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December 4, 2013

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

Dear Mr. Pearson:

Thank you for your letter dated November 19, 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 Supplemental Information Requests (SIR) issued by the Panel on August 30, 2013 for the Marathon Platinum Group Metals-Copper Mine Project.

MOE staff have completed a review of the SIR responses as it relates to MOE's mandate, and have provided comments about whether the responses sufficiently address the SIRs that were issued by the Panel, including the technical merit of the information provided in the response to the SIRs.

MOE's comments on the responses, as well as requests for further information, can be found in the attached Table 1. MOE is requesting that the additional information be provided to the MOE prior to the hearing, to allow the MOE to have the necessary information to submit and present its conclusion about the project at the hearing.

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>

Ian Parrott
Director (A)
Environmental Approvals Branch

Attachments:
Table 1 – MOE sufficiency review and additional information requests

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

Table 1 – MOE sufficiency review and additional information requests

Supplemental Information Request	Panel SIR	MOE Comments	MOE Additional Information Request
Noise			
SIR #1 Assessment of Alternative Rail Load-out Locations and Rail Shunting Noise Criteria	Describe the five alternative rail load-out locations presented in the response to IR 5.1. Provide details of the assessment of these alternatives and compare with the two rail load out locations in Marathon. Provide an update on the preferred rail load out location based on the assessment of alternatives. Include an assessment of the impulsive sound emission levels from rail shunting operations at the rail load out locations under consideration against the Ministry of the Environment proposed limits for impulsive sound found in Draft NPC-300 of 80 dBAi daytime and 75 dBAi night time. Note that for more than one impulse per hour, lower limits may apply. If, through this new assessment, SCI determines that the Ministry of the Environment draft limits for impulsive sound are exceeded, explain how effects from shunting would be mitigated.	It should be noted that "Draft NPC-300" has since been approved, and is now the MOE guideline in effect for this issue.	MOE has no concerns about SIR#1 at this time.
SIR #2 Measuring Baseline Noise Levels	Re-measure the baseline ambient noise for Points of Reception N1 to N5 using equipment and methodologies acceptable to the Ministry of the Environment, or if it is not feasible to re-measure these Points of	The main intended purpose of this document, new measurements and reporting of baseline background sound levels at receptors to replace the figures in the original EA, appears to have been	MOE has one outstanding concern related to SIR #2. MOE requests that the proponent provide information

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	Reception, the predicted background levels of 18 dBA generated by the traffic modelling should be used for Points of Reception N1 to N5 rather than 40 dBA. Use these new baseline levels to re-assess the significance of noise impacts from the Project.	achieved successfully. There is one issue of concern. The quoted paragraph below states that there has been a new modelling of operational sound from the Project since SID#17, from page 4: "TGCL evaluated noise impacts from the Project in 2012, and the results were reported in SID#17. Subsequent to the publishing of SID#17, minor modifications to the mine configuration, such as expansion of the Process Solids Management Facility (PSMF) footprint to the west and south, were made. Noise impacts from these changes were re-modelled consistent with the methodology documented in SID#17. All references in this SIR response to noise impacts are based on the updated and current mine plan details, as documented in various IR and SIR responses." While SIR#2 reports the new predicted sound levels from facility operations at the important receptors (in the text and in Table 2), and discusses the implications of these sound levels in an appropriate manner, it does not state how various parameters were changed in the modelling, nor are sample calculations provided.	concerning new noise modelling details, in advance of the hearing.

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		So, while the new noise impacts may be "based on updated and current mine plan details, as documented in various IR and SIR responses", there does not appear to be any discussion available as to which "details" or other modelling changes might have occurred. While the sound levels in SIR#2 are higher than in SID#17 by from 1 to 8 dB, and thus appear more conservative, the lack of a stated basis for the new numbers is of some concern. It is conceivable that the reported impacts should have been even more conservative. MOE cannot comment on the validity of these new predictions in the absence of a description of the new SIR#2 noise modelling process.	
Surface Water			
SIR #5 Impacts of PSMF Discharge to Hare Lake	1. Provide a comprehensive summary of baseline conditions and function for Hare Lake pulling together data and information collected as part of the EIS and additional data and information collected in 2013 as described in the response to IR 12.1.1. This should include the following information: a. hydrologic regime, quantity and quality of water to the lake including seasonal variation;	The description of baseline conditions is adequate for the purposes of EA. The results of the modeling undertaken by EcoMetrix were included in the response to SIR#5 and firmly concluded that there will be "no impact" to Hare Lake based on multiple criteria (i.e. phytoplankton, zooplankton, sediment quality, benthic community structure, water quality beyond a 50m	The response to SIR #5 has not sufficiently addressed the SIR. MOE requests that the proponent provide the CORMIX input data and a sensitivity analysis that identifies the assumptions and numeric inputs that influence modelled predictions, in advance of the

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	b. chemical and nutrient influx to the lake; c. seasonal temperature profile of the lake and delineation of the lake thermal profile; d. primary productivity, including phytoplankton and zooplankton population diversity and structure; e. diversity and density of benthic invertebrate populations; f. identification of key indicator species; g. identification of fish species and their population dynamics (e.g. age structure); h. metal levels in fish tissue; and i. structure of the food chain, i.e. the energy pyramid If information is not currently available, provide a study plan and timelines to obtain the information. 2. Provide a report that predicts and describes the impacts of the effluent from the PSMF on the aquatic ecosystem of Hare Lake and Hare Creek. This should include new modelling that incorporates the latest data collected and also a consideration/ rationalization of: • any new estimates of COPC from the PSMF – see SIR 4; • modelled temperature of discharge from PSMF addressing Ministry of Natural Resources concerns related to IR response 12.6.1;	mixing zone, fish body burdens and community structure). To better understand how this conclusion was derived and to verify the accuracy of this prediction, the MOE requests that EcoMetrix provide the CORMIX input data and a sensitivity analysis that identifies the assumptions and numeric inputs that influence modelled predictions. This information is needed to evaluate the adequacy of the inputs and the corresponding outputs, and to make decisions on the impacts of the PSMF discharge to Hare Lake. The MOE needs to understand the possible range of these impacts (i.e. was the worst-case or best-case scenario modelled?). Should the EA be accepted and the project move towards permitting, effluent limits will need to be developed that are consistent with the company's current modelling effort that ensures the protection of water quality and biological integrity of Hare Lake over the duration of the proposed mine's life.	hearing. MOE also requests that the proponent commit to incorporating these conservative effluent criteria into future permitting.

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	• the proposed location of the diffuser; and • updated hydrologic data for the Hare Creek watershed mentioned in the response to IR12.2.2. The report is to include modelling results to predict: • 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; and • lake retention time and its influence on contaminant retention/release downstream. 3. Using the results of the modelling exercise the report should present an evaluation of the potential impacts to the following: • primary productivity and effects on food chain; • phytoplankton and zooplankton species diversity and abundance; • fish communities in Hare Lake and Hare Creek, such as lake trout hypolimnetic habitat and salmonid habitat downstream of the outflow of Hare Lake; • bioaccumulation of metals or other contaminants; • changes to hydrologic regime (increase or reduction of flow annual variations);		

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	• variation to the thermal regime of the lake; • chemical and physical composition of effluent discharge to the Lake (quantity over length of project); • overview of deposition on the sediment for the duration of the project; impacts on the sediment from effluent deposition. Information should be provided on the potential impacts on the annual nutrient transfer to the lake during the spring and fall turnover; and • assess possible impacts on benthic species and provide an overview of the impacts on the existing food chain. If impacts are identified, the analysis report should also identify mitigation measures that would be undertaken to minimize impacts on the biological functions of Hare Lake and Hare Creek. Identify the criteria that are used to make this judgement, and contingency measures that could be undertaken if such mitigation is not effective. For the mitigation proposed in the event of a meromictic condition in Hare Lake, i.e. artificial mixing of the lake, provide a description of the effects of the mitigation, including any changes to Hare Creek.		
SIR #4	1. Provide the methodology used to obtain	The response to this SIR impacts on previous	The response to SIR #4 has not

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COPC Loading Rates and Water Quality	the specific and total surface areas for various particle size fractions of the humidity cell test samples given in Table 9.8-1 and for the modeled waste rock particle size distribution given in Table 9.8-2. 2. Provide an explanation for the reported differences between the respective values of specific and total surface areas given as 1,179,260 m2/tonne and 15,3330 m2 in Table 9.8-1 and the corresponding 31,059 m2/tonne and 331 m2 in Table 9.8-2 for the very fine, silt and clay size fractions of diameter 0.001 mm. 3. Consider and respond to Natural Resources Canada's opinion regarding the need to: a) Remove the additional correction factor of 0.01 pertaining to the very fine particle size fractions applied to obtain the field COPC mass loading of waste rock in the MRSA; b) Recalculate waste rock COPC loads by multiplying by an additional factor of 2 to account for the difference in the temperature correction factor of 0.17 in EcoMetrix (2010) and the MEND (2006)	MOE comments on IR's 9.10.1 and 24.15. The previous comments indicated that assessment of these IR responses is dependent on the accuracy of the source concentration predictions, which NRCan has expressed concerns over (IR's 9.3.3, 9.4.1 & 9.8). It was indicated that a decision on the acceptability of the above IR responses would be deferred until NRCan's concerns had been satisfactorily addressed. Based on consultation with NRCan, there may still be considerable uncertainty in the short and long term water quality predictions for both the PSMF and the MRSA. Therefore, the predicted impacts on surface water features could possibly be underestimated for leachate and effluent discharge on surface water features. As it not clear if supplementary humidity cell tests will be required prior to the panel hearing to address the unknown margin of error, there still remains uncertainty in COPC loading predictions and the unknown potential impacts to water quality. This uncertainty affects decisions on the potential for impact resulting from uncollected/untreated seepage but also has implications as to the degree of treatment needed for the final TMA effluent and the potential for the byproducts of effluent	sufficiently addressed the SIR. MOE requests that contingencies (including consideration of worst-case scenarios and potential mitigation measures) are provided to address potential impacts to surface water features, in advance of the hearing.

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	recommended value of 0.31; and c) Apply the temperature correction factor of 2 to type 1 and 2 process solids drainage water quality predictions. 4. Recalculate COPC loads as suggested by Natural Resources Canada. Using these new estimates, assess the impact on the water quality of MRSA and process solids management facility (PSMF) drainages, the receiving basins and ultimately that of Hare Lake / Creek and Pic River.	treatment (i.e. TDS) to impact on water quality and mixing of Hare Lake. Given the uncertainty in COPC loading predictions and the unknown potential impacts to water quality, contingencies (including consideration of worst-case scenarios and potential mitigation measures) are needed to address potential impacts to surface water features. Although MOE will require a monitoring program and contingency plan in the provincial Environmental Compliance Approval for the site, should the EA be approved, these contingencies need to be identified for the purposes of the EA.	
Groundwater			
SIR #4 COPC Loading Rates and Water Quality	1. Provide the methodology used to obtain the specific and total surface areas for various particle size fractions of the humidity cell test samples given in Table 9.8-1 and for the modeled waste rock particle size distribution given in Table 9.8-2. 2. Provide an explanation for the reported differences between the respective values of specific and total surface areas given as 1,179,260 m2/tonne and 15,3330 m2 in Table 9.8-1 and the corresponding 31,059 m2/tonne and 331 m2 in Table 9.8-2 for the very fine, silt and clay size fractions of diameter 0.001 mm.	• The response to this SIR impacts on previous MOE comments on IR's 9.7, 9.9, 24.15, & 24.17. The previous comments on these IR responses indicated that MOE may have to revise the opinions should NRCan's concerns prove true, which would result in COPC loading rates being considerably higher than those presented in the proponents initial response. • Based on the previous comments provided by NRCan on IR 9.8, the proponent has carried out adjustments to the calculations for the COPC loading	The response to SIR #4 has not sufficiently addressed the SIR. MOE requests that the proponent clarify how the changes to the COPC loads affect stream 1, 5 and 6 water sheds, and provide revised loading rates and impact assessments, as required. MOE is also requesting that the proponent consolidate and clarify the contingency

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	3. Consider and respond to Natural Resources Canada's opinion regarding the need to: a) Remove the additional correction factor of 0.01 pertaining to the very fine particle size fractions applied to obtain the field COPC mass loading of waste rock in the MRSA; b) Recalculate waste rock COPC loads by multiplying by an additional factor of 2 to account for the difference in the temperature correction factor of 0.17 in EcoMetrix (2010) and the MEND (2006) recommended value of 0.31; and c) Apply the temperature correction factor of 2 to type 1 and 2 process solids drainage water quality predictions. 4. Recalculate COPC loads as suggested by Natural Resources Canada. Using these new estimates, assess the impact on the water quality of MRSA and process solids management facility (PSMF) drainages, the receiving basins and ultimately that of Hare Lake / Creek and Pic River.	rates from the MRSA in groundwater discharging to the Pic River. As a result of the adjustments to the loading rates, COPC discharges to the Pic River from groundwater seepage will increase by 5 to 6 times over the original predictions. However, due to groundwater recharge representing only a small fraction of the flow in the Pic River, the newly calculated COPC discharges in groundwater seepage will result in no net change in the COPC concentrations in the Pic River over the current background concentrations. • The proponent has provided no updated values for COPC discharges from the PSMF to the Stream 5, Stream 6 and Stream 1 watersheds. It is unclear whether this is because the adjustments do not apply to the PSMF, or if this has been overlooked. The flows in these streams are considerably lower than in the Pic River, and consequently groundwater recharge to the streams may represent a more significant contribution than in the Pic River. For sufficiency, the proponent needs to clarify how the changes to the COPC loads affect these three water sheds, and provide revised loading rates and impact assessments as required.	measures that could/would be implemented to address groundwater impacts beyond those predicted (i.e. if NRCan's worst case is true). As part of this, the proponent should identify the appropriate contingency concepts that could be used to manage the possible changes in COPC loads.

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		• Based on discussions with NRCan, it is understood that NRCan have reviewed the changes to these calculations, and that their conclusion is that there is still considerable uncertainty in the accuracy of the loading calculations pertaining to the conversions required to account for the fine particle size fractions However, it is further understood that NRCan will not be requiring any further revisions for sufficiency of the EA, and will instead be recommending that the proponent should be carrying out in-situ testing during early operation of the mine as a follow up to the EA. It is NRCan's opinion that the proposed mitigation measures can be revised to address the uncertainty. • Based on the information that is presented by Stillwater, along with consultation the MOE has had with NRCan, there may still be considerable uncertainty in the estimates of leachate impact from both the PSMF and the MRSA on surface water features (Pic River & Streams 1, 5 & 6). Although it is understood that there will be a monitoring program and a contingency plan that could address these uncertainties, for the purposes of EA, the	

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		proponent needs to consolidate and clarify the contingency measures that could/would be implemented to address groundwater impacts beyond those predicted (i.e. if NRCan's worst case is true). • Should the EA be approved, MOE will require that the monitoring program and contingency plan be detailed as conditions of operational approvals and permitting for the site. However, for purposes of the EA, the proponent should be identifying the appropriate contingency concepts that could be used to manage the possible changes in COPC loads.	
SIR#6 Groundwater Recharge, Retention & the Effects of Climate Change	Groundwater Recharge • Explain the rationale for the recharge rate used in the numerical groundwater model. • Recalculate the annual recharge value and demonstrate to what extent the new value affects the numerical groundwater model through the operations, closure and post-closure phases of the project. • Clarify whether and how the estimation	• The responses are satisfactory for the purposes of the EA. In particular, the recharge (infiltration) rate of 79mm/yr used by the consultant is an appropriately conservative estimate for Northwestern Ontario, in line with values typically applied in landfill design in this area. • With respect for the potential for moisture deficits in periods of extreme drought, suitable monitoring and contingencies have been identified, and the MOE would encompass these measures as conditions of the	MOE has no concerns about SIR#6 at this time.

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	of recharge can be improved beyond correcting the error. In this regard, note that the Golder (2007) report suggests that a more accurate measure of the groundwater recharge to the study area would require a hydrological assessment in determining base flows from main watersheds in the area during periods of low precipitation. *Effects of Climate Change on the Design of the PSMF* • With respect to current climate change modelling undertaken by SCI to date, explain the implicit assumption that monthly precipitation values are independent as opposed to assuming month to month persistence. • Demonstrate through the application of new modelling - and assuming future multi-year drought scenarios and month to month persistence – the potential effects of increases in temperature and evaporation through climate change on the maintenance of moist conditions of type 2 process solids within the PSMF, post closure. • Demonstrate whether groundwater recharge and retention are the key	Environmental Compliance Approval for the site, should the EA be approved.	

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	factors in maintaining moist conditions of the Type 2 process solids within the PSMF, even under multi-year drought scenarios post closure. • Identify the contingency plans in the event groundwater levels are not maintained in the PSMF as planned.		
SIR#10 Human Health Risk Assessment (HHRA)	The Panel understands that SCI is in the process of completing a human health risk assessment and will be in consultation with Health Canada in this regard. The Panel requests that SCI provide the Panel with their assessment on impacts to human health.	In discussion of the use of groundwater as a potable resource, the HHRA makes no clear reference to groundwater users outside of the mine site or the municipally serviced area of Marathon. However, there is development along the Hwy 17 corridor that uses groundwater as a potable source. Furthermore, there are 2 cottages located on Hare Lake – although there is no indication that these cottages currently use groundwater, there are no restrictions identified which would prevent this use in the future. The cottages on Hare Lake are a significant concern as there is a component of groundwater seepage from the PSMF that is directed towards the Hare Lake watershed. For sufficiency of the EA, the HHRA needs to provide a clear discussion of the potential development of groundwater resources in the area near their site, and the impact on the HHRA.	The MOE has an outstanding concern on SIR #10 as it relates to groundwater. The HHRA needs to provide a clear discussion of the potential development of groundwater resources in the area near their site, and the impact on the HHRA.