



COMMENT LOG

Document Title: Mount Nansen Site Characterization Report

Document Date: Draft - November 15, 2013 Rev 0 Final – March 20, 2014

AMEC File No. VM00605E

Comments By: MNRP Project Partners - AAM, AANDC, LSCFN

Responses By: AMEC Design Team – Paul Morton, Les Hardy, Judy Andrina, Nicole Jacques, George DeRidder, Renata Wood, Charles Masala, Brian Geddes

Response Date: March 20, 2014, April 2, 2014

Page Number, Name and Date	Comment (on Draft)	Status or AMEC/AE Response (March 21, 2014)	AAM Response (on 20 March 2014 Draft Final)	AMEC/AE Response (April 2, 2014)
Technical Comments				
	*Please ensure that where data is provided related to sampling of contaminant that the guidelines are presented as a column and that the exceedances are identified for all (sediment, soil sampling, water sample, etc.) in order to ensure that no exceedances are missed, this should also be provided in the data report.	<p>This has been done with two exceptions as discussed with AAM.</p> <p>In Appendix D, the tables compare the results of different sampling methods. In this case, the comparison is between sample results, not to standards to backup conclusions made in the report. This data is presented elsewhere in comparison to standards.</p> <p>Table 36 presents the leachate test. These are not typically compared to standards.</p>		



Page Number, Name and Date	Comment (on Draft)	Status or AMEC/AE Response (March 21, 2014)	AAM Response (on 20 March 2014 Draft Final)	AMEC/AE Response (April 2, 2014)
Page 1: Comment [J2] Josee.Perron 03/02/2014 3:42:00 PM	What about the reconstruction of the Dome Creek Valley following the removal of the TSF? Is it included in the last bullet, should we mentioned it as a separate item?	Added specific reference to Dome Creek in the last bullet.		
Page 3: Comment [W3] Wade.McMillan 24/01/2014 12:59:00 PM	Please comment in what way...providing a conduit, or barrier? Or reference further explanation in another location	Section updated to reflect updated text later in report.		
Page 4: Comment [J4] Josee.Perron 03/02/2014 3:44:00 PM	What about the road throughout the site that were build out of waste rock, the adit, and the tailings ponds by the mill, are they not also key components?	Added these items in with an extra note about the adit because it wasn't sampled for solid samples since it isn't accessible.		
Page 4: Comment [W5] Wade.McMillan 23/01/2014 12:11:00 PM	Were Sulphate and Sulphide intended to be followed by bracketed (S) or Sulphide (SO ₃)-2, etc?	Added the chemical formula (also in Section 7).		
Page 7: Comment [J7] Josee.Perron 03/02/2014 4:16:00 PM	What do you mean by this, the water level has always been kept under the operating level? Water level fluctuates between 1095.84 to 1096.17 masl and the maximum operating level is 1097.8 masl (see bi- annual dam inspection report completed by EBA).	Clarified, water level in the tailings deposit is high (i.e. at ground surface and not a perched water level); this wasn't intended to be a comment about pond levels.		
Page 8: Comment [J8] Josee.Perron 03/02/2014 4:17:00 PM	Can you specify what kind of assessment and when should it be completed?	Added test to address this.	Please note that this section was not modified. Can you please provide confirmation of the location where this was added? We were unable to locate it.	It has been corrected. There were changes by multiple authors in this section and this edit got missed - sorry.



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Page 8: Comment [J9] Josee.Perron 03/02/2014 16:17	Please note that there are 2 portals.	Added this to text.		
Page 8: Comment [J10] Josee.Perron 03/02/2014 16:18	Pond 1, 2 or 3?	Addressed, removed and noted distance and direction from Mil Bldg.		
Page 9: Comment [J11] Josee.Perron 03/02/2014 16:20	Can you please describe? Not on SC-2, SC-2 shows pictures.	Location noted by Borehole #.	Please note that this comment has not been addressed, reference to figure is wrong, Figure 20 shows pictures of the mill complex.	The text was changed to provide the location of the reference to the borehole location BH-M-13-04. The figure reference update was not done correctly and has been fixed to reference Figure 45 which shows that borehole. (This also addresses the comment in the pdf on page 18).
Page 9: Comment [W12] Wade.McMillan 23/01/2014 3:38:00 PM	"Does not appear" Assumption based on soil sample testing, core sample, surface geology, concrete barrier, etc., observation?	Description of location and boreholes specified in text.		
Page 11: Comment [CJD13] Chris Dixon 15/01/2014 12:28:00 PM	I haven't seen the closure objectives stated in this way in any other documents prior to this series of documents from AMEC and generally AANDC doesn't agree with the way this is worded. There are five main closure objectives and none of them state (even in the detailed sections)	Updated per final DBM document.		



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	<p>“original form” or “natural appearance”. AANDC agrees with “Return the Mine Site to an acceptable state that reflects original use, where possible.” But to say the objective is to remediate to original form and a natural appearance would require a more in-depth discussion.</p>			
<p>Page 14: Comment [J14] Josee.Perron 03/02/2014 4:23:00 PM</p>	<p>What about the reconstruction of the Dome Creek valley following the removal of the TSF?</p>	<p>Added specific reference to Dome Creek in the last bullet.</p>		
<p>Page 15: Comment [W15] Wade.McMillan 03/02/2014 4:23:00 PM</p>	<p>Please review comments from MN SI report, changes were not made as previously suggested. Whatever you decide, please stay consistent.</p>	<p>Corrected to match final SI data report.</p>		
<p>Page 16: Comment [W16] Wade.McMillan 24/01/2014 1:03:00 PM</p>	<p>Original comment in MN SI draft report: Should verify the number, 14 mini, 5 singles and 8 new monitoring wells = 27? Is it because some were not sampled?</p>	<p>Revised text to itemize the groundwater locations sampled, as follows:</p> <p>29 existing (pre-2013) groundwater mini-piezometer and well sample locations.</p> <p>17 new (2013) groundwater mini-piezometer sample locations.</p> <p>Three new (2013) groundwater wells (in corehole) sample locations.</p>	<p>Same comments as SI data and memo, please verify info. I thought we have 19 mini piezometers (14 doubles and 5 single), 7 new groundwater wells around the pit, and 3 pipes on tailings? The answer provided does not seem to be reflective of the actual install and is different than the one in the SI data.</p>	<p>This has been made consistent with the data report and the groundwater results presented.</p>



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Page 16: Comment [W17] Wade.McMillan 24/01/2014 1:22:00 PM	Please confirm this value, it shouldn't be approximate, it's a sample count, if unable to verify please give a range.	Updated value consistent with data report.		
Page 35: Comment [J20] Josee.Perron 03/02/2014 16:34	Can you please provide the unit in brackets (m ³ /s?)	Done.		
Page 35: Comment [J21] Josee.Perron 03/02/2014 4:35:00 PM	See the latest dam safety review from Worley Parsons for flow.	Done.	Please note that the sentence provided does not necessarily provide clarity. Similar to EBA? Do you mean similar to the above mentioned revised flow by BKH who was subcontracted by EBA?	Have clarified this to say that "the peak flow results were similar to those predicted by BKH and subsequently adopted by EBA (2002)."
Page 40: Comment [J22] Josee.Perron 03/02/2014 4:36:00 PM	Available and has been uploaded on a quarterly basis on the SharePoint site.	Text has been updated. This data wasn't available when the analysis was done but will not impact the design.	Text has not been modified, can you please review?	Updated – sorry problems with multiple edits again.
Page 45: Comment [J23] Josee.Perron 03/02/2014 4:43:00 PM	The information has been provided as part of the database from EDI, if you cannot find it, please let us know or call Adrienne.	The hourly hydrograph data is only provided in the data base for 2011 and for April to Sept 2013 (and this later was not available when the analysis was done). There are hourly water levels but to convert that to a hydrograph requires a rating curve. This has been done by EDI and is available in a hard copy		



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		graphical form. This is not expected to impact the design though.		
<p>Page 48: Comment [CJD25] Chris Dixon 22/01/2014 9:23:00 AM</p>	<p>Is this truly a conservative assumption from the point of view of putting tailings in the pit? If the pit lake is a perched water feature then it may respond slowly to additional inflows (e.g. tailings porewater, infiltration, etc.) which could cause the water elevation to rise within the waste/rock and tailings.</p>	<p>The Open Pit pond behaves as a surface water retention feature, with fully saturated hydraulic connection to deep groundwater.</p> <p>Water leaves the pit pond, as groundwater, at an average rate of 0.3 L/s, all year, within the annual pond elevation range (1,181 m to 1,184 m).</p> <p>The rock mass underlying the Open Pit pond has a piezometric elevation range from 1,166 m to 1,181 m (to be refined in 2014). Pond elevations greater than this range are currently controlled by surface water inputs and a small input from Pony Creek.</p>		
<p>Page 49: Comment [CJD26] Chris Dixon 22/01/2014 9:25:00 AM</p>	<p>Does this modify assumption 7 from the previous list?</p>	<p>Assumption 7 replaced by conclusion that the Open Pit pond behaves as a surface water retention feature, with saturated hydraulic connection to deep groundwater. The pond level is predominantly</p>		



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		<p>controlled by surface water inputs rather than groundwater.</p> <p>Water leaves the pit pond, as groundwater, at an average rate of 0.3 L/s, all year, applicable to a pond elevation range between 1,181 m and 1,184 m.</p>		
<p>Page 49: Comment [CJD27] Chris Dixon 22/01/2014 9:25:00 AM</p>	<p>Is this true because the adit will work as a drain or for some other reason?</p>	<p>The rock mass underlying the Open Pit pond has a piezometric elevation range from 1,166 m to 1,181 m (to be refined in 2014). Pond elevations greater than this range are controlled by surface water inputs and a small input from Pony Creek.</p> <p>If surface water and the Pony Creek water inputs are prevented from accumulating in the Open Pit, the long-term pond elevation will not rise above the Pony Creek Adit.</p> <p>Note: above comments are contingent on appropriate management of disposed tailings drainage water, plus an evaluation of deep groundwater changes</p>		



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		arising from long-term (2050) permafrost degradation.		
Page 50: Comment [CJD28] Chris Dixon 22/01/2014 9:29:00 AM	Why not? Could not get a seal? Explanation required.	Packer testing was not possible in highly weathered and weaker rock portions of coreholes as the packer required competent and intact rock for a sufficient water pressure seal.		
Page 50: Comment [CJD29] Chris Dixon 23/01/2014 3:31:00 PM	Using a decimal in an exponent is a strange way of reporting hydraulic conductivity to me. I would expect to see something similar to the way it is reported below with an integer in the exponent and a number other than 1 out in front if necessary. I understand that you are trying to show the log10 values, but it still seems like a confusing method.	Hydraulic conductivity results summary has been revised to more conventional scientific notation.		
Page 59: Comment [J30] Josee.Perron 04/02/2014 8:31:00 AM	What do you mean by this sentence, why would it not be available, do you mean reading of the existing piezometer or additional piezometer should be installed?	Three data loggers (installed November 2013), connected to single vibrating wire piezometers have only given limited, pre-equilibrium data. They need to be downloaded and analyzed in 2014.		
Page 59: Comment [J31] Josee.Perron 03/02/2014 4:49:00 PM	What does this mean, what is the impact on the project?	Preferential groundwater pathways from the Open Pit pond south and discharging into Dome Creek cannot be ruled out.		



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<p>Page 59: Comment [J32] Josee.Perron 03/02/2014 4:49:00 PM</p>	<p>Should this be captured this season?</p>	<p>A review of the hydrometric flow and level data for upper Pony Creek may help quantify creek water assumed to be entering the Open Pit north wall.</p>		
<p>Page 61: Comment [CJD33] Chris Dixon 22/01/2014 10:00:00 AM</p>	<p>It isn't clear to me what value is currently being used and how it was developed.</p>	<p>Text has been revised to join the two methods for quantifying water leaving the Open Pit as groundwater.</p> <p>The climatic water balance method gave an average outflow of 0.2 L/s. This did not account for Pony Creek water entering the Open Pit via the north wall, possibly biasing the inflow side of the equation and reducing the outflow. The wintertime recession curve method (not subject to Pony Creek biasing), gave an average outflow of 0.45 L/s based on three wintertime recession curves (2010 to 2013, incl.).</p>		
<p>Page 61: Comment [CJD34] Chris Dixon 22/01/2014 10:03:00 AM</p>	<p>I am also confused by this statement. Is it a perched water feature (i.e. not connected to the regional deep groundwater table) or is a reflection of the deep groundwater table (i.e. is connected to the regional deep groundwater table).</p>	<p>See response to Page 48: Comment [CJD25].</p>		



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<p>Page 61: Comment [CJD35] Chris Dixon 22/01/2014 10:04:00 AM</p>	<p>What about downstream in the seepage collection pond area?</p>	<p>Permafrost terrain mapping indicates that, from its uppermost reaches to slightly below the tailings facility and seepage collection pond, the Dome Creek floodplain has relict permafrost or is free of permafrost (District 10).</p> <p>Permafrost is present in the flat area of lower Dome Creek (District 8).</p>		
<p>Page 62: Comment [CJD36] Chris Dixon 23/01/2014 1:12:00 PM</p>	<p>Are kinetic tests underway to further expand on the data collected from the static SFE tests? It appears there is enough concern from the SFE to warrant kinetic tests like humidity cell testing and I would expect the YESAA process to request this work be done.</p>	<p>Considering the Mount Nansen project timeline, the kinetic testing (such as humidity cells) was not set up on the recent samples. The humidity cell testing usually has to run for at least six months and we can only select samples for humidity cell testing after having received and evaluated the ABA test results. In most cases, the humidity cell test duration needs to be extended beyond six months since the steady state rate is not always achieved within the first six months.</p> <p>The kinetic testing may be considered to run in the next phase of the project.</p>		



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Page 62: Comment [J37] Josee.Perron 06/02/2014 11:22:00 AM	What are the results? Is the absence of discussion indicating the results are not available yet?	The SFE results are available and discussed each section, e.g. waste rock, mill area, etc.		
Page 63: Comment [CJD38] Chris Dixon 23/01/2014 3:33:00 PM	There should be no comparison to MMER; MMER is for operating mines only and not to be considered during closure or post closure. Discussion should be around what effect this may have on Victoria creek and comparing the predicted Victoria Creek WQ with CCME.	MMER has been removed from all the discussion sections. Added discussion on the SFE testing results to identify the metal parameters that could be leached and contribute the loadings to the surface water quality.		
Page 64: Comment [W39] Wade.McMillan 04/02/2014 10:10	No Information provided	Corrected, this was the legend and shouldn't contain any information; the borders have been fixed.		
Page 68: Comment [W40] Wade.McMillan 04/02/2014 10:12	Is "Seep" the proper name of a place or more generally, there are numerous seep locations, if so, lower case or specify a specific location for this particular seep, i.e. seepage pond.	Yes it is. It is the H/WQ-Seep location in the water sampling program.		
Page 71: Comment [CJD41] Chris Dixon 22/01/2014 10:17:00 AM	These regulations are for operating mines only and will not likely be applied to this project.	The comparison to MMER is for reference only, it is not proposed as criteria. It has been mentioned, however, that MMER may apply during construction. In any case, the standard has been moved down to last on the list.		



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Page 80: Comment [W44] Wade.McMillan 06/02/2014 11:29:00 AM	Components of the mill were constructed at different times, please correct. The mill was upgraded in 1998 but was existing prior to 1998.	Reworded to say last upgraded in 1998.		
Page 81: Comment [W45] Wade.McMillan 06/02/2014 11:30:00 AM	Although the dismantled components may be 80% diverted, has the remote location and cost of transporting the usable waste stream to smelter/resale/crusher facilities been accounted for in the estimate? Is it practical to consider this option?	The 80% figure should be reassessed during the next phase of design. The impact on the design will be negligible because there is room in the pit for this material. The text has been updated to reflect this and this uncertainty will be included in the design report.		
Page 86: Comment [W46] Wade.McMillan 06/02/2014 11:32	Lead paint (?), what does this mean?	Deleted - was a left over as a reminder to confirm the paint on the tank.		
Page 86: Comment [J47] Josee.Perron 06/02/2014 11:35	<p>Possible lead paints on the containers? These were purchased recently; I doubt that they have lead paint. Is this making reference to the seacan hosting the current generators?</p> <p>There is several comments about lead paint, how will it be confirm? EBA did several testing related to lead paint, it should be reviewed. Where there is uncertainty related to hazardous material (including lead base paint), samples should have been taken, was it completed? If not, what is the plan?</p>	Deleted - was a left over as a reminder to confirm the issue.		



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Page 87: Comment [W48] Wade.McMillan 06/02/2014 11:36:00 AM	Road bridge, is this referring to the Dome Creek diversion channel bridge, in addition, please note that SC-4 is not showing the right location.	Yes this should be the bridge over the ditch. The text and figure have been updated. The Dome Creek culvert crossing has been mentioned only to say we aren't touching it because it is on the public road.		
Page 90: Comment [W49] Wade.McMillan 04/02/2014 11:30	This is the Camp Shed.	Corrected.		
Page 91: Comment [W50] Wade.McMillan 04/02/2014 11:33	Please include plans for the artesian well, will this be plugged/ capped, or are there other plans?	Included a description of this.		
Page 93: Comment [W51] Wade.McMillan 23/01/2014 12:11:00 PM	Does this require further investigation?	No. The question was a left over reminder and has been removed.		
Page 93: Comment [J52] Josee.Perron 06/02/2014 11:44:00 AM	There is no bridge over Victoria Ck; there is one over Dome Creek diversion. Can you please correct this?	Yes. This should be the bridge over the diversion ditch; text and figure has been updated.		
Page: 96 – Infrastructure Figure				
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:25:49 AM	Mount Nansen	Done.		



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Page: 97 - Infrastructure Figure Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:26:44 AM	ove?	Done.		
Page 102: Comment [CJD54] Chris Dixon 22/01/2014 11:36	There is no comment on permafrost nor any deep investigation information (other than BH-WA-13-01) in the waste rock. It is not uncommon in the north to see these long slope waste rock piles (Douglas Goering research) develop an area of “super cooling” where you get convection cooling in the winter and not enough conductive warming in the summer to warm the pile up, creating a pocket of cold permafrost, potentially making the pile quite difficult to excavate. There doesn't seem to be any comment on whether this state may exist along the southwest slope of the waste rock pile.	Supercooling is not expected in the Nansen waste rock piles because of the material gradations which are finer than the open gravel gradation typical of embankments in which convective cooling occurs. Text has been modified to include a short discussion of this.		
Page: 102 - Infrastructure Figure				
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:35:29 AM	Seepage Pond	Done.		
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:36:43 AM	Victoria Creek Wellhouse	Done.		



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Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:36:15 AM	Wellhouse	Done.		
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:35:43 AM	Cookhouse	Done.		
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:35:51 AM	Cookhouse	Done.		
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 11:31:44 AM	Camp Shed	Done.		
Page: 103 - Infrastructure Figure				
Author: jkperron Subject: Sticky Note Date: 06/02/2014 11:40:04 AM	There is no bridge there.	Done.		
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:40:15 AM	Mount Nansen site or former mine site.	Done.		
Page: 106 - Infrastructure Figure				
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:44:25 AM	Is more research needed to determine if pipe continues?	Done.		
Page 106: Comment [W55] Wade.McMillan 23/01/2014 3:52:00 PM	Please edit for clarity and sentence structure.	Revised text in report.		



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Page 107: Comment [W57] Wade.McMillan 24/01/2014 2:10:00 PM	See W32.	See W32 response.		
Page 107: Comment [W58] Wade.McMillan 23/01/2014 4:20:00 PM	In the vicinity of 2 mbgl?	Yes, corrected.		
Page 108: Comment [W59] Wade.McMillan 06/02/2014 4:14:00 PM	There are some piles to the north end which came from the pony creek adit area also.	Added in text.		
Page 110: Comment [CJD60] Chris Dixon 23/01/2014 3:34:00 PM	Please provide further comment and justification of the classification system being used (e.g. why a NPR > 2 was considered Non-PAG when only using static testing instead of an NPR > 3 or 4 as discussed in some literature, including Price 1997.)	Additional information is provided in the report. See Section 7.2.		
Page 112: Comment [CJD61] Chris Dixon 22/01/2014 12:21:00 PM	A larger discussion of the cut-off for NON-PAG of NPR > 2 should be included. Also, since there are areas where NPR < 2 and even NPR <1 are kinetic tests begun on selected samples?	Please see the above answer for the kinetic testing question. The waste rock samples from the 2013 Site Investigation are only represent samples with NPR<1 and samples with NPR>2. Waste rock with NPR between 1 and 2 are not available from last year SI program. The SC report		



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		includes the results from the previous waste rock geochemistry studies including several samples with NPR results less than 1 or between 1 and 2, and these samples are not available anymore.		
Page 116: Comment [W63] Wade.McMillan 23/01/2014 16:01	See W16.			
Page 122: Comment [W64] Wade.McMillan 04/02/2014 11:40	Should higher accuracy be obtained by gathering additional information or is this quantity acceptable?	A few more model checks should be done but otherwise no. More investigation would be expensive and would not provide the associated benefit.		
Page 124: Comment [W65] Wade.McMillan 04/02/2014 11:41	Figures are not numbered in order...	Corrected.		
Page 130: Comment [CJD66] Chris Dixon 23/01/2014 13:14	There should be a comment about the PSD of this result, versus the PSD of the 1,850 kg/cu. m SPDD mentioned above, as it reads that some of the tailings could exist at a highly compacted state.	These bulk densities are reported from previous testing and with one exception do not have PSDs associated with the specific tests. Note thought that these are bulk saturated densities. 2,000 kg/m ³ for the reported moisture content and GS corresponds to a void ratio of about 0.9		



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		which is in the high range of void ratios for spigotted sand tailings from hard rock mining (Vick). Discussion has been expanded in text.		
Page 133: Comment [CJD68] Chris Dixon 23/01/2014 3:35:00 PM	YESAA Documentation also refers to Price & Errinton 1998 which refers to Price 1997 which indicates a NPR > 4 as being inert and NP between 2 and 4 as being low potential, in some conditions. A discussion on which guidelines were chosen and why should be included here and also a discussion of which guidelines YESAA and the regulatory bodies will be expecting to see should also be had (but perhaps not necessarily be included in this document).	As discussed in Section 7.2, MEND issued the updated ARD/ML guideline in 2009. The updated guideline classifies the material into three classifications: NPR<1: PAG: NPR 1-2: Uncertain in acid generating potential. NPR>3: Non PAG		
Page: 134 – Tailings historic investigation figure				
Author: wsmcmill Subject: Sticky Note Date: 04/02/2014 10:53:01 AM	Figure sequencing skips numerals.	Corrected.		
Page 138: Comment [W70] Wade.McMillan 04/02/2014 11:45:00 AM	Please confirm recent survey results place the dam crest at 1099.8 m ASL, datum correction may be required.	Corrected, values were quoted directly from the design report without correcting for the change in elevation datum that has occurred since that time. A footnote has been added to that effect as a reminder for future.		
Page 138: Comment [W71] Wade.McMillan 04/02/2014 11:44:00 AM	See w70			



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Page: 140 – Tailings Xsection				
Author: jkperron Subject: Sticky Note Date: 06/02/2014 4:22:17 PM	Should make reference to G5 for the section.	Corrected.		
Page 144: Comment [W74] Wade.McMillan 04/02/2014 11:46:00 AM	Should testing be completed to acquire this information? <i>I think we should be looking into some of the old reports rather than saying there are no background concentrations available – there are some in EDI report R35 and some of the early baseline work – not sure who should look into this, and presumably should be done under the baseline budget as this is justifiably baseline information.</i>	Have reworded to say: Based on a cursory review of readily available data. These elemental metal parameters could appear to be naturally elevated in the Mount Nansen area. Further assessment of available project and published data as well as possible additional field verification should be completed.		
Page 146: Comment [CJD75] Chris Dixon 23/01/2014 3:35:00 PM	After retrieving sonic rig frozen core, no frozen core measurements were taken (e.g. frozen bulk density) and no frozen core consolidation testing was conducted (thaw consolidation tests). Are there still frozen samples kept that these tests can be conducted at a later date or were all samples allowed to thaw? Why was frozen core testing not including as a part of this program?	Frozen core testing was not included because the program was to be as cost effective as possible. While it would have been nice to get undisturbed samples of the insitu sands, there was sufficient information on the subsurface information from the design report which used CREEL barrel drilling. Similarly, it would be nice to know the insitu density of the tailings accurately, but given that the soils will be excavated and moved to the open pit		



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		with properties that are very different than the current insitu conditions the cost of undisturbed frozen sampling and preservation of the samples could not be justified.		
<p>Page 153: Comment [CJD76] Chris Dixon 22/01/2014 2:25:00 PM</p>	<p>There doesn't seem to be any discussion on the geotechnical properties in this area. Although, it may not be of a great concern for the majority of the area, it may be necessary to discuss and consider the geotechnical characteristics of the ponds if they are to be decommissioned. Specifically the presence/absence and potential nature of any permafrost in those areas.</p>	<p>Added new Section 13.2 to discuss general geotechnical characterization.</p>		
<p>Page: 159 Author: jkperron Subject: Sticky Note Date: 28/03/2014 3:05:45 PM</p>			<p>I think that the legend provided is wrong, especially for piezometers. According to the legend, there are piezometers in the new holes as well as on the tailing pond. I believe that these are mini-piezometers? In addition, instrumentation around the facility should be reviewed to ensure that this is accurate (i.e. compare with EBA</p>	<p>The figure has been checked and there were a couple of colour coding errors but the instrumentation shown is consistent with the EBA report and also includes the various standpipes and solinst loggers installed at the facility. The legend for piezometers includes standpipe piezometers (which include both mini piezos and monitoring wells) and</p>



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			latest instrumentation report).	pneumatic piezometers. A note has been added to the figure to clarify this.
Page 163: Comment [W80] Wade.McMillan 23/01/2014 15:32	Likely? Determined by comparison of soil sample results? Please comment.	Included additional clarification in text.		
Page 165: Comment [W81] Wade.McMillan 2 03/01/2014 16:58	Due to...	Included additional clarification in text.		
Page 165: Comment [W82] Wade.McMillan 23/01/2014 12:59	Please comment on why you think this is the case, soil sample from borehole, or is a recommendation for more testing need to be stated?	Included additional clarification in text.		
Page 165: Comment [W83] Wade.McMillan 04/02/2014 11:50	Why?	Added details.		
Page 174: Comment [J87] Josee.Perron 06/02/2014 16:31	Can we and should we get more points?	Addressed (did not recommend until remediation).		
Page 174: Comment [CJD88] Chris Dixon 22/01/2014 2:27:00 PM	Is it possible to collect this data at a later point? If so, this statement should be reworded or another sentence should be added to indicate that.	Addressed (not recommended until remediation).		
Page 180: Comment [W90] Wade.McMillan 23/01/2014 1:38:00 PM	Can you please comment as to how unanalyzed samples lead you to this conclusion? Also why they were not analyzed...i.e. field test kit results indicated no traceable amount,	Re-worded.		



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	therefore samples taken were not analyzed at a laboratory...			
Page 180: Comment [W91] Wade.McMillan 23/01/2014 1:30:00 PM	Can you please clarify why this method is not suitable... provides info. concerning mobility and not Which is required for...	Included additional clarification in text.		
Page 192: Comment [W93] Wade.McMillan 23/01/2014 2:59:00 PM	Could this please be reworded for clarity, e.g. Due to concern that... contain cyanide, testing was completed and the analytical results do not indicate... ?	Re-worded.		
Page 192: Comment [W94] Wade.McMillan 23/01/2014 1:53:00 PM	Again, please edit for clarity, e.g. Due to testing as indicated previously... it is not believed that cyanide contamination...	Edited.		
Page 194: Comment [W95] Wade.McMillan 06/02/2014 4:34:00 PM	Please add further comment as to why, the machinery was malfunctioning, difficulty of excavation in shale, hard rock?	Just hard digging through rock - the intent was not to dig deep holes but to assess the ripability of the rock and thus qualitatively it's suitability for durable gravel. Text has been updated with a footnote added.		
Page 199: Comment [W96] Wade.McMillan 06/02/2014 4:35:00 PM	Does this imply the trenches may need to be filled and graded, all contributes or certain ones?	Not necessarily, the contributions from each trench will depend on the specific rocks exposed in each trench and then the need to reclaim them depends on the overall effect of that runoff on the site water quality. This is		



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		outside the scope of the site characterization report. A comment has been added that this requires consideration in the site water quality modelling and assessment of trench reclamation. This particular trench though is intended to be reclaimed.		
Appendix A = Permafrost				
Page 1: Comment [CJD98] Chris Dixon 23/01/2014 1:17:00 PM	The section on future air temperatures (3.3) seems to be using old information (1997 is the date of the reference) The models have been updated since then, specifically the CSA TECHNICAL GUIDE Infrastructure in permafrost: A guideline for climate change adaptation describes similar tables that were updated in 2009. How does this section compare to the tables discussed in that guide?	The two methods give almost exactly the same values for the first 30 to 40 years. Further out the CSA guide gives warmer temperatures. This has been added to the discussion. Although not included in the report discussion, we do note that the CSA guide is based on IPCC AR4 and that there is now AR5 which we understand has lower temperature increases.		
Page 1: Comment [CJD99] Chris Dixon 22/01/2014 3:51:00 PM	There is no reference section in this memo, but plenty of references made in the text of the memo.	Reference section added.		



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Appendix C- Surface water				
Page 4: Comment [W100] Wade.McMillan 24/01/2014 11:26:00 AM	Sentence structure.	Fixed.		
Page: 233 – Permafrost memo				
Author: wsmcmill Subject: Inserted Text Date: 04/02/2014 11:56:58 AM	Mount	Fixed.		
Page: 234 – Permafrost memo				
Author: wsmcmill Subject: Inserted Text Date: 04/02/2014 11:57:26 AM	Mount	Fixed.		
Formatting Comments				
	Please review the use of numerals vs. written numbers in sentences... inconsistent use throughout. Noticed a number of suggested corrections or identical comments from uncorrected copy/paste inserts of MN SI report.	The report has been proofread for this.		
Page 5: Comment [W6] Wade.McMillan 23/01/2014 2:16:00 PM	Is Site the proper name of a place or merely referring to the location in general?	Have "searched" for consistency.		



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Page 47: Comment [W24] Wade.McMillan 24/01/2014 1:50:00 PM	Title, is this the same as SW8? If this is a copy paste error, it may explain the discrepancies in TOC numbering from this point on in.	TOC updated.		
Page 72: Comment [W42] Wade.McMillan 04/02/2014 10:15:00 AM	Please remember to include page numbers on pages with figures... not present in PDF version.	This cannot be done with the title blocks provided for the project.		
Page 77: Comment [W43] Wade.McMillan 24/01/2014 2:00:00 PM	Title and not in TOC.	TOC updated.		
	Is this WQ1?			
Page 98: Comment [W53] Wade.McMillan 24/01/2014 14:06	Title or part of Figure 11-1?	Corrected.		
Page 107: Comment [W56] Wade.McMillan 24/01/2014 2:10:00 PM	Should these be included in TOC?	TOC updated.		
Page 116: Comment [W62] Wade.McMillan 23/01/2014 4:24:00 PM	Ca CO3/t chemical formula is properly formatted in other document locations, please copy paste to edit ones like this.	Corrected.		
Page 133: Comment [W67] Wade.McMillan 24/01/2014 14:18	Should this be included in TOC?	TOC has been updated. Per the Project Writer's guide, 4 th level headings are not numbered. These have been consistently removed from the TOC.		



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Page 134: Comment [W69] Wade.McMillan 24/01/2014 2:18:00 PM	TOC?			
Page 142: Comment [W72] Wade.McMillan 24/01/2014 2:20:00 PM	TOC?			
Page 142: Comment [W73] Wade.McMillan 24/01/2014 2:20:00 PM	TOC?			
Page 153: Comment [W77] Wade.McMillan 24/01/2014 2:23:00 PM	Bullet format			
Page 155: Comment [W78] Wade.McMillan 23/01/2014 3:32:00 PM	Please be uniform with use of bullets throughout document.			
Page 163: Comment [W79] Wade.McMillan 24/01/2014 14:25	TOC? Etc... for page	Per the Project Writer's guide, 4 th level headings are not numbered. These have been consistently removed from the TOC.		
Page 166: Comment [W84] Wade.McMillan 24/01/2014 14:26	TOC?			



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Page 166: Comment [W85] Wade.McMillan 24/01/2014 14:26	TOC?			
Page 168: Comment [W86] Wade.McMillan 24/01/2014 14:29	Same font and bold, TOC? Same comment for the rest on page. Inconsistent use of font, bold, underline for next several pages, please correct for consistency.			
Page 176: Comment [W89] Wade.McMillan 24/01/2014 2:31:00 PM	Titles do not match previous font selection for identical titles, please use consistent format.			
Page 189: Comment [W92] Wade.McMillan 24/01/2014 2:37:00 PM	TOC and format.			
Page 205: Comment [W97] Wade.McMillan 24/01/2014 9:36:00 AM	Will the name of the report be inserted in the final version?			
Page 21: Comment [W18] Wade.McMillan 24/01/2014 13:38	Missing from TOC			
Page 21: Comment [W19] Wade.McMillan 24/01/2014 13:38	Missing from TOC			



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Page 47: Comment [W24] Wade.McMillan 24/01/2014 1:50:00 PM	Title, is this the same as SW8? If this is a copy paste error, it may explain the discrepancies in TOC numbering from this point on in.	Corrected.		