measurement period.”*

This 1978 specification for measurement, while useful for ascertaining the levels of frequent events, is not currently the determining factor of the appropriate limit for compliance assessment purposes.

- 3) *“The MOE noise publication NPC 205 states that for impulsive sound, other than Quasi-Steady Impulsive Sound, from a stationary source which is not a blasting operation in a surface mine or quarry, characterized by infrequent impulses, the sound level limit is 100 dBAi at a point of reception.”*

A level of 100 dBAi (as in the 1997 NPC-205) represents a very significant impulse, similar to a single beat of a bass drum heard close by. MOE has proposed a new set of limits for this type of sound, which is a small part of a very extensive rewriting of noise guidelines in Ontario (Draft NPC-300) currently under consideration for approval (see Table B-3 and B-4 below):

Table B-3 Exclusion Limit Values for Impulsive Sound Level (LLM, dBAi) Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area (Urban)	Class 2 Area (Suburban)	Class 3 Area (Rural)
07:00 – 23:00	9 or more	50	50	45
	7 to 8	55	55	50
	5 to 6	60	60	55
	4	65	65	60
	3	70	70	65
	2	75	75	70
	1	80	80	75

Table B-4 Exclusion Limit Values for Impulsive Sound Level (LLM, dBAi) Plane of Window – Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00–23:00)/ (23:00–07:00)	Class 2 Area (07:00–23:00)/ (23:00–07:00)	Class 3 Area (07:00–19:00)/ (19:00–07:00)
9 or more	50/45	50/45	45/40
7 to 8	55/50	55/50	50/45
5 to 6	60/55	60/55	55/50
4	65/60	65/60	60/55
3	70/65	70/65	65/60
2	75/70	75/70	70/65
1	80/75	80/75	75/70

The applicable figures from these tables for the situation in Marathon are that, if there is no more than one impulse per any one hour, the maximum impulsive sound level (dBAi) at a Point of Reception would be 80 dBAi daytime, and 75 dBAi at night, considerably less than the 100 dBAi proposed by Stillwater, and more impulses per hour would lower that limit.

- 4) *“Using the +12 dB adjustment, the predicted impulsive sound pressure level of 90 dBAi does not exceed the MOE single event criterion of 100 dBAi.”*

As can be seen above, the proposed new MOE limits would be no more than 80 dBAi. Also to be considered, a June 2012 ruling of the Ontario Municipal Board on a very similar situation stated that the appropriate limit for the impulsive noise of railyard shunting was 50/45 dBAi (Day/night), as compared to the limit of 100 dBAi originally claimed as applicable by the proponent in that case. Depending on the degree of predictability and repetition of the impulse emissions, MOE might well consider the limit (and has in recent assessments) to be 50/45 dBAi (Day/night) or up to the level of average hourly background traffic noise; this would assess impulsive events with levels above this limit, such as those with levels between the 50/45 dBAi limit and the 100 dBAi limit as unacceptable.

MOE’s additional comments related to Stillwater’s response to IR 11.3 and 11.9 (Stillwater text in italics followed by MOE’s responses)

- 1) *“The Sound Level Meter has a usable range... of from 40 dBA to 100 dBA”*

This means by definition that it is not usable for the accurate measurement of sounds less than 40 dBA long-term, which is very often the case in deep rural areas away from busy sources of traffic, often with levels in the 20-35 dBA range (as has been measured in the past by this reviewer using meters intended for community/environmental noise, not occupational health and safety noise where the area of interest is above 80 dBA, as used by Stillwater’s consultant). In this case the EIS traffic modelling predicted a traffic background of 18 dBA, which likely represents a more accurate representation of background sound at that location than the 40+ dBA figure in the EIS.

- 2) *“due to microphone electrical noise, the noise floor of the instrument is 35 dBA and measurements must be at least 5 dB above the noise floor to be valid, the instruments used are considered to be accurate for sound levels of 40 dBA or greater”*

The operating manual for this instrument states that the noise floor is “approximately” 35 dBA, which means that the noise floor is not guaranteed to be no more than 35 dBA. In the experience of this reviewer, an electrical engineer with past experience in the use, calibration and repair of similar instruments, any number of permanent or temporary conditions such as a faulty electronic component, ambient temperature/humidity, or shipping/handling damage could cause long-term or short-term increases in instrument noise floor. Simply subtracting the assumed noise floor value from the indicated reading does not appropriately address this possibility.

- 3) *“There is no reason to believe that sound levels below 40 dBA occurred during the measurement period”*

On the contrary, if this location N3 is as remote as described, there are significant reasons to believe that sound levels below 40 dBA occurred. Unless there is a permanent, full-time noise source on site such as a waterfall, rapidly running water, a full-time generator, a transformer station or a pipeline compressor, the possible explanatory factors for levels over 40 dBA would include insect (crickets, locusts) or animal (birds, wolves) activity and weather conditions (wind, rain, hail), all of which would be transitory and thus should not be included in background ambient sound level determination. There was not supplied documentation accompanying the reported measurements which might clarify the question of credible sound sources on site. It is noted that the type of sound level meter that was used for the EIS measurements is, in contrast to those used by MOE, oriented toward use at much higher sound levels (80 dBA and above) than those expected in this environment, and, as such, would not normally be supplied with the large windscreens used in MOE measurements, leading to readings corrupted by excessive wind buffeting. If new measurements are made, it is recommended that a simultaneous audio recording be performed, so that the nature of any sounds with questionable levels can be ascertained.

- 4) *“The sound level measurement N3 during the assessment period of 48 hours did not dip below 41.9 dBA.”*

To lend perspective to this figure, it would not be surprising for this figure to be seen for properly made sound level measurements during overnight hours due to “urban hum” in many neighbourhoods in the City of Toronto. This figure is far above what would be expected from a location approximately 2.5km from Highway 17.

- 5) *“Stillwater could simply remove the 41.9 dBA criterion and rely on the MOE exclusionary night time noise criterion of 40 dBA for a wilderness (Class 3) area. This would meet MOE standards and industry practice in Ontario. Reducing the night time criterion does not significantly influence the results of the noise impact assessment.”*

In the spirit of EIS Guideline 2.7.2.2, this issue in this Environmental Assessment process is not one of approval, but rather to predict the effect of the proposed project upon the existing conditions in the area. If the measurable background ambient sound in a receptor area is 25 dBA or 30 dBA or 35 dBA, that is what is expected to be reported in the EIS, which is asking for a statement of actual baseline conditions, rather than a restatement of applicable criteria for approval.

Regarding IRs 11.3 and 11.9: in the end, what would be appropriate in the EIS for the baseline ambient noise figures for the named Points of Reception N1-N5 would be re-measurement under an MOE-approved and highly documented workplan, or, if this is not feasible, to substitute the predicted sound levels based upon the traffic modelling (which was extensively documented in SID 13). Unless the measurements reported in the 2012 EIS have been confirmed, references in the EIS to the raising of noise limits based upon baseline sound measurements should be removed from the EIS.