

**CONSORTIUM**



1032, 3<sup>rd</sup> Ave., Val d'Or, QC, J9P 1T6

Ref. no.: 115726.003-601

# REPORT

## SOCIÉTÉ DE DÉVELOPPEMENT DE LA BAIE-JAMES

Construction of a steel arch structure at km 19.8  
of LA1 Road to the Laforge 1 Dam

Application for exemption from the environmental assessment  
process under Section 154 of the Environment Quality Act

AUGUST 2018



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**Norda Stelo / Stantec**

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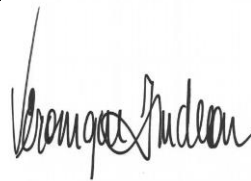
Société de développement de la Baie-James

Construction of a steel arch structure at km 19.8 of LA1 Road to the  
Laforge 1 Dam

Ref. no.: 115726.003-601

Application for exemption from the environmental assessment process under  
Section 154 of the Environment Quality Act

Prepared by:



Véronique Trudeau, M. Sc., Biologist

Approved by:



Vital Boulé, M. Sc., Biologist  
Project Manager, Environment

August 27, 2018



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# 1 PROJECT PROPONENT

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|   |   |  |
|---|---|--|
| <b>Name:</b>  | <i>Société de développement de la Baie-James (SDBJ)</i> |  |
| <b>Civic address:</b>   | 110 Matagami Blvd., P.O. Box 970                        |  |
|   | Matagami, Québec J0Y 2A0                                |  |
| <b>Postal address<br/>(if different):</b>   |   |  |
| <b>Telephone:</b>   | 819-739-4717  |  |
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| <b>E-mail:</b>  | rthibault@sdbj.gouv.qc.ca                               |  |
| <b>Project manager:</b>   | Raymond Thibault  |  |
| <b>Mandatory: Quebec Enterprise Number (NEQ) from the<br/>Registraire des entreprises du Québec</b> | Not applicable  |  |

## 2 CONSULTANT COMMISSIONED BY THE PROJECT PROPONENT

|   |   |  |
|---|---|--|
| <b>Name:</b>  | Norda Stelo / Stantec Consortium                          |  |
| <b>Civic address:</b>   | 1032, 3 <sup>rd</sup> Avenue<br>Val-d'Or (Québec) J9P 1T6 |  |
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| <b>Facsimile:</b>   | 418 654-9699  |  |
| <b>E-mail:</b>  | anne-marie.leclerc@norda.com                              |  |
| <b>Project manager:</b>   | Anne-Marie Leclerc, M. Sc., geomorphologist               |  |
| <b>Mandatory: Quebec Enterprise Number (NEQ) from the Registraire des entreprises du Québec</b> | 3373097636  |  |

### 3 PROJECT TITLE

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Construction of a steel arch structure at km 19.8 of LA1 Road to the Laforge 1 Dam.

### 4 PROJECT OBJECTIVES AND JUSTIFICATION

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#### 4.1 Objective

The objective of this application is to obtain an exemption from section 154 of the Environment Quality Act (EQA) from the *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques* (MDDELCC) for the construction of a steel multi-plate arch structure at km 19.8 of the LA1 Road to the Laforge 1 Dam.

The following sections present information relating to an application for exemption for such a project. All the information required in the "*Preliminary information on a project in a northern region*" form (September, 2016 version) is included in this report.

#### 4.2 Applicable Regulatory Framework

In conformance with section 154 of the EQA, any project proponent wanting to carry out a project in a northern region<sup>1</sup> who is neither subject to (Appendix A to the de la EQA) nor specifically exempted from the environmental assessment procedure (Appendix B to the EQA) must first apply for an exemption from the MDDELCC. Construction or reconstruction on an existing road, which is the subject of this project, is an activity that falls in the "grey area".

It should be noted that a waiver request relative to section 92 of the Regulation respecting the sustainable development of forests and a *Demande de permis d'intervention en milieu forestier* were submitted to the MFFP on July 12 and August 2, 2018, respectively. The waiver request has already been approved for the work to be carried out in the fish habitat after September 15, i.e., outside the periods prescribed in Appendix 5 of the Regulation respecting the sustainable development of forests. A request for review by the Department of Fisheries and Oceans (DFO) is also being prepared and will be submitted shortly.

#### 4.3 Project Justification

There used to be a battery of six culverts in the stream under LA1 Road at km 19.8. An exceptionally high flood that occurred in the late spring of 2018 caused the battery of culverts to give way. They were completely swept away by the current, and the road collapsed (see Appendix 4.1). A temporary bridge

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<sup>1</sup> Territory subject to the James Bay and Northern Quebec Agreement (JBNQA); south of the 55<sup>th</sup> parallel.

was built on an urgent basis so as not to block the only access road to the Laforge 1 Dam (see Appendices 4.1 and 4.2), but this bridge is not designed to withstand major floods or winter conditions.

## 5 PROJECT LOCATION

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The project is located in the sprawling territory of the Eeyou Istchee-James Bay Municipality (Administrative Region no. 10), in an area subject to the James Bay and Northern Quebec Agreement (JBNQA). The map in Appendix 5.1 shows the location of the future arch.

The arch will be located at km 19.8 of the LA1 Road to the Laforge 1 Dam, at the following approximate central coordinates: 5 993 522 m N; 663 099 m E (NAD83, UTM zone 18).

## 6 DESCRIPTION OF THE PROJECT AND ITS ALTERNATIVES

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### 6.1 Project Description

Initially, the work will require relocation of the temporary emergency bridge to allow construction of the permanent structure in the axis of the existing road. The temporary bridge will be relocated  $\pm 5$  m (to be confirmed later during drawing and specification preparation). The temporary bridge will then remain in place during construction of the permanent arch, i.e., until the end of November, 2018.

In a second step, the steel multi-plate arch structure will be erected over the stream whose upper bank limit (equal to the bankfull discharge width, BDW) is estimated at about 13 metres. The arch opening will be approximately 19 metres. There will thus be no permanent encroachment within the bank limits since the arch footings and rip-rap protection will be located outside them. The footings will, however, be partially under the high water mark (HWM), estimated to be 20 m wide.

The steps needed to install the permanent structure essentially consist of:

- Preparing the footings for the proposed structure;
- Installing the prefabricated arch and lattice walls;
- Backfilling the footings;
- Placing protective rip-rap (rock of a minimum size of 300-500 mm);
- Raising the level of the existing road at the arch approaches ( $\pm 3.4$  m). The rise will slope off gradually away from the arch until it meets the existing LA1 Road profile, approximately 80 m on either side of the arch.

Lastly, when construction is finished, the temporary bridge will be dismantled. The disturbed banks will be stabilized. The stream bed will be profiled to restore the natural characteristics and bankfull discharge width it had prior to construction. The culverts carried downstream by the current will be recovered by the contractor who will be responsible for disposing of them.

The shop drawings, work methods and equipment will be determined by the contractor. Specifications will be produced, including specifications for protection of the environment, and the site supervisor will ensure they are respected. The usual machinery will be employed (crane, hydraulic excavator, dump trucks, compactors, etc.).

Since the supplier's final shop drawings were not available at the time this document was submitted, a preliminary sketch of the planned structure is provided in Appendix 6.1. The design of the new structure will meet the standards and criteria indicated in the following reference documents:

- Regulation respecting the sustainable development of forests, published by the *ministère des Forêts, de la Faune et des Parcs du Québec* (MFFP);
- *Ouvrages routiers, Tome III – Ouvrages d'art* standards, published by the *ministère des Transports, de la Mobilité durable et de l'Électrification des transports* (MTMDET)<sup>2</sup>;
- *Manuel de conception hydraulique des ponts*, published by the MTMDET<sup>3</sup>;
- Canadian Highway Bridge Design Code, published by the Canadian Standards Association (CSA Group)<sup>4</sup>.

According to the hydraulic analysis performed for construction of the proposed structure, the following criteria were used for the hydraulic design of the replacement structure:

- Structure with a rideable width of 8 metres;
- Arch span: about 19 metres;
- Arch length > 80% of the thalweg length of the segment disturbed by construction;
- 75-year flood design increased by 20% to take climate change into account;
- Opening (14.0 m horizontal clearance) with a minimum width equal to the BDW (13.6 m) at the crossing, perpendicular to the longitudinal axis of the stream;
- No reduction in the stream width with respect to the upper bank limit;
- Minimal requirement of 300 mm freeboard over the design high water (DHW) or  $\geq 15\%$  of the water depth at the upstream face of the structure (the larger of the two values), considering that the stream is not used for navigation and there is no significant jam formation potential;
- No structure encroachment in the stream bed (bottom and banks);

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<sup>2</sup> MTMDET. Tome III – Ouvrages d'art, 2017. *Les Publications du Québec, collection Normes – Ouvrages routiers*.

<sup>3</sup> Ministère des Transports du Québec, 2005. *Manuel de conception hydraulique des ponts. Direction des structures. Les Publications du Québec*.

<sup>4</sup> Groupe CSA/Association Canadienne de Normalisation, 2017. CAN-CSA S6-F06: *Code canadien sur le calcul des ponts routier*, 11<sup>th</sup> edition. Canadian National Standard

- Adequate protection of walls, footings and foundations with flood-resistant rip-rap;
- 17.5 degree bias for the structure opening at the level of the footings, since this structure is rectilinear;
- Minimum soffit elevation of 430.34 m to ensure that the design high water line, estimated to be 430.01 m, is less than or equal to 85% of the structure freeboard;
- Maximum potential washout depth at the stream bed: 0.59 metres. The potential washout depth at the base of the abutment varies from 0.25 and 0.37 metres;
- Replacement structure extremities protected with 300-500 mm rip-rap 800 mm thick, placed up to 430.31 metres elevation. From there, a 500 mm thickness of 200-300 mm rip-rap will be placed;
- The rip-rap protection should not reduce the flow section under the structure beyond the existing state at the bridge (flow section area of 13.52 m<sup>2</sup>, under elevation 429.60 m);
- Residual fill material from the old culvert that is impeding the stream will be removed to restore the stream to a more natural flow section and to allow for placement of the protective rip-rap without obstructing the flow;
- Protective rip-rap at the approaches to the new structure will be extended to the limit of the construction work to stabilize the banks.

## 6.2 Alternatives Analyzed

SDBJ evaluated the project alternatives shown in Table 6.1 to replace the old culvert battery at km 19.8 of the LA1 Road. In all three cases, the structure designs were based on a 75-year useful life.

**Table 6.1 Project alternatives**

| Project alternative                 | Construction Period                      |
|-------------------------------------|--|
| 1. Steel multi-plate arch structure | Start of October to end of November 2018 |
| 2. Concrete arch culvert            | Mid-November to mid-December 2018        |
| 3. Steel & concrete bridge          | June to mid-July 2019                    |

Construction of a steel & concrete bridge (option 3) cannot be planned this fall due to design and construction delays, and construction of such a bridge would therefore be postponed until the summer of 2019. To keep traffic flowing all year until reconstruction, the existing temporary bridge would nevertheless need to be demolished and rebuilt this fall with a wider opening over the stream (beyond the upper banks) to comply with environmental requirements and accommodate spring hydraulic conditions.

The advantage of the first two project alternatives (options 1 and 2 – prefabricated arches) is the fact that they allow construction to be carried out this fall while allowing traffic to continue via the existing temporary bridge. But uncertainties with regard to fabrication of the concrete arch culvert (option 2) might result in a delay in the start of its installation.

In light of this information, the steel multi-plate arch structure option (option 1) was chosen since it would result in the shortest construction time. Shorter construction time is also an advantage from an environmental point of view (shorter disturbance period).

## 7 ENVIRONMENTAL COMPONENTS AND MAIN PROJECT CONSTRAINTS

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### 7.1 Natural Environment

The section of the LA1 Road affected by the project is located in boreal forest, in the lichen spruce bioclimatic domain. According to Northern Quebec eco-forestry chart data, the west bank is composed of softwood stands on a bed of lichens and mosses with a 26 to 40% cover density. Surface deposits are of glacial origin. The east bank is occupied by softwood stands on a bed of lichens and mosses or mosses and ericaceous shrubs with a cover density varying from 10 à 40%. The stands on both banks are at a more than 95-year development stage.

Ducks Unlimited's detailed wetlands cartography does not cover the Northern Quebec administrative region, but a number of minerotrophic peatlands can be distinguished through photo-interpretation (shown in brown in Figure 7.1). Northern Quebec eco-forestry chart data also identify these fens. In light of this data, there will be no peatland encroachment.

The stream that flows under the LA1 bridge has no official name in the MDDELCC registers. It is located in the La Grande Rivière natural watershed, which covers an area of 97,600 km<sup>2</sup>. The area of the watershed of the stream in question itself is about 62 km<sup>2</sup>.

The land was surveyed on July 1, 2018, to determine the upper width of the banks, the thalweg elevation, and the HWM. The crossing site was characterized based on these surveys and photos. Generally speaking, the stream in question presents riffles and pools type facies, but nevertheless forms a cascade immediately upstream from the crossing. The cascade is associated with a slope break with an average inclination on the order of 2.7% over approximately 90 metres. The longitudinal slope of the stream at and downstream from the crossing is very shallow and locally negative. It is estimated to be 0.2% at about 100 m downstream from the crossing.

At the crossing site itself, there is a riffle type flow facies and the substrate mainly consists of cobble, blocks, and pebbles. The upper bank limit width (bankfull discharge width or BDW) is 13.6 m and the HWM is about 20 metres wide. The average and maximum water depths during the surveys were 0.4 m and 0.8 m, respectively.





**Figure 7.1**      **Satellite image of the natural environment at the LA1 bridge crossing site (source: Google Earth)**

This stream is located within the La Grande River catchment basin that contains several fish species, including brook trout, northern pike, lake trout, lake whitefish, etc. Fish species potentially present in the stream are brook trout and northern pike. Pike can mainly be found in the calmer flow zones upstream and downstream from the crossing site, but brook trout use the faster flow sections such as those observed directly at the crossing site.

Given the prevailing hydraulic conditions at the crossing site, the primary fish species likely to use the habitat directly in the planned construction area are the brook trout, white sucker, and northern sucker. At the crossing site, the stream is mainly used for feeding and as a transit corridor between some lakes and ponds located downstream and upstream from the site. The primary function of the habitat immediately at the crossing site is feeding and migration for the brook trout.

There are no regulated wildlife habitat near the construction site, and the stream crossing site is not included in any protected area recorded in the MDDELCC registry.



## 7.2 Human Environment

The LA1 Road is the only roadway link to the Laforge 1 Dam. According to the James Bay and Northern Quebec Agreement, the work site is located in Category III lands, i.e., free public territory with no exclusive usage by indigenous communities.

Reconstruction of the LA1 road at km 19.8 will have no impact on neighbouring community hunting and fishing rights. The site is located in the CH26 trapline where the tallyman is Bobby Pashagumeskum from the Chisasibi community. Moreover, there are no Cree camps located nearby or any other infrastructure other than the road itself. Apart from movement of persons (residents and vacationers), the road is mainly used by Hydro-Québec, which will be assuming the costs of construction.

Project implementation faces few constraints, other than administrative ones, because of the tight project schedule (design, material procurement, site mobilization, environmental authorizations, contractor phasing, construction, etc.). As a result, few constraints are anticipated for the work and activities covered by this application for exemption.

## 8 PRIMARY IMPACTS ANTICIPATED

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Since the work involves replacing a battery of culvert with a steel arch structure over an existing road, no additional impact is anticipated on the natural and human environments. In fact, the water flow and fish habitat conditions should be improved when this project is finished.

Free movement of fish will be ensured at all times during construction, and measures will be put in place to prevent and minimize downstream sediment transport. A portion of the structure's protective rip-rap will be located in fish habitat over about 15 m<sup>2</sup> due to the construction of the arch. However, the situation will be improved compared to the previous battery of six culverts and their backfill in place before being carried away. Construction of the 19-metre-span arch structure will result in a gain of habitat for the fish and will facilitate their free passage at all times compared to the old culvert array.

No indigenous rights or privileges will be infringed upon by construction of the structure in question. Since there are no encampments nearby, no noise nuisance is anticipated. Automobile traffic will only be improved compared to existing conditions.

The chosen option will also mean that the existing temporary bridge abutments will encroach into the stream for less time than would otherwise be the case with the project alternatives.

A number of measures will be included in specification 185 for protection of the environment during construction including, among others:

#### *Erosion and sediment transport control*

- Carrying out the work in minimum flow periods as much as possible;
- Putting in place effective measures to limit transport of sediment from the worksite into the aquatic environment, and maintaining them (e.g.: sediment barrier, berms, sediment trap, settling pond, temporary talus stabilization, diverting water toward areas of vegetation). These measures must remain effective during flood periods, heavy rains, and frost periods;
- Diverting upstream runoff before it reaches disturbed ground (e.g.: dissipation pit to areas of vegetation);
- Temporarily stabilizing and protecting disturbed ground that presents a risk of eroding and transporting sediment into the aquatic environment using methods adapted to the site, time until site closing, and period of the year;
- Disposing of cut and fill materials outside the HWM. If necessary, containing or stabilizing these materials (e.g.: impermeable tarp, sediment barrier) to prevent sediment transport into the aquatic environment;
- When work must be carried out in the water, isolating the work area so that the work can be done "in-the-dry", or limit sediment transport into the aquatic environment;
- Installing turbidity curtains<sup>5</sup> at each temporary bridge abutment to prevent transport of sediment into the stream when the temporary abutments are removed.

#### *Machinery movement and waste management*

- Ensuring that machinery will be working from the bank and will not cross into the stream. Intervention in the stream itself will be kept to a strict minimum;
- Ensuring that machinery is in good condition before it is used to prevent accidental leaks;
- Not cleaning machinery in or near the stream;
- Refuelling (filling up) vehicles and machinery more than 60 m away from a stream or drainage ditch, and in locations appropriate for the purpose;
- Immediately recovering any contaminant spilled in the environment;
- Permanently having on hand a complete petroleum product recovery kit to deal with small accidental spills, and ensuring that contaminated soil and materials are stored and recovered;
- Providing a place for properly identified watertight containers to hold waste and petroleum products;
- Placing cans or containers with hydrocarbons and other hazardous products in a tank or on a thick tarp large enough to collect any leaks;
- Disposing of waste in accordance with existing regulations;
- Prohibiting the burial of waste and scrap materials on the site;

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<sup>5</sup> Installing turbidity curtains is an MFFP requirement with regard to requests for waiver of section 92 for any work after September 15.

- Performing a general cleanup of the worksite on completion of construction;
- Not disposing of any debris in the aquatic environment. Any debris accidentally introduced shall be removed as soon as possible.

#### *Temporary structures*

- Ensuring sufficient water supply and circulation at all times to maintain fish habitat functions (feeding, fry rearing, spawning) downstream from the construction area. Taking steps needed to prevent impacts upstream and downstream from the work area (e.g.: flooding, dewatering, erosion, suspended particles);
- Using temporary bridges or crossing structures that minimize encroachment in fish habitat and ensure free passage of fish;
- Using clean aggregate for the construction of the road and temporary detour, excluding the riding surface and portions of the road situated above the HWM.

#### *Site restoration*

- Restoring the stream bed and banks of the aquatic environment impacted by the work (substrate grain size distribution, bed profile, etc.) following site demobilization on all the affected areas (temporary structures, accesses, etc.);
- Removing all equipment put in place during dismantling;
- Limiting rip-rapping of the littoral to the HWM;
- Restoring ditches damaged by machinery (flow slopes, talus shoulders, etc.).

## 9 PUBLIC INFORMATION AND CONSULTATION PROCESS

No consultations are planned as part of this project, since it will not change the existing and future use of this very low traffic road, which is occasional in time and space, and no indigenous rights or camps are impacted by the project. In terms of public information, adequate signage to warn road users will be used at the approach to the construction site. Traffic will be managed throughout the construction period. No other information or consultation measure appears to be necessary since road traffic will be maintained at all times during construction, apart from a short period needed to relocate the temporary bridge.

## 10 PROJECT SCHEDULE

Given the urgency of building a permanent structure before the 2019 spring flood, construction of this permanent work must inevitably be done in 2018. Given the time needed to approve the design, prepare drawings and specifications, produce shop drawings, fabricate the arch, mobilize the site, and obtain the

various environmental authorizations, construction work should begin in early October and continue until the end of November 2018. Most of the work will be performed outside the upper limits of the banks.

## 11 SUBSEQUENT PHASES AND RELATED PROJECTS

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Not applicable.

## 12 SIGNATURE OF APPLICANT

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I, Anne-Marie Leclerc, M.Sc., geomorphologist, in charge of execution in environment for the Consortium Norda Stelo / Stantec, certify that all the data provided in this preliminary information form are correct and to the best of my knowledge.



---

Anne-Marie Leclerc, M.Sc.,  
geographer -geomorphologist

August 27, 2018

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Date

Appendix 4.1  
SDBJ Photo Report





| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                                    |    |
|------------------------------------|----|
| Photo no.                          | 01 |
| Identification                     |    |
| Initial state of the site UPSTREAM |    |
| Comments                           |    |



|                           |    |
|---------------------------|----|
| Photo no.                 | 02 |
| Identification            |    |
| Initial state of the site |    |
| Comments                  |    |



|                                      |    |
|--------------------------------------|----|
| Photo no.                            | 03 |
| Identification                       |    |
| Initial state of the site DOWNSTREAM |    |
| Comments                             |    |





| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                           |    |
|---------------------------|----|
| Photo no.                 | 04 |
| Identification            |    |
| Initial state of the site |    |
| Comments                  |    |



|                    |    |
|--------------------|----|
| Photo no.          | 05 |
| Identification     |    |
| Upstream from road |    |
| Comments           |    |

Due to the presence of water, we chose to install the temporary bridge at the existing road level.



|                               |    |
|-------------------------------|----|
| Photo no.                     | 06 |
| Identification                |    |
| Installation of rock footings |    |
| Comments                      |    |





| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                |                               |
|----------------|-------------------------------|
| Photo no.      | 07                            |
| Identification | Installation of rock footings |
| Comments       |                               |



|                |                            |
|----------------|----------------------------|
| Photo no.      | 08                         |
| Identification | Installation of rock cages |
| Comments       |                            |



|                |  |
|----------------|--|
| Photo no.      | 09                                     |
| Identification | Filling of cages with 0-5 crushed rock |
| Comments       |  |





| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                   |    |
|-------------------|----|
| Photo no.         | 12 |
| Identification    |    |
| Deck installation |    |
| Comments          |    |



|                   |    |
|-------------------|----|
| Photo no.         | 13 |
| Identification    |    |
| Deck installation |    |
| Comments          |    |



|                   |    |
|-------------------|----|
| Photo no.         | 14 |
| Identification    |    |
| Deck installation |    |
| Comments          |    |




























| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                |   |
|----------------|---|
| Photo no.      | 15  |
| Identification | Backfill and compacting of footings at edges of decks |
| Comments       |   |



|                |       |
|----------------|-------|
| Photo no.      | 16    |
| Identification | Signs |
| Comments       |       |

| Croquis d'installation de signalisation pont temporaire km 19 LA-1 |                                     |  |   |   |
|--|-------------------------------------|--|---|---|
| LA1  |                                     |  |   |   |
|  |                                     | Gauche   |   | Droite  |
| 1 km du pont   | coté droit<br>t-30<br>sur 1 km      |                          |   | coté gauche<br>t-40<br>fin<br> |
| 850 m du pont  | p-140-1                             |                          |   | a mettre le panneau   |
| 700m du pont   | coté droit<br>t-70-1<br>maximun 50  |                          |  | coté gauche<br>t-70-1<br>maximun 70   |
| 300 m du pont  | t-70-1<br>maximun 30                |                          |   |   |
| 125m du pont   | td-210 - 1                          |                          |   |   |
| 100m du pont   |                                     |                          |   |   |
| 50m du pont  |                                     | t-70-1<br>maximun 10<br> |   |   |
| 40m du pont  | Balise en S<br>D-290-D<br>D-290-G   | p-200-2<br>              |   |   |
| 20 m du pont   |                                     | T-d 200<br>              |   |   |
| Pont   |                                     |  |   |   |
| 20 m du pont   | Balise en S<br>D-290-D<br>D-290-G   |  |  | T-d 200   |
| 40m du pont  |                                     |  |  | p-200-2   |
| 50m du pont  |                                     |  |  | t-70-1<br>maximun 10  |
| 100m du pont   |                                     |  |  |   |
| 125m du pont   |                                     |  |  | td-210 - 1  |
| 300 m du pont  |                                     |  |  | t-70-1<br>maximun 30  |
| 700m du pont   | coté gauche<br>t-70-1<br>maximun 70 |                          |  | coté droit<br>t-70-1<br>maximun 50  |
| 850 m du pont  |                                     |  |  | p-140-1   |
| 1 km du pont   | coté gauche<br>t-40<br>fin          |                          |  | coté droit<br>t-30<br>sur 1 km  |
| 5 km du pont   |                                     |  |  | coté droit<br>T-180<br>7,0m<br>T-245 p-3<br>5 km  |
| Entrée de LA1  |                                     |  |  | T-20<br>19km<br>               |
| Intersection RTT-LA1   |                                     |  |   |   |



| IDENTIFICATION                |   |
|-------------------------------|---|
| Case number: km 18.9 LA1 Road | Photographs taken by: Jean Nouvellet  |
| Date: 15/06/2018              |  |

|                |    |
|----------------|----|
| Photo no.      | 17 |
| Identification |    |
| Signage placed |    |
| Comments       |    |



|                |    |
|----------------|----|
| Photo no.      | 18 |
| Identification |    |
| Signage placed |    |
| Comments       |    |



|                      |    |
|----------------------|----|
| Photo no.            | 19 |
| Identification       |    |
| Guard rail installed |    |
| Comments             |    |



## Appendix 4.2

### Photo appendix





**Photo appendix of crossing site – km 19.8 bridge over La Forge-1 Road**



**Photo 1 Temporary bridge installed over stream (July 1, 2018)**



**Photo 2 View of upstream section of stream (July 1, 2018)**





**Photo 3 Upstream view from downstream (July 1, 2018)**



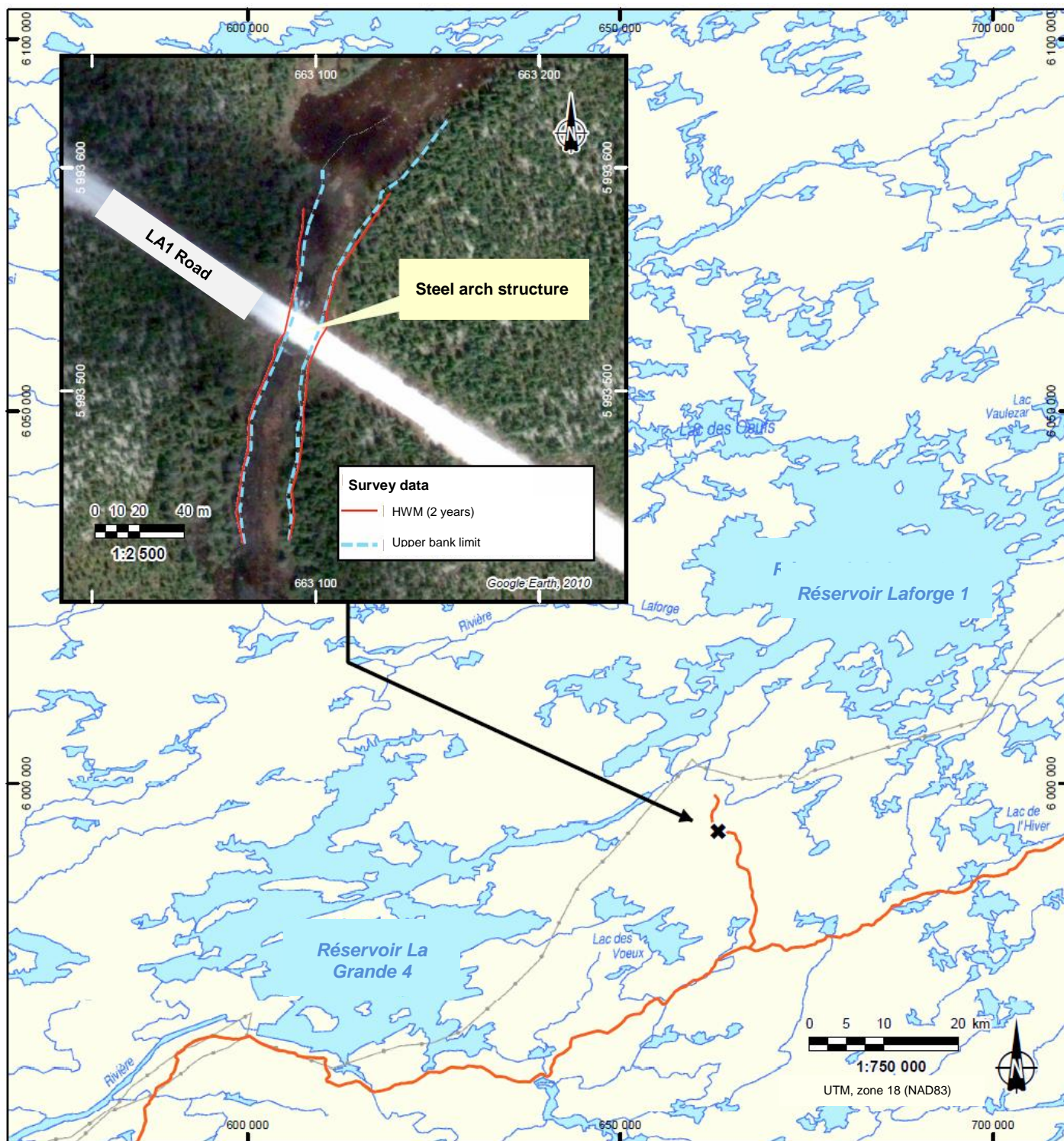
**Photo 4 View of downstream section of stream (July 1, 2018)**



## Appendix 5.1

### Map of work location





## Société de développement de la Baie-James

Construction of a steel arch structure at km 19.8 of the  
LA1 Road to the Laforge 1 Dam

Application for exemption  
to Section 154 of the EQA - MDDELCC

Location of work

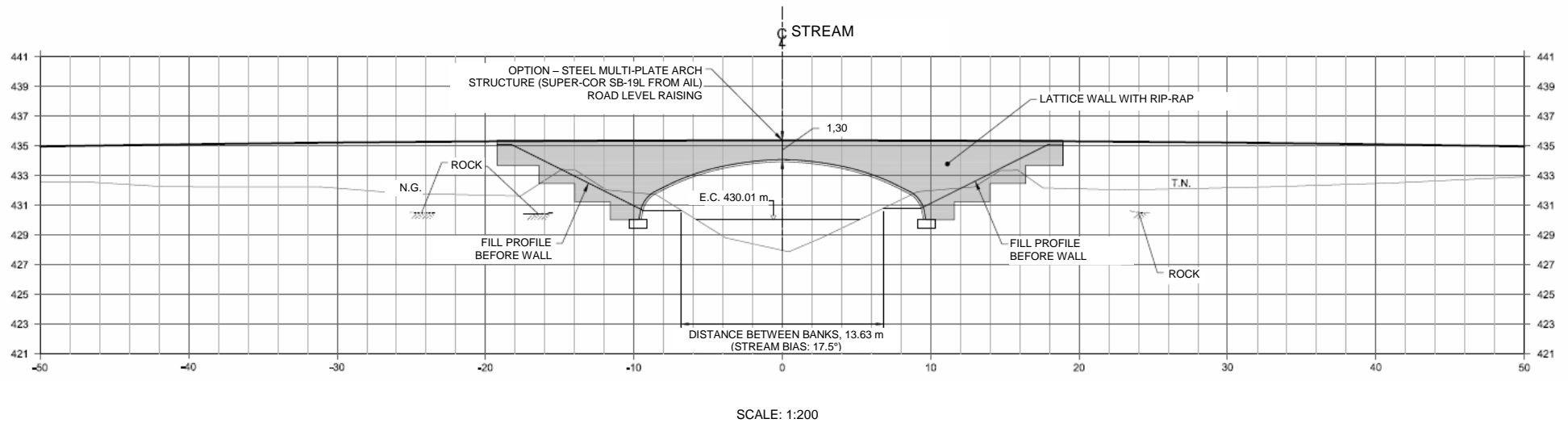


## Appendix 6.1

### Sketch of steel multi-plate arch structure



Assuming a lattice wall width of 0.61 m, the length of the culvert between the two wall faces is 11.82 m.









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