

Table 2-1 Wastewater Treatment Options Issues / Questions and Responses

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
<i>Wastewater Treatment Technology Options</i>			
1	Is the ADWF of 108 MLD a Project Board Terms of Reference criteria or a conclusion drawn by the project Board?	The 108 MLD is in the Project Board terms of reference. The 108 MLD ADWF is based on an extensive assessment of flows that has been completed by the CRD and CH2/KWL/ Associated team. This information has been recently reviewed by Stantec and is based on current measured flows. Checks have been made on the reasonableness of the estimates and outfall flow meters have been checked to confirm accuracy. The flows have dropped during the period of 2010 to 2015 due to water conservation initiatives and other factors such as low flow fixtures. The 2016 ADWF numbers have recently been received and indicate ADWF is 72 MLD up 2 MLD from 2015 numbers. The 108 MLD flow provides a reasonable allowance for growth beyond the plant commissioning date.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
2	<p>Where are the MWR requirements summarized or described that impact the project design?</p> <p>Final Comment: Section 2 states the relevant Regulations and Acts and Section 4 states wastewater characteristics. There is no information provided regarding Discharge Registration requirements and time-line implications for the project schedule, and it is recommended and these should be taken into consideration in the time-line.</p>	<p>The MWR requirements are outlined in Section 2 of the report. Further design requirements are outlined in Section 4.0 of the report.</p>	YES
3	<p>Appendix D indicates the project is assumed to be a Category I facility ("facilities for which short term effluent degradation could cause permanent or unacceptable damage to the receiving environment"). How was this determined, and has it been reflected in the cost and sizing assumptions?</p> <p>Was the facility Category rating taken into</p>	<p>The existing CRD discharge has been characterized by the federal government as a high risk discharge. We believe Category 1 is the appropriate rating given that the waters near the outfall are used recreationally by wind surfers and previous outfall modeling has indicated the potential for the effluent plume to surface during certain tide conditions. There is no significant</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>consideration in sizing and costing (e.g. reliability requirements)?</p> <p>Final Comment:</p> <p>The primary difference between Category requirements is with respect to back-up power supply. Although the federal government has determined this is a high-risk discharge, the BC MWR definition is specifically related to "permanent and unacceptable damage" that could occur as a result of short-term equipment failure. Given the lack of documented damage to the environment as a result of the current practice of discharging raw sewage, and the indicated low probability of plume surfacing coinciding with a power failure, there may be some cost savings in considering whether a Category 1 classification is appropriate.</p>	<p>difference in the facilities that would be built between category classifications with respect to redundancy for a plant of this size. Using good engineering practice we have allowed the appropriate level of redundancy in the indicative design and costing for reliability requirements outlined in MWR.</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
4	Conveyancing is part of the Project Board TOR. Where is the conveyancing to transfer waste biosolids to Hartland discussed?	Conveyancing for transfer of solids is included in the cost estimates for the project. We will add a section to the report to discuss the pumping of residual solids to Hartland landfill.	YES
5	<p>Does the Hartland biosolids conveyancing assessment take into consideration the potential for, corrosion, or odour or methane generation?</p> <p>Follow-up comment: The report would be strengthened and be more transparent if this information was included.</p>	<p>Yes the Hartland solids conveyancing does take into account consideration for odour generation. Odour control facilities were priced to be included in each of the residual pumping stations. In addition there is provision at the plant(s) to add chemicals directly to the residual solids pipeline if hydrogen sulfide and methane become an issue. We would also include provision at the intermediate residual pumping stations for chemical addition, if necessary.</p> <p>Follow-up response: We have added a section to the biosolids report which covers the residual solids conveyancing.</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
6	The Worley Parsons report (referenced on page 15 of Appendix D) lists species at risk for the McLoughlin Point discharge area. What is the significance of this list for the McLoughlin Point discharge under the Species at Risk Act, and has a similar assessment been made for Clover Point or any other areas that were considered for an outfall?	The Worley Parsons report was an EIS prepared for the McLoughlin outfall. The addition of secondary treatment and a well-designed outfall diffuser will mitigate risk to species at risk. We assume that similar species would be present near the existing Clover Point outfall, but a separate report has not been prepared for the Clover Point outfall. A similar assessment would be required as part of an EIS screening assessment if Clover Point outfall was ultimately part of the selected option. The Worley Report was prepared specifically to addresses the EIS for the McLoughlin outfall.	YES
7	The treatment system will need to essentially completely nitrify the effluent to meet the requirements for ammonia, reducing alkalinity and potentially affecting pH. Does the CRD wastewater have sufficient alkalinity, and where in the report has this been considered?	The treatment system does not need to fully nitrify. The allowable unionized ammonia based on federal regulations is 1.25 mg/L. Our calculations indicated even with a very high effluent ammonia load of 40 mg/L (worse case scenario) that unionized ammonia will be below 1.25 mg/L. We reviewed our calculations with MOE and Environment Canada and both were in agreement that nitrification would not be	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
		required. Other consulting firms have had similar findings to Stantec.	
8	<p>For Tertiary considerations, what reuse effluent quality has been assumed? (i.e., indirect potable, greater exposure potential, or moderate exposure potential)</p> <p>Follow-up comment: The report would be strengthened and be more transparent if this information was included.</p>	<p>The exposure potential will ultimately depend on the ultimate end use of the reclaimed water. We expect that if reclaimed water is used it would be for uses such as irrigation in summer months only. CRD uses surface water for water supply so we do not see any reason for indirect potable water reuse.</p> <p>Follow-up response: We will include discussion on water reuse.</p>	YES
9	The Lamella clarifier was selected as a primary clarifier for costing purposes, as it can operate without chemicals during normal operation, but CEPT is being considered for enhanced primary treatment for flows exceeding 2xADWF. Was the impact of adding chemicals to enhance primary treatment on the performance of a Lamella taken	Yes, CEPT was considered to enhance primary treatment performance and this will in fact be the case during wet weather operation. To reduce overall operating costs due to chemical and additional sludge production, CEPT operation on a continuous basis is not desired.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	into consideration?		
10	The BAF process has a small footprint and doesn't require clarification. However, it requires a significant amount of process water for backwashing and is subject to media clogging and operational difficulties. Was this taken into consideration in selecting the technology for project sizing and costing, and are other secondary treatment technologies also being assessed to determine whether they can fit on the Rock Bay or McLoughlin Point site, and the comparative costs of those technologies that can fit?	The BAF process water used by the BAF for filter washing is derived from the treated effluent. Low head pumping combined with air scour has proven to be effective in cleaning BAF filters at other operating facilities. Stantec has designed BAF facilities at Windsor and Canmore and we have not experienced the operational issues you have noted. Other technologies were considered for the Rock Bay and McLoughlin sites. For the two plant options other technologies could fit on the site. However for single plant 108 MLD option, other high rate technologies including MBR and MBBR will not fit on the site without extraordinary costly measures such as stacking unit processes that will significantly drive costs higher. It is noted for the McLoughlin site there are also set back requirements from high water mark so this further limits the available usable site area. We note that the original procurement for McLoughlin allowed the use of any technology and did not require	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
		bidders to use the indicative technology. All three bidders proposed BAF. Stantec has designed plants using a variety of treatment technologies. Many different technologies could be considered for CRD if the sites were large enough to accommodate these technologies.	
11	In Section 5, after a general statement indicating that only proven high rate representative technologies that meet the discharge objectives which have been constructed in numerous other locations in North America and Europe will be further assessed, the suitable technologies list is reduced from 15 to 3 options. Either additional columns need to be added to Table 5.1 or an explanation as to why the other 13 technologies were eliminated (and one added). The first suitable technology is High Rate or Conventional Activated Sludge. In Table 5.1, Conventional Activated Sludge is listed as requiring a large footprint, one of the initial criteria for rejecting a technology.	The technologies selected are representative technologies that will meet the regulatory requirements. For multi-plant options, which have a smaller capacity, such as for example a smaller 48 MLD plant at Rock Bay, a high rate activated sludge plant would fit on the site. However a 108 MLD high rate activated sludge would not fit on the site. We can add an additional column to Table 5.1 to provide further explanation. There have been many sites investigated over the years for this project. All of the sites have had limited available space and as such high rate technologies must be used. We note that the technologies are <u>representative</u> for the purposes of costing and establishing program budgets. The design build proponents were allowed to propose any	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>Follow-up comment:</p> <p>The report would be strengthened and be more transparent if an additional column was added to Table 5.1 and text was included in the body of the report to explain how given options were retained or rejected.</p>	<p>technology they desired, provided it had a service track record and would fit on the available sites.</p> <p>Follow-up response:</p> <p>We will add text to describe the process for rejecting or including a technology.</p>	
12	<p>Section 5.3 noted Conventional Activated Sludge (CAS) treatment has an attractive life-cycle cost and its capacity can be enhanced by adding MBBR media. However, it is noted that it requires significant space and “may be a viable option for two or greater plant configurations due to their smaller capacity”. This implies that CAS was deemed largely non-viable from the start. As implied by Section 5.3, the MBBR process has a significantly smaller footprint and, accordingly, would fit onto more sites. So, why wasn’t an MBBR process used, instead, to compare with the MBR and BAF</p>	<p>We are looking at representative technologies for the purposes of budgeting. The MBBR will provide a smaller bioreactor. However, there will still be a requirement for primary and secondary clarifiers or, if membranes are used for solids separation, a membrane tank. Depending on the site and the capacity of the plant, these technologies may or may not fit on the site. For dual plant options they may fit due to smaller individual plant capacity but, for a single plant option, they will not fit on the sites under consideration.</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	technologies for size and cost?		
13	<p>There are a number of inconsistencies in the way options involving Chemically Enhanced Primary Treatment (CEPT) are presented and screened in Sections 4 and 5, respectively.</p> <p>What is the reference to the enhanced BOD and TSS CEPT removals referenced in Section 4.6.1?</p> <p>Was the BOD reduction due to CEPT factored into selecting viable secondary treatment technologies in terms of site footprint and life-cycle costs?</p>	<p>The reference is to primary treatment operating <u>without</u> CEPT. We agree that with CEPT the removal rates for BOD and TSS will be higher. The removal rate with CEPT can be highly variable depending on wastewater characterization, coagulant chemical dosage, temperature, etc.</p> <p>To reduce overall carbon footprint and sludge production the normal operation will be without CEPT. CEPT is proposed only during wet weather events. Continuous operation in CEPT could lead to a smaller secondary treatment process however it will be at the sacrifice of additional life cycle costs due to chemical addition and sludge production.</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>What surface overflow rate was assumed in assessing the effects of CEPT on plant footprint and waste biosolids mass and volume?</p> <p>Would conventional clarifiers and CEPT fit on the sites at the surface overflow rates and BOD and TSS reductions noted in the Brightwater study? If so, would that be a more cost effective approach than Lamella or Ballasted clarification with CEPT?</p> <p>Were the effects of CEPT on biosolids mass and volume and treatability taken into consideration in assessing biosolids treatment and disposal options?</p>	<p>The surface overflow rate selected was 290 m³/m².d, lamella plates at 55° angle and individual plate loading at 32/m³/m² per day. These loading rates are consistent with installations at other locations and recommendations from several plate suppliers. The loading rates are similar to those used by three proponents who bid the original McLoughlin procurement.</p> <p>If we had the available site we agree that conventional clarifiers would be an option. Our opinion is the cost would be similar because there are significant cost savings in structure size when using plate sedimentation, including the footprint is typically reduced to about 60% of conventional clarifiers.</p> <p>Yes, we have attached mass balances that were prepared for non-CEPT and CEPT operational modes for the original McLoughlin procurement.</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>Follow-up comment:</p> <p>In reviewing the McLoughlin Site BAF Mass Balance diagrams, we noted that it doesn't appear to take into consideration losses in biomass due to biological degradation, with the volatile fraction consistently about 90% throughout the process.</p> <p>Further, the TSS concentration with CEPT is noted to be lower in the diagrams than without chemical addition (15,000 versus 20,000 mg/L), whereas one would expect a higher percentage of solids content</p>	<p>Follow-up response:</p> <p>The secondary biological process reduces both soluble and non-soluble (VSS) substrate, while at the same time it also generates new organic material in the form of biomass. Thus the VSS reduction is only one part of the biological process. The mass balance calculation starts and finishes with the mass loading of the main flow, degradation, and the sludge flow. The secondary / final effluent is a result / balance of these main mass flow calculations, and represents a small fraction of the mass. In fact, the VSS percentages throughout the main liquid stream do vary from 88% to 93.8%. The raw wastewater, primary and secondary sludge loads and volatile fraction are the governing factor. All are consistent with real plant operational data and Metcalf & Eddy values.</p> <p>The TSS concentration depends on both the load and flow. With wet weather flow and CEPT, more flocculants form but this does not necessarily suggest more concentrated sludge because</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>with chemical coagulation and flocculation.</p> <p>1) Has the biological reduction in biosolids been taken into consideration in another manner, or was the mass of waste solids indicated in the diagrams used for the biosolids management design?</p> <p>2) Also, the addition of CEPT increased the projected BOD removal from 34 to 46% and the TSS from 66 to 77%. How were these removal efficiencies determined (i.e., what reference was used)?</p>	<p>wasting is more frequent. At these conditions, the sludge wasting will need to increase in both flow and frequency, particularly with Lamella plates. The increase sludge withdrawn is to keep the sludge blanket level at minimum 1-1.5 meter below the plates.</p> <p>Yes, the biosolids treatment portion is separated from the liquid treatment in this case.</p> <p>There are two components of the removal rates for CEPT in the BAF case, from raw wastewater and from the filter backwash returned flow. These removal rates are combinations of both, and supported from the actual operating data from BAF plants in Ontario and Alberta and BAF technology supplier data. The estimated raw wastewater removal rates are BOD 30% TSS 55% without CEPT, and BOD 45% and TSS 75% with CEPT. These estimated removal rates are also consistent with estimates provided by bidders during the original</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>Additional follow-up comment:</p> <p>Statements regarding the planned use of CEPT need to be clarified. For example, the reference to CEPT “must be applied” for flows up to 3 x ADWF for Clover and 4 x ADWF for MaCaulay could be interpreted as CEPT will be implemented for flows up to those levels, after which a bypass of raw sewage will be implemented. If the intention is to apply CEPT for flows in excess of those amounts, the implication is that treatment is being designed to handle those flows rather than providing primary treatment for flows exceeding 2 x ADWF as stated in the Municipal Wastewater Regulation.</p> <p>The benefits of applying CEPT should be clearly stated, referenced and used consistently in the assessment. The document indicates the only</p>	<p>McLoughlin procurement. The BAF backwash return stream has higher removal rates than those for the raw wastewater flow. As noted below, the removal rates are highly dependent on a number of factors.</p> <p>Additional follow-up response:</p> <p>Our expectation is that CEPT will not be implemented during normal wastewater treatment operations. At most locations where CEPT is implemented the influent flow and load are monitored to determine when or when not to use CEPT. Our expectation is that the plant will operate without CEPT up to 2xADWF and CEPT will only be applied when flows exceed 2xADWF.</p> <p>As suggested we will provide additional text to explain the CEPT benefits and operational rationale.</p> <p>The mass balances provided do take into account the volatile solids reduction in the treatment process. As with the preparation of any mass</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>primary clarifiers that are deemed suitable (based on limited land area) are lamella and ballasted primary clarifiers, with CEPT when flows exceed 3 x ADWF at Clover Point and 4 x ADWF at MaCaulay. The report concludes that a number of technologies have too large a footprint to be considered, such as conventional primary clarifiers with CEPT; however, these statements are not well supported within the report.</p> <p>The responses to DDP questions state that consideration for routine CEPT were not considered in order to reduce overall carbon footprint and sludge production, as well as life-cycle cost considerations for chemicals and sludge disposal, and is, therefore, only being considered for peak wet-weather flows.</p> <p>The mass balances that were prepared for non-CEPT and CEPT operation at the original McLoughlin procurement appear to be overly conservative with respect to waste biosolids generation as they do not appear to take into consideration a reduction in volatile biomass during biological treatment. This</p>	<p>balance, there are engineering judgements that are used based on experience. There will also be differences of opinion.</p> <p>The issue of sludge production, mass balances and estimates of sludge yield was outlined in the procurement documents for McLoughlin plant. All proponents were requested to provide a mass balance, sludge yield, primary sludge production estimates and secondary sludge estimates during dry and wet weather periods. While there were some differences in the estimates because of design assumptions and different removal efficiencies used in the design assumptions the estimates were within what we consider reasonable accuracy given the variables that are present in such a calculation.</p> <p>We believe the estimates provided for the residual solids yield for the biosolids facilities are not overly conservative.</p>	

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	observation should be verified and, if correct, the impact of accounting for biosolids reductions on the selection of technologies and costs for biosolids management should be reviewed.		
14	Three technologies were considered for use in establishing a budget and establishing an expected footprint. It should be made clear that they are considered to be representative but not exclusive.	The report states they are representative technologies. We will review and strengthen the language to provide more clarity.	YES
Integrated Resource Management (IRM)			
15	The DDP agrees that, as noted in Stantec's report, the most significant opportunities for IRM are associated with integration of solid waste, biosolids, and organic waste at the Hartland Landfill. Therefore, most comments regarding IRM are addressed in the biosolids section of this table.	No action required.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
16	<p>For the Liquid Stream, because of cost implications and budgetary concerns, provision for future IRM initiatives should be allowed for, but likely not implemented at this time until a separate business case has been established for each component.</p> <p>Follow-up comment:</p> <p>How will provisions for future IRM be implemented to ensure CRD IRM priorities are met, such that IRM opportunities are not eliminated? The Project Board should explain how provision for future IRM initiatives will be allowed for by stating the IRM measures that have established community value and the way in which allowance for future implementation will be established.</p>	<p>We are in agreement with this statement and will ensure provision is made in any design to accommodate practical future IRM initiatives.</p> <p>Follow-up response:</p> <p>IRM planning will take a number of years to complete and will require technical assessment, public consultation and likely changes to CRD policy to maximize IRM opportunities. Part of this planning will involve an evaluation of opportunities, benefits and overall business case for the strategy. Once the strategy is determined the CRD will have to determine how the project will be funded and what opportunities are available for support from the provincial and federal governments.</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
<i>Analysis and Screening of Wastewater Treatment Options</i>			
17	<p>The analysis and screening of wastewater treatment options is presented in Section 8. There is lack of clarity in the explanation regarding the method and process for screening options, and inconsistencies between the text explaining the approach, Figure 8.1 that graphically illustrates the process, and Tables 8.1 and 8.2 that summarize the screening outputs. The section should be rewritten to rectify these shortcomings.</p> <p>Notwithstanding the somewhat confusing way in which the evaluations have been presented, the screening of the options and final short-listing appears to be valid.</p>	Agreed. Section 8 has been rewritten to address the issues raised by the DDP.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>Final comment:</p> <p>The wording in Section 3, p.12 for why McLoughlin Point is the preferred option be strengthened by indicating that The McLoughlin regional plant was carried forward for further analysis as it is the least capital cost, lowest O&M and Life Cycle costs and has the lowest carbon footprint.</p>		
<i>Schedule Estimating</i>			
18	<p>Regarding the assumptions listed for scheduling, it is noted in Section 9.1 that for the analysis a screening level assessment would apply as a full EIS could take 16 to 24 months. What is the basis for assuming only a screening level assessment would apply? Is this a realistic assumption?</p>	<p>In fact, McLoughlin EIS required 30 months to complete. Therefore, the EIS criterion will be changed to reflect this. Assuming a screening level of assessment based on twinning of existing permitted outfalls for which there is a significant body of data, and the knowledge that twinned outfalls would discharge effluent of a significantly greater standard that meets regulatory requirements.</p> <p>The basis for the assumption that an EIS could be completed in a shorter period at an existing outfall</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
		is the fact that the CRD has already developed a dispersion model for both the Macaulay and Clover Point outfalls. There is also extensive water column and sediment monitoring data that is available at both of these locations. Our estimate of 14 months approval is based on input provided by an outfall expert who has worked on most of the outfalls on Vancouver Island, including the recent permitting for the proposed McLoughlin outfall.	
19	It is noted in Section 9.2 that only Options 8 and 8a have the potential to satisfy the federal regulatory deadline of 31 December 2020. To what extent has this date driven the selection of the McLoughlin options?	The Project Board’s Terms of Reference include as one of its goals: “Meet or exceed federal regulations for secondary treatment by December 31, 2020.” The Project Board recognized early in its process that if they screened out options that could not meet this deadline, very few of the options would make it through. So they decided not to do that, and instead focussed on other criteria for the early screening and then the TBL assessment, including cost, for the final rankings. The McLoughlin options came through that process as being lowest cost and highest ranked on the other TBL criteria. The fact that they also allow for	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	<p>Follow-up comment:</p> <p>The use of the federal Regulatory deadline as a key criterion to ensure the selected option can meet current constraints is appropriate for the purposes of the September 30, 2016 funding submission. However, consideration should be given to reviewing options that were eliminated due to the assumption of not being able to meet the federal Regulatory deadline, but may have significant cost savings sufficient rationale for the federal government to consider an extension to the construction deadline.</p>	<p>the possibility of meeting the December 31, 2020 deadline is also a positive factor in their favour, but it was not by any means the driving factor.</p> <p>Follow-up response:</p> <p>There were no options eliminated due to the assumption of not being able to meet the Federal regulatory deadline that would have resulted in significant cost savings.</p>	
20	As noted for Table 8.1, the descriptions of the options in Table 9.1 vary slightly from those listed in Section 8.1. There should be consistency in the way any given option is identified throughout the analysis.	Agreed. Inconsistencies in option identification will be rectified in the final report.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
21	<p>Only three of a possible six schedules have been developed for the six short-listed wastewater treatment options. The numbering of the options does not correspond to the option numbers in Section 9.</p> <p>The schedules in Appendix 3 should mirror the options that are summarized in Section 9, Table 9.2. In addition, an overview of the various schedules should be provided under Section 9 to address the differences between them. For Mcloughlin, clearly, negotiating with the previous successful proponent is beneficial and will save time in the overall schedule.</p> <p>For the Rock Bay Plant and the biosolids plant at Hartland, if the RFQ process could proceed in parallel with the permitting process, approx. 4 months could be gained in the schedule that would allow the RFP procurement process to start immediately following the completion of the permitting process. If the permits are ultimately not obtained, and a revised site / layout was put</p>	<p>Comments noted. We are working on updating schedules at this time and will make appropriate revisions. We agree with your other comments and will make revisions to the final report.</p>	<p>YES</p>

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	forward, the successful proponents from the RFQ process could still be available for the RFP process when the revised permitting was approved.		

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
<i>Cost Estimating</i>			
22	Under Whole Life Cycle Costs, in section 10.1.2 Cost Estimates for Short Listed Options, it is stated that a discount rate of 4% was used for calculating whole life cycle costs. Section 10.1.1 indicates that both 4% and 6% discount rates were used for calculating life cycle costs, as part of sensitivity analyses. Throughout the analysis, reference is made to a 4% discount rate, with no further mention of 6% or cost sensitivity. This should be explained somewhere.	Agreed we will add text to the report to explain this as well as the outcome of the sensitivity analysis.	YES
<i>Triple Bottom Line Assessment</i>			
23	Public surveys were conducted to establish priority weightings (Survey Results - Page 6). How were these priority weightings reflected in the project TBL assessment?	The overall feedback obtained from public consultation was a consideration in weightings for the TBL. For example the some of the feedback from the public consultation included concerns about odour, impacts of conveyance construction, traffic and operation noise and these and other factors were incorporated into the TBL that is part of both reports.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
24	<p>The current report format being used by Stantec contains a lot of triple-bottom-line review information. Suggest the Project Board place this assessment information in a separate document and/or generate an Executive Summary (or separate summary document) that explains the rationale for site and treatment-level selection including all of the key factors and considerations along with a brief summary of locations and technologies that were considered and clear detailed reasons for rejection.</p> <p>The Project Board document needs to provide definitions for IRM elements being considered, Business Case, enhanced secondary, tertiary, etc.</p>	<p>We agree there is a significant amount of information related to the TBL and we consider including this information as a separately bound attachment. We will review the opportunity to create an executive summary for the reports.</p>	YES
25	<p>It is mentioned in Section 11.1 Evaluation of Qualitative Criteria, that economic criteria were not scored. However, dollars are, in and of themselves, a form of economic scoring. The issue then becomes how the economic criteria were applied once the environmental and social issues were assessed.</p>	<p>Acknowledged. Economic criteria were applied after environmental and social criteria were applied to the TBL assessment.</p>	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
26	The example used for ranking construction impacts refers to “fair”, and “poor”, rather than “poor” and “very poor” shown in the rankings description table. However, the ranking system shown in the TBL tables for each of the ten options for which TBL was undertaken refers to “fair” and “poor”. It is important that terminology be kept consistent throughout the analysis. Also, the terms rating and ranking are used interchangeably. Consistent use of terms is required.	The final report will include consistent use of terminology to eliminate potential for confusion.	YES
27	The term “Average” as used in the ranking system should be replaced with “Acceptable”, as average can be perceived over a wide range of attributes, depending on the person doing the assessment.	Average, as defined in the document, includes the term “acceptable”. Therefore, use of the term “Average” is appropriate. We had much discussion at Project Board and technical level over use of terminology and agreed on the approach that would be used. We would like to leave as is, as we do not believe there will be any material difference in outcome.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
28	The report notes that each option was assessed under a listing of considerations and evidence provided to support the conclusions reached. However, it is not always clear regarding how the evidence provided to satisfy a consideration supports the rating chosen. Consideration should be given to including a table of criteria and considerations and how these translate into the ratings of “very good” to “very poor”.	In some instances the evidence to support the conclusion is a judgement based on the attributes of the specific option under consideration. We will discuss internally to determine if there is a way to clarify any uncertainty.	YES
29	Table 11.1 Triple Bottom Line Assessment Framework (Weighted), requires a footnote indicating that “weighting x ranking = numerical result”. Owing to the subjectivity of assigning weightings and rankings, and the personal bias that can creep into such processes, it is important to state who was involved in the process (e.g., experienced professionals from across a range of disciplines), and the process followed (e.g., expert advice, sensitivity analysis, Delphi [or modified Delphi] to challenge assumptions). Regarding sensitivity analysis, was this done on the qualitative	Agree. We will add some notes on evaluators experience. Note that the TBL was completed independently by a number of professionals. As with any TBL there was significant discussion at the Project Board, technical team and advisors on the TBL rankings and weights.	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
	weightings and rankings to determine whether the preferred option(s) consistently came out at or near the top?		
30	Another issue related to interpretation of the outcome of the TBL is the tendency to view the numerical outputs as absolutes that are the deciding factor, rather than helping to inform the decision. The decision framework should be treated as a decision support tool. One way to lessen the focus on the numerical output is to divide the output into ranges that are represented by marks . . . “A”, “B”, “C”, etc., with only those options that achieve an “A” going forward for further/final consideration.	The Project Board and advisors had significant discussion on different approaches to the TBL and how to describe the outcomes. The approach used is a consensus after much discussion, but there is full agreement that conversion of the qualitative descriptions into numbers is simply to assist in decision-making, and the numbers are not to be viewed as absolutes.	YES
31	There may also be an overlap in criteria between EN-02 Heat Recovery Potential combined, EN-03 Water Reuse Potential and EN-05 Flexibility for Integrated Resource Management and Resource Recovery.	Heat Recovery Potential and Water Reuse Potential are key criteria in the assessment of the liquid train only and related to the resources that can be extracted from the liquid train. These are “potential” opportunities provided there is a demand for the resource. IRM relates to the planning process for the	YES

No.	Question or Issue Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Wastewater Stream			
		integrated liquid, biosolids, municipal solid waste and organic waste streams.	

Table 2-2 Biosolids Treatment Options Issues / Questions and Responses

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
<i>Biosolids Treatment Technology Options</i>			
1	<p>In the biosolids report, section 1.6 states that the CRD Board has adopted the Regional biosolids Management Policy banning the land application of treated biosolids, both inside and outside the CRD. In addition, the first level of screening for the biosolids technologies includes “non-reliance on land application for disposal of biosolids”. This is consistent with the current CRD policy, but is this restriction providing the best solution in the long term? Land application of Class A biosolids is common practice in other BC Communities and on a global scale and, eventually, CRD policy will most likely be changed to reflect this. Eliminating technologies based on land application of biosolids at this stage could result in a less effective technology, or less cost effective solution for biosolids treatment both now and in the future. If this first level of screening for land application of</p>	<p>A thorough assessment of biosolids options was completed in a comprehensive biosolids management plan prepared by Stantec / Brown and Caldwell in 2009. This report examined all options including beneficial reuse and most of the options that were on the long list of options. The report ultimately recommended thermophilic anaerobic digestion to produce a Class A sludge and drying of sludge to reduce the volume of material to be handled and produce a fuel for waste to energy or cement kilns. What is being suggested now is still thermophilic anaerobic digestion that produces Class A sludge and provides the most flexibility for ultimately beneficial reuse if and when the CRD changes its policy. We do not believe that our recommendation would be any different even if a full beneficial reuse program were in place at CRD</p>	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
	biosolids was eliminated, what other technologies would be shortlisted, and would they provide a better solution in the long term?	right now.	
2	There appears to be a lack of differentiation between secondary and tertiary options for biosolids. Would it be correct to interpret that with respect to the biosolids generated by secondary and tertiary options, they weren't considered separately due to the variation in mass and volume was within the limited accuracy of a Class D cost estimate +/- 20%?	The difference in residual sludge quantities generated by tertiary treatment is an additional 2100 kg/d. This can be accommodated within the current cost estimates.	YES
Integrated Resource Management (IRM)			
3	Section 4.2 – Facility Staging for Ultimate IRM, of the Stantec report, provides a reasonable assessment of IRM opportunities. Additional information (EN-05) is contained in the Screening Summary matrices contained in Appendix A of the report.	No action required.	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
<i>Analysis and Screening of Biosolid Treatment Options</i>			
4	The analysis would benefit by additional information on the approach used to screen options, including application of pass / fail ratings, who was involved in the options screening, the ranking / weighting process used to rank alternatives, and use of sensitivity testing.	Agreed. The section of the report that explains the approach used to screen options will be rewritten to ensure greater clarity of the process followed.	YES
5	We note that the option names and descriptions listed in Section 4 differ somewhat from those used in Table 4.1 Summary of Options for Initial Screening – Solids Management. This is somewhat confusing and should be rectified, either by changing the option descriptions in Section 4, or changing them in Table 4.1, so consistent descriptions are used throughout. The same comment applies to the list of six short-listed options identified in Section 4.1.	Agreed. Inconsistencies in option identification will be rectified in the final report.	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
6	<p>Section 4 Biosolids Options Analysis and Discussion of the Stantec report indicates that a two-phase process was applied to screening potential biosolids options. Phase 1 applied four screening criteria (proven technology, land application, feed stock or disposal, and integration with municipal solid waste). Regarding the land application criteria, since CRD does not allow land application as a means of final disposal of treated biosolids, this criterion favoured technologies that did not rely on land application as the sole means of final disposal. We question whether potentially promising opportunities have been screened out that would be viable in future if CRD policy was to change.</p> <p>Notwithstanding, the four criteria used for Phase 1 screening appear to be a reasonable set of criteria for initial screening.</p>	<p>Due to the CRD policy on banning land application within or external to CRD there are some technologies that could not be considered.</p> <p>Working within the constraints of the CRD policy, the evaluation team assessed options that would provide a robust biosolids treatment while at the same time consider future opportunities for beneficial reuse and ultimate integration with MSW. It was felt that producing a Class A biosolid would provide the best opportunity for the CRD in the future to consider a range of beneficial uses if the policy changes.</p>	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
<i>Schedule Estimating</i>			
7	Information regarding the schedules for the six short-listed biosolids options is confined to Table 6.1 - Triple Bottom Line Assessment Framework, where it is identified as EC-05 Schedule of Completion, with estimated completion dates for each option. There is no discussion or task-by-task breakdown of design, permitting, construction, or commissioning timelines in the document, including the Screening Summary Sheets included in Appendix A – Triple Bottom Line Considerations. Absence of this information is considered a shortcoming. Therefore, including this additional scheduling information would lend greater credibility to the biosolids options report.	Schedules for the biosolids component of the CAWTP are included in Appendix C of the wastewater treatment report. They will be reproduced for inclusion in an Appendix in the biosolids report.	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
Cost Estimating			
8	<p>Section 5 - Opinion of Probable Costs of the Stantec report identifies the capital, O&M, and life cycle costs for each of the six short-listed options.</p> <p>The footnote to Table 5.1 – Life Cycle Costs, indicates that these costs have been estimated using a 4% discount rate. As noted for the liquid waste treatment options, both 4% and 6% discount rates were used. We question whether the same approach was taken for the biosolids options and, if not, why not?</p>	<p>The sensitivity analysis with different discount rates was completed on the liquid train report. The sensitivity was mainly completed using 4% and 6% discount rates at the request of the Project Board. Following completion of the sensitivity analysis it was agreed that 4% would be used for the biosolids report.</p>	YES
9	<p>Section 5.3 Discussion on Life Cycle Costs notes that the three options that involve solids going to a landfill biocell (Options 4, 4a and 5) have the lowest overall costs, but Option 5 may have permitting and other issues related to handling. We could not find information in the report that substantiates this statement. The report would be strengthened by its inclusion.</p>	<p>The main reason option 5 would have permitting issues is because the sludge is undigested and has a higher pathogen content. Regulators are reluctant to approve raw sludge storage. We will add language in the report to outline this concern.</p>	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
<i>Triple Bottom Line Assessment</i>			
10	<p>Triple bottom line assessment is discussed in Section 6 of the Stantec report.</p> <p>The environmental and social criteria for assessing the six short-listed options are generally appropriate. However, we question whether there may have been some overlap in assessment criteria, particularly between EN-02 Exceeds Regulatory Requirements and EN-03 Redundancy which includes reliability requirements related to redundancy features under the Municipal Wastewater Act; EN-02 and EN-04 Resource Recovery Beneficial Reuse (for phosphorous fertilizer production); and EN-04 and EN-05 Future Potential for Integrated Resource Management with MSW (energy from gas; water recovery/reuse, phosphorous fertilizer production)</p>	We will review categories and make revisions if appropriate.	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
11	Table 6.1 – Triple Bottom Line Assessment Framework (weighted) appears to show that there is overt weighting between environmental and social criteria, since each category includes eleven separate criteria used for evaluation. However, for six of the eleven social criteria, the results are the same across each of the six options. The net result is that these six criteria have no effect on the evaluation, such that environmental issues have a defacto higher weighting than social issues for the triple bottom line assessment.	We agree that some of these criteria have the same scores and have no effect on the evaluation. However, as a matter of record the Project Board felt is important to retain because they are still considerations in the overall TBL evaluation. Many of these criteria are social criteria that are important to the public so our collective opinion was that these criteria should be included in the evaluation.	YES
12	The screening summary sheets included as Appendix A need to be updated to ensure that: option numbers identified at the beginning of the assessment carry through for short-listed options; option numbers are repeated at the top of columns on each page of the summary matrix so assessment can be followed from page to page, and to ensure that options haven't been accidentally dropped from the matrix, which appears to be the case for at least one option.	Agreed. The screening summary matrices will be updated to reflect the identified issues.	YES

No.	Issue /Question Raised by DDP	Project Team Response	Question Answered / Issue Resolved (YES / NO / PARTIALLY)
Biosolids Stream			
	<p>In many cases, no evidence is provided for options in response to the considerations that are listed in the considerations identified for each criterion.</p> <p>In some cases, the evidence provided for each option for a given criterion and set of considerations states that there is no material difference in how the options meet the criterion. The proper way of presenting this information would be to provide evidence that addresses the consideration for the base case option or, alternatively, the first option listed, then indicate for the remaining options that there is no material difference in how the options meet the criteria. Failure to follow this protocol results in questions regarding the potential severity or lack of severity of potential impacts.</p>	<p>Evidence will be included in support of all considerations listed.</p> <p>Evidence will be provided for the first option column to reflect the considerations listed. Evidence for the remaining options will indicate “no material difference” where this is the case.</p>	<p>YES</p> <p>YES</p>