Mackenzie Valley Land and Water Board
7th Floor - 4922 48th Street
P.O. Box 2130
YELLOWKNIFE NT X1A 2P6
Phone (867) 669-0506
FAX (867) 873-6610

Staff Report

Applicant: Department of Indian Affairs and Northern Development (DIAND) – Contaminants and Remediation Division (CARD) – Bullmoose Ruth Remediation Project	
Location: Former Bullmoose, Ruth, Beaulieu, Spectrum, Chipp, Storm, and Joon mines, NT	**Application:** MV2016L8-0004
Date Prepared: October 16, 2017	**Meeting Date:** October 25, 2017
Subject: Bullmoose Creek Channel Design and Reconstruction Plan	

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a Channel Design and Reconstruction Plan, Rev. 3 (Plan) submitted by DIAND-CARD to fulfill Part D, item 12 of Water Licence MV2016L8-0004 (the Licence), for Board approval.

2. Background

- December 5, 2016 – Issuance of the Licence for 5 years;
- September 15, 2017 – Plan submitted;
- September 15, 2017 – Plan distributed for review;
- October 4, 2017 – Reviewer comments and recommendations due and received;
- October 11, 2017 – Responses received;
- October 16, 2017 – DIAND-CARD submitted email clarification; and
- **October 25, 2017 – Plan presented to the Board for decision.**

3. Discussion

Submission Description

The Channel Design and Reconstruction Plan, Rev. 3 (attached), describes the design of temporary diversion of Bullmoose Creek, excavation and disposal of contaminated sediment, and reinstatement of the creek channel. Board staff note that the related issue of disposal of excavated materials in an on-site landfill was covered by the Landfill Design Plan, approved by the Board on July 6, 2017.

The Plan was finalized with the assistance of Fisheries and Oceans Canada, which provided a cover letter that accompanied the submission. Board staff analysis of the Plan's adequacy in addressing Licence requirements is included below in the conformity table in the Comments section of this Staff Report.

Licence Requirements

Part D, Item 12 of DIAND-CARD's Licence requires submittal of a Channel Design and Reconstruction Plan:

> The Licensee shall submit to the Board, for approval, 90 days prior to the diversion of Bullmoose Creek for the removal of sediments, a **Bullmoose Creek Channel Design and Reconstruction Plan**. The Licensee shall not commence Construction until the Board has approved the Plan. The Plan shall meet the objectives listed in Part D, item 1 and Schedule 2, item 4.

Part D, item 1 states that:

> The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Waste are designed, constructed, and maintained to prevent escape of Waste to the Receiving Environment.

Schedule 2, item 4 states that the Bullmoose Creek Channel Design and Reconstruction Plan shall include, but not be limited to, 18 objectives. These are listed in Table 1 (see below) as well as how they have been addressed in the Plan.

4. Comments

In accordance with Part D, Item 12 of the Licence, the Plan contains a section which shows where in the Plan each requirement of the Licence is met. Table 1 below lists the required components of the Plan and details on the adequacy of the submission.

Table 1: Plan/Report Completeness

	Components of the Plan as required in Schedule 2, Part D, item 4 of the Licence	Board staff analysis of the adequacy of the Plan in addressing the component
a)	A design plan, with supporting analysis, timing considerations, and description of the purpose of each component or Engineered Structure of the design;	Adequate – background information is included in the Plan as required, supplemented by Proponent response.
b)	Information on the natural flow of Bullmoose Creek;	Adequate – background information is included in the Plan as required.
c)	Anticipated flow volumes during diversion;	Adequate – background information is included in the Plan relating to anticipated flows during proposed work period. The period of low water coincides with the work schedule. Diversion is no longer likely to occur.
d)	Any changes to flow characteristics in the reinstated channel;	Adequate – background information is included in the Plan as required.
e)	For-Construction drawings stamped and signed by an Engineer of all drainage, diversion, and Discharge structures	*Partially Adequate* – initialed designs are included in digital package, but not the final stamped versions. The proponent indicates that stamped copies will be made available.
f)	Location of the diversion dam;	Adequate – background information is included in the Plan as required.
g)	The Construction and materials specifications;	Adequate – reviewers requested information on possible alternatives, but the Licence

		specifically authorizes CARD to construct a dam for diversion.
h)	The Construction and materials Quality Assurance and Quality Control program;	Adequate – background information is included in the Plan as required.
i)	The details for dam removal including removal procedures, sediment and erosion controls, and monitoring requirements;	Adequate – background information is included in the Plan as required.
j)	Timing and duration of the diversion;	Adequate – background information is included in the Plan as required. Reviewers recommended that work be carried out during low flow or frozen conditions to minimize impact to the receiving environment. CARD agreed and stated that the proposed construction period coincided with low flow.
k)	Details of all dewatering requirements;	Adequate – dewatering is not expected to be required during excavation and reconstruction activities.
l)	The design of any erosion and sediment control measures;	Adequate – Proponent satisfactorily addressed ENR questions on management response during the construction phase related to sediment discharge including sampling locations and frequencies, action levels and proposed response actions. Proponent also agreed with recommendation that sediment limits in discharge water should reflect CCME guidelines for Total Particulate Matter.
m)	A summary of risks to Water quality and associated mitigation;	Adequate – background information is included in the Plan as required.
n)	A summary of risk to fish, fish habitat, associated mitigation, salvage, timing, and minimization or avoidance of physical habitat impacts;	Adequate – background information is included in the Plan as required. DFO provided assistance in preparing work plan and had no issues with the proposed activity.
o)	The details for Water management and monitoring including details on the selected drawdown and dewatering method, daily flow rates and monitoring requirements;	Adequate – Plan references details in Construction Monitoring and Verification Plan (approved by Board on August 3, 2017).
p)	The details of how the monitoring program will assess channel performance;	Adequate – background information is included in the Plan as required.
q)	The details of how the monitoring program will confirm design assumptions; and	Adequate – background information is included in the Plan as required.
r)	A contingency plan outlining measures to be implemented should sediment and erosion levels be greater than expected.	Adequate – background information is included in the Plan as required. Discharge flow would be reduced or relocated to an outwash basin.

5. Reviewer Comments

By October 4, 2017, comments and recommendations on the Plan were received from the following reviewers:

- Environment and Climate Change Canada;
- Fisheries and Oceans Canada; and
- Government of the Northwest Territories – Environment and Natural Resources.

DIAND-CARD submitted its responses on October 11, 2017. The Review Summary and Attachments (attached) presents the comments, recommendations, and responses identified through the review of the Plan. On October 16, 2017, and in response to GNWT-ENR's comment ID 1 regarding the diversion of water into a holding pond, DIAND-CARD clarified in an email that no holding pond would be constructed as this activity is now planned to occur during frozen conditions (attached).

6. Security

Not applicable.

7. Conclusion

Board staff conclude that the Channel Design and Reconstruction Plan complies with requirements under Water Licence MV2016L8-0004.

8. Recommendation

Board staff recommend the Board approve the Channel Design and Reconstruction Plan, Rev. 3, as an interim submission and requires the submission of a revised Plan. The revised Plan will be considered approved, and construction may commence, upon written confirmation of conformity from Board staff.

Revisions shall include the following:

- For-construction drawings, signed and stamped by a Professional Engineer, as required by Part D, item 12 and Schedule 2, item 4(e) of Licence MV2016L8-0004, prior to construction on the channel project;
- A description of how construction will be limited to months of reduced flow in Bullmoose Creek (i.e. September to April) (GNWT comment IDs 1, 4, 5); and
- An explanation of how Total Particulate Matter monitored values will be compared to Canadian Council of Ministers for the Environment (CCME) guidelines for Total Particulate Matter and reported on in SNP Reports (GNWT comment IDs 6 and 7).

Board staff recommend the Board include the following text in the decision letter:

- The Board directs DIAND-CARD to adhere to commitments made in their responses to reviewer comments in the Reviewer Comment Summary Table.

9. Attachments

- Bullmoose Creek Channel Design and Reconstruction Plan – September 15, 2017
- Review Comment Table and Attachments
- Email from DIAND-CARD – October 16, 2017
- Draft Decision Letter from the Board

Respectfully submitted,

David Finch
Regulatory Specialist

Review Comment Table

Board:	MVLWB
Review Item:	INAC-CARD - Bullmoose-Ruth Remediation Project - Bullmoose Creek Channel Design and Reconstruction Plan (MV2016L8-0004)
File(s):	MV2016L8-0004
Proponent:	INAC - Contaminants and Remediation Directorate
Document(s):	MV2016L8-0004 - DIAND-CARD - Bullmoose Creek Channel Design and Reconstruction Plan Sep15_17 (3.2MB)
Item For Review Distributed On:	Sep 15 at 16:52 Distribution List
Reviewer Comments Due By:	Oct 4, 2017
Proponent Responses Due By:	Oct 11, 2017
Item Description:	Indigenous and Northern Affairs Canada - Contaminants and Remediation Division has submitted the Bullmoose Creek Channel Design and Reconstruction Plan, in accordance with Part D, Item 12 of Water Licence MV2016L8-0004. The Plan is required to comply with Schedule 2, Item 4 of the Licence. Reviewers are invited to submit questions, comments, and recommendations on this Plan using the Online Review System (ORS) by the review comment deadline specified below. All documents that have been uploaded to this review are also available on our public registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below.
General Reviewer Information:	This review item has also been distributed by fax to the following organizations: Fort Resolution Métis Council Trudy King (867)394-3322; Fieldworker.frmc53@northwestel.net; Hay River Metis Council Trevor Beck President (867)874-4472; hrmc@northwestel.net; NWT Metis Nation Tim Heron NWTMN IMA Coordinator (867)872-3586; rcc.nwtmn@northwestel.net;
Contact Information:	Jen Potten 867-766-7468 Julian Morse 867-766-7453

Comment Summary

Environment and Climate Change Canada: Gabriel Bernard-Lacaille				
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**	**Board Staff Analysis**
1	General	**Comment** ECCC has reviewed in accordance with its mandate and doesn't have any comments at this time. **Recommendation** Not applicable.	**Oct 11:** Thank you for your review and comment.	Noted.
Fisheries and Oceans Canada: Laura Phalen				
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**	**Board Staff Analysis**
1	Fisheries and Oceans Canada Review	**Comment** As mentioned in the cover letter associated with "Bullmoose Creek Channel Design and Reconstruction Plan," these work plans were finalized with input from Fisheries and Oceans Canada (DFO). After concerns were addressed, DFO issued a Letter of Advice (17-HCAA-00427). A DFO representative has reviewed this version of the work plan and finds no inconsistencies with the plans that were reviewed and considered in the generation of the Letter of Advice. Therefore, DFO has no further concerns or recommendations associated with the designs and plans described in this document. **Recommendation** No recommendations from DFO.	**Oct 11:** Thank you for your review and comment.	Noted.
GNWT - ENR: Central Email GNWT				
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**	**Board Staff Analysis**
8	General File	**Comment** (doc) ENR Letter with Comments and Recommendations		Noted.

1	Topic 1: Aquadam Installation	**Comment** It is noted within Section 3.0 that an aquadam will be installed to facilitate the excavation of the impacted sediment zone. As a component of this, it is noted that a temporary pool will be excavated upstream to allow for installation of the aquadam. ENR is not clear on the necessity or the magnitude of the proposed temporary pool. It is our understanding that during aquadam utilization, flows can often be diverted around the work area to achieve dry conditions without the need for a temporary pool. This could be achieved by pumping the isolated water (potentially containing high TSS) through a filter sock onto a vegetated area. There would be some initial costs for the filter sock but this would remove the requirement to construct and then remediate a holding pond full of water. If the contractor does decide to go with a holding pond, ENR would like to confirm the required volume of this pool. The stated dimensions (15m x 15m by 1m) result in a volume of 225,000l, not 30,000l as stated. If 30,000 l is the required maximum capacity for the diversion, a significantly smaller holding pond could be constructed. Additionally, Bullmoose Creek appears relatively shallow during freshet conditions and would likely contain even less water when work would be completed. INAC CARD	**Oct 11:** A small sump will be constructed upstream of the aquadam, and bypass pumps will be operated during Creek reconstruction, with discharge back to the Creek channel downstream of the reconstructed section to a check dam. TSS is not expected to be significant through construction in ponded/pumped water, and erosion and sediment control measures including a turbidity curtain at the Creek mouth, will be in place and have been proved effective in other applications. Once the reconstruction is complete, the reconstructed channel will be sequentially hydrated from downstream to upstream while erosion and sediment control measures are maintained, as some wash out of fines from creekbed materials is expected, and then the bypass to the sump will be removed, the aquadam will be removed, and the channel will gradually fill (flows are small). Once flows are clear, the erosion and sediment control measures will be removed. **Oct 16:** It looks like a math error in the text of the plan, ie. someone was trying to back-calculate from 30,000l to get the dimensions. The volume is correct, the dimensions are wrong. The correct dimensions should be ~5.5m x ~5.5m x 1m, which is approximately 30,000l (30,250l, exactly). This is likely now a moot point, as now all	Satisfactory response. The Licence specifically authorizes CARD to construct a dam for diversion, so identifying alternatives was not strictly necessary. Construction season has been changed to winter low-flow periods so the dam and retention pond will no longer be necessary.

		(CARD) should verify the volumes required comparing the pond size and the isolated site in addition to continual sump water that will also be going into the pond over the duration of the isolated work. Furthermore, ENR requests additional information detailing how water will drain out of the holding pond and an outline of any plans to remediate the area upon project completion. Finally, if the pool is in fact required the specific location of this excavation is not clear. An approximate location is denoted on Figure BM 4-1 but specific details are not included regarding location and ground type. **Recommendation** 1) ENR requests that CARD consider alternatives for the diversion of Bullmoose Creek that would eliminate the excavation of the holding pond.	construction will be under frozen conditions, or flows so low that they do not have to be diverted. We will not be constructing a holding pond going forward.	
2	None	**Comment** None **Recommendation** 2) Should a holding pond still be the preferred option, ENR requests information detailing how water will drain out of the holding pond (e.g. aggregate filter, check dams, etc) and how the area will be remediated.	**Oct 11:** As noted above, the bypass to the sump will be removed, remaining water will be pumped around the reconstructed channel as it has been, and then the sump will be backfilled. **Oct 16:** This is likely now a moot point, as now all construction will be under frozen conditions, or flows so low that they do not have to be diverted. We will not be constructing a holding pond going forward.	Satisfactory response.

3	None	**Comment** None **Recommendation** 3) ENR recommends that additional rationale and clarification be provided on the size, location and ground type in the area	**Oct 11:** As Built drawings of the reconstructed creek will be provided in the project Annual Remediation Report.	High-level information on the pre-existing environment is provided in Section 2.2 of Plan. The reference to the "Annual Remediation Report" is not a requirement of the Licence. It refers to the Annual Water Licence Report which does require the type of information that the proponent is discussing.
4	Topic 2: Timing	**Comment** In the previous comment, ENR has raised concerns regarding construction of temporary holding ponds which is linked to the amount of water that will be managed during stream diversion. This water amount is directly linked to the timing of the undertaking, as stream diversions are preferably done under low flow conditions to minimize the amount of water on site. Fish habitat assessment and other flow measurements for Bullmoose Creek appear to have been done in May and July so it isn't clear as to conditions that may be present later in the year (late summer when work is proposed). ENR notes that timing of the excavation work is slated for August (Section 3.5.1) however Section 3.1 notes that higher	**Oct 11:** Low flow conditions have been observed throughout Bullmoose Creek throughout the fall. The aquadam is intended to be installed on a precautionary basis, but will likely not be required, as the small 2m x 2m sump and bypass pumping will be more than adequate for the observed flow. **Oct 16:** This is likely now a moot point, as now all construction will be under frozen conditions, or flows so low that they do not have to be diverted. We will not be constructing a holding pond going forward.	Satisfactory response. Anticipated and peak volumes are listed in Section 2.2 of the report are adequate. The work plan has now been shifted to winter, the period of lowest flow, and retention/diversion is no longer planned.

		precipitation periods in this area typically occur in late summer. Furthermore, mitigations outlined in Section 3.5.1 include "conduct in-water activities during dry periods when low flows are anticipated (to reduce the risk of downstream sediment transport during in-water works)." It isn't clear if the proposed timing of the excavation of a watercourse is during a low flow period. **Recommendation** 1) ENR requests additional information from CARD on anticipated water levels during the proposed work period (August) and how this relates to low flows.		
5	None	**Comment** None **Recommendation** 2) ENR recommends that work related to Bullmoose Creek be carried out during low flow or frozen conditions to minimize impacts to the receiving environment.	**Oct 11:** See comment above - flows have been low to negligible (less than 1 to a few L per sec) throughout the fall. **Oct 16:** [All] construction will be under frozen conditions, or flows so low that they do not have to be diverted. We will not be constructing a holding pond going forward.	Satisfactory response. Board staff recommend that construction activity be limited to periods of lowest flow (i.e. August/September and into winter).
6	Topic 3: Monitoring	**Comment** It is noted in the application that as "(p)er the Construction Monitoring Plan (CMP) (Stantec 2017b), during the construction monitoring phase, should sediment discharge be identified as a risk to water quality in Bullmoose Lake, the discharge flow will be reduced or the discharge point may be relocated." Section 3.6.1 expands upon this by stating that construction activity monitoring will occur in Bullmoose Lake, to confirm	**Oct 11:** There are four monitoring locations in Bullmoose Lake, as outlined in the Construction Monitoring and Verification Plan (CMVP), which have been monitored as part of the Surveillance Network Program (SNP) since the start of summer construction in June. Monitoring results are provided in monthly SNP Reports. TSS monitoring was added to the monitoring program in August, per the Adaptive Management Plan	Satisfactory response. Monitoring to be conducted at multiple SNP locations. ENR recommendation regarding use of CCME guidelines for Total Particulate Matter are addressed in (7) below.

		that construction activities are not resulting in new impacts (CMP Section 5.2.3.1, SNP 2016-10). Should sediment discharge to Bullmoose Lake be identified, then the responses (per the CMP) are to firstly reduce discharge flows, and secondly to relocate the discharge. Section 3.6.4 notes that "(s)hould the level of solids in the surface water sampled exceed those within Bullmoose Lake, the discharge flow rate will be adjusted and/or the discharge location will be relocated." Specifics related to monitoring locations or how baseline in Bullmoose Lake will be determined are not clear. It is assumed that monitoring will occur in Bullmoose Lake and this will in essence become a criterion that discharge water is not to exceed. ENR notes that Bullmoose Lake water will likely be of high clarity/low TSS so using background conditions as a TSS limit may not be practical. A more appropriate limit may be the CCME guideline for Total Particulate Matter which recommends a maximum increase of 25 mg/L from background levels for any short-term exposure (24 hrs) and 5 mg/L for longer term exposures (e.g. inputs lasting from 24 hrs to 30 days). **Recommendation** 1) ENR requests that CARD clarify the methods for management response related to sediment	(AMP) section of the CMVP, for Bullmoose Lake stations. This was in response to an identified increase in metals concentrations at station BullLake1 in July, which is at the outlet of the Bullmoose Portal Wetland, north of Bullmoose Creek. Station BullLake3 is just south of the Bullmoose Creek mouth, while BullLake4 is further south. September monitoring of these stations was completed, and should further triggers under the AMP be experienced, the actions outlined in the CMVP will be taken.	

		discharge including sampling locations and frequencies, action levels and proposed response actions.		
7	None	**Comment** None **Recommendation** 2) ENR recommends a that a TSS limit for discharge water should reflect CCME guidelines for Total Particulate Matter which are a maximum increase of 25 mg/L from background levels for any short-term exposure (24 hrs) and 5 mg/L for longer term exposures (e.g. inputs lasting from 24 hrs to 30 days).	**Oct 11:** Stantec agrees that the CCME guideline for total particulate matter pertaining to short-term and long-term exposures (up to 30 days) are relevant and applicable to monitoring the effects of Bullmoose Creek reconstruction on Bullmoose Lake, and will include comparison to these guidelines in the September and October SNP Reports.	Satisfactory response.

David Finch

From: David Finch
Sent: October 16, 2017 10:54 AM
To: 'Testart, Tawanis (AADNC/AANDC)'
Cc: Breadmore, Ron (AADNC/AANDC)
Subject: RE: MV2016L8-0004 - Bullmoose Creek CDRP - response to comments

Hi Tawanis. Yes, that does address it. I'll update the information on file accordingly.

Thanks,
David

David Finch, MES
Regulatory Specialist
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th St, P.O. Box 2130 | Yellowknife, NT | X1A 2P6
ph 867.766.7467 | fax 867.873.6610
dfinch@mvlwb.com | www.mvlwb.com

From: Testart, Tawanis (AADNC/AANDC) [mailto:tawanis.testart@canada.ca]
Sent: October 16, 2017 10:07 AM
To: David Finch <dfinch@mvlwb.com>
Cc: Breadmore, Ron (AADNC/AANDC) <ron.breadmore@canada.ca>
Subject: RE: MV2016L8-0004 - Bullmoose Creek CDRP - response to comments

Hi David,

It looks like a math error in the text of the plan, ie. someone was trying to back-calculate from 30,000l to get the dimensions. The volume is correct, the dimensions are wrong. The correct dimensions should be ~5.5m x ~5.5m x 1m, which is approximately 30,000l (30,250l, exactly). This is likely now a moot point, as now all construction will be under frozen conditions, or flows so low that they do not have to be diverted. We will not be constructing a holding pond going forward.

Does that answer your questions satisfactorily?

Thanks,

Tawanis Testart
Project Officer/Agente de projet
Tel: (867) 669-2443
INAC Contaminants and Remediation Division
P.O. Box 1500

4923-52nd Street
Yellowknife, NT X1A 2R3

From: David Finch [mailto:dfinch@mvlwb.com]
Sent: October-13-17 11:59 AM
To: Testart, Tawanis (AADNC/AANDC)
Subject: MV2016L8-0004 - Bullmoose Creek CDRP - response to comments

Hello Tawanis. I am following up on CARD's response to the reviewers' comments on the Bullmoose Creek Channel Design and Reconstruction Plan. I've been able to reconcile most of the comments, but I have one outstanding item that I'm hoping that you can help answer. It was not directly addressed in the response.

> **ID 1**
> **Topic 1: Aquadam Installation**
> "If the contractor does decide to go with a holding pond, ENR would like to confirm the required volume of this pool. The stated dimensions (15m x 15m by 1m) result in a volume of 225,000l, not 30,000l as stated. If 30,000 l is the required maximum capacity for the diversion, a significantly smaller holding pond could be constructed."

I am just checking if the 30,000 L volume as stated in the Plan is correct and as intended. If so, do you have any additional response to the comment in terms of the required capacity?

Thank you,
David

David Finch, MES
Regulatory Specialist
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th St, P.O. Box 2130 | Yellowknife, NT | X1A 2P6
ph 867.766.7467 | fax 867.873.6610
dfinch@mvlwb.com | www.mvlwb.com

October 4th, 2017

Jen Potten
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Potten,

Re: INAC CARD
Water Licence – MV2016L8-0004
Bullmoose Remediation Project
Bullmoose Creek Channel Design and Reconstruction Plan
Request for Comments

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the plan at reference based on its mandated responsibilities under the *Environmental Protection Act,* the *Forest Management Act*, the *Forest Protection Act, the Species at Risk (NWT) Act, the Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

Topic 1: Aquadam Installation

Comment(s):

It is noted within Section 3.0 that an aquadam will be installed to facilitate the excavation of the impacted sediment zone. As a component of this, it is noted that a temporary pool will be excavated upstream to allow for installation of the aquadam. ENR is not clear on the necessity or the magnitude of the proposed temporary pool. It is our understanding that during aquadam utilization, flows can often be diverted around the work area to achieve dry conditions without the need for a temporary pool. This could be achieved by pumping the isolated water (potentially containing high TSS) through a filter sock onto a vegetated area. There would be some initial costs for the filter sock but this would remove the requirement to construct and then remediate a holding pond full of water.

If the contractor does decide to go with a holding pond, ENR would like to confirm the required volume of this pool. The stated dimensions (15m x 15m by 1m) result in a volume of 225,000l, not 30,000l as stated. If 30,000 l is the required maximum capacity for the diversion, a significantly smaller holding pond could be constructed. Additionally, Bullmoose Creek appears relatively shallow during freshet conditions and would likely contain even less water when work would be completed. INAC CARD (CARD) should verify the volumes required comparing the pond size and the isolated site in addition to continual sump water that will also be going into the pond over the duration of the isolated work.

Furthermore, ENR requests additional information detailing how water will drain out of the holding pond and an outline of any plans to remediate the area upon project completion.

Finally, if the pool is in fact required the specific location of this excavation is not clear. An approximate location is denoted on Figure BM 4-1 but specific details are not included regarding location and ground type.

Recommendation(s):

1) ENR requests that CARD consider alternatives for the diversion of Bullmoose Creek that would eliminate the excavation of the holding pond.

2) Should a holding pond still be the preferred option, ENR requests information detailing how water will drain out of the holding pond (e.g. aggregate filter, check dams, etc) and how the area will be remediated.

3) ENR recommends that additional rationale and clarification be provided on the size, location and ground type in the area.

Topic 2: Timing

Comment(s):

In the previous comment, ENR has raised concerns regarding construction of temporary holding ponds which is linked to the amount of water that will be managed during stream diversion. This water amount is directly linked to the timing of the undertaking, as stream diversions are preferably done under low flow conditions to minimize the amount of water on site. Fish habitat assessment and other flow measurements for Bullmoose Creek appear to have been done in May and July so it isn't clear as to conditions that may be present later in the year (late summer when work is proposed).

ENR notes that timing of the excavation work is slated for August (Section 3.5.1) however Section 3.1 notes that higher precipitation periods in this area typically occur in late summer. Furthermore, mitigations outlined in Section 3.5.1 include "conduct in-water activities during dry periods when low flows are anticipated (to reduce the risk of downstream sediment transport during in-water works)." It isn't clear if the proposed timing of the excavation of a watercourse is during a low flow period.

Recommendation(s):

1) ENR requests additional information from CARD on anticipated water levels during the proposed work period (August) and how this relates to low flows.

2) ENR recommends that work related to Bullmoose Creek be carried out during low flow or frozen conditions to minimize impacts to the receiving environment.

Topic 3: Monitoring

Comment(s):

It is noted in the application that as "(p)er the Construction Monitoring Plan (CMP) (Stantec 2017b), during the construction monitoring phase, should sediment discharge be identified as a risk to water quality in Bullmoose Lake, the discharge flow will be reduced or the discharge point may be relocated."

Section 3.6.1 expands upon this by stating that construction activity monitoring will occur in Bullmoose Lake, to confirm that construction activities are not resulting in new impacts (CMP Section 5.2.3.1, SNP 2016-10). Should sediment discharge to Bullmoose Lake be identified, then the responses (per the CMP) are to firstly reduce discharge flows, and secondly to relocate the discharge. Section 3.6.4 notes that "(s)hould the level of solids in the surface water sampled exceed those within Bullmoose Lake, the discharge flow rate will be adjusted and/or the discharge location will be relocated."

Specifics related to monitoring locations or how baseline in Bullmoose Lake will be determined are not clear. It is assumed that monitoring will occur in Bullmoose Lake and this will in essence become a criterion that discharge water is not to exceed. ENR notes that Bullmoose Lake water will likely be of high clarity/low TSS so using background conditions as a TSS limit may not be practical. A more appropriate limit may be the CCME guideline for Total Particulate Matter which recommends a maximum increase of 25 mg/L from background levels for any short-term exposure (24 hrs) and 5 mg/L for longer term exposures (e.g. inputs lasting from 24 hrs to 30 days).

Recommendation(s):

1) ENR requests that CARD clarify the methods for management response related to sediment discharge including sampling locations and frequencies, action levels and proposed response actions.

2) ENR recommends a that a TSS limit for discharge water should reflect CCME guidelines for Total Particulate Matter which are a maximum increase of 25 mg/L from background levels for any short-term exposure (24 hrs) and 5 mg/L for longer term exposures (e.g. inputs lasting from 24 hrs to 30 days).

Comments and recommendations were provided by ENR technical experts in the Water Resources Division and the North Slave Region, and were coordinated and collated by the Environmental Assessment and Monitoring Section, Conservation, Assessment and Monitoring Division (CAM).

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email patrick_clancy@gov.nt.ca.

Sincerely,

Patrick Clancy
Environmental Regulatory Analyst
Environmental Assessment and Monitoring Section
Conservation, Assessment and Monitoring Division
Department of Environment and Natural Resources
Government of the Northwest Territories