



## Parks Canada Basic Impact Analysis Instructions

### 1. PROJECT TITLE & LOCATION

McKenzies Brook Bridge Replacement - McKenzies Brook, Route 431, Gros Morne National Park of Canada, Western Newfoundland and Labrador Field Unit.

### 2. PROPONENT INFORMATION

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### 3. PROPOSED PROJECT DATES

Planned commencement: 2019-04-08  
Planned completion: 2019-11-30

### 4. INTERNAL PROJECT FILE #

GMNP-2019-006

### 5. PROJECT DESCRIPTION

McKenzies Brook Bridge, along highway Route 431 in Gros Morne National Park, is at the end of its design lifespan and needs to be replaced. The current structure is a single span bridge that is 24.4 meters long, 10.56 meters wide and consists of 6 pre-stressed concrete girders with a reinforced concrete bridge deck. In order to improve highway safety the new bridge will be a new concrete single span structure installed 20 meters downstream (north-west) from the centre line of the existing structure and will require new approaches on either side of the bridge, for a new roadway with an approximate length of 650 linear meters, or 1.9 hectares (Figure 1). The new bridge will be approximately 30 meters long and 11.4 meters wide (Figure 2) and will be a New England Bulb Tee Girder bridge complete with a composite 225 mm cast-in-place concrete deck. The bridge superstructure is founded on fully integral piled abutments, supporting a reinforced concrete cap and cantilevered wingwalls along each edge of the abutment. In order to prepare the new alignment of the highway clearing of vegetation and grubbing will be required and the development of a new highway subgrade complete with asphalt driving surface. Bridge construction will consist of piling, cast-in-place concrete abutment placement (substructure and superstructure), girder placement, and cast-in-place concrete bridge deck construction. Typical highway and bridge construction equipment will be utilized, including: piling equipment (vibro/ diesel hammer), cranes, boom trucks, air compressors, generators, excavators, dump trucks, concrete trucks and asphalt placing equipment.

Following the construction of the new bridge and new approaches the existing (old) bridge structure, including concrete abutments and wingwalls, will be demolished and the asphalt on the roadway will be removed. Approximately 240 meters of the existing roadway will be removed and revegetated. Existing culverts will be removed and slopes will be re-graded, while subsurface rock and soil material will remain and be re-graded to better blend in with the landscape. Revegetation methods to restore/ naturalize the disturbed area will also be applied.

The newly aligned highway will overlap with a portion of Newfoundland and Labrador Hydro's Transmission Line 229 line (1 pole) and Bell Aliant's Fibre Optic line (2 poles). Therefore, additional work will be required by both utility companies to reroute the lines. During the construction of the bridge and highway realignment hydro will install temporary structures, and then once work is complete Hydro will assess the area for permanent reroute options. The activities associated with the reroute of both utility lines will be addressed in a separate Environmental Impact Analysis.





1. Construction of the replacement bridge will require the following work activities:
  - Site preparation, including vegetation clearing and leveling, and stockpiling of any removed topsoil for use in site restoration;
  - Staging of equipment and hazardous materials;
  - Installation of abutments, including pile driving, and cast-in-place concrete;
  - Installation of girders, concrete deck, and asphalt;
  - Embankment armouring through the installation of rip-rap along stream banks.
2. Construction of the highway realignment will require the following work activities:
  - Site preparation, including vegetation clearing, grubbing and excavation;
  - Installation of subsurface aggregate for road design and rock fill where appropriate;
  - Embankment and ditch formation;
  - Installation of culverts;
  - Paving and line painting;
  - Installation of guard rails and traffic/ highway signage.
3. Rehabilitation of old roadway will require the following work activities:
  - Removal of bridge, including railings, traffic/ highway signage, deck, girders, and abutments;
  - Removal of asphalt from old decommissioned road approaches;
  - Removal of culverts;
  - Contouring/ landscaping embankments to naturalize area and reduce erosion;
  - Revegetation.





Figure 1. Aerial photo depicting the approximate location of bridge installation and highway realignment on Route 431 on both approaches leading to McKenzies Brook.





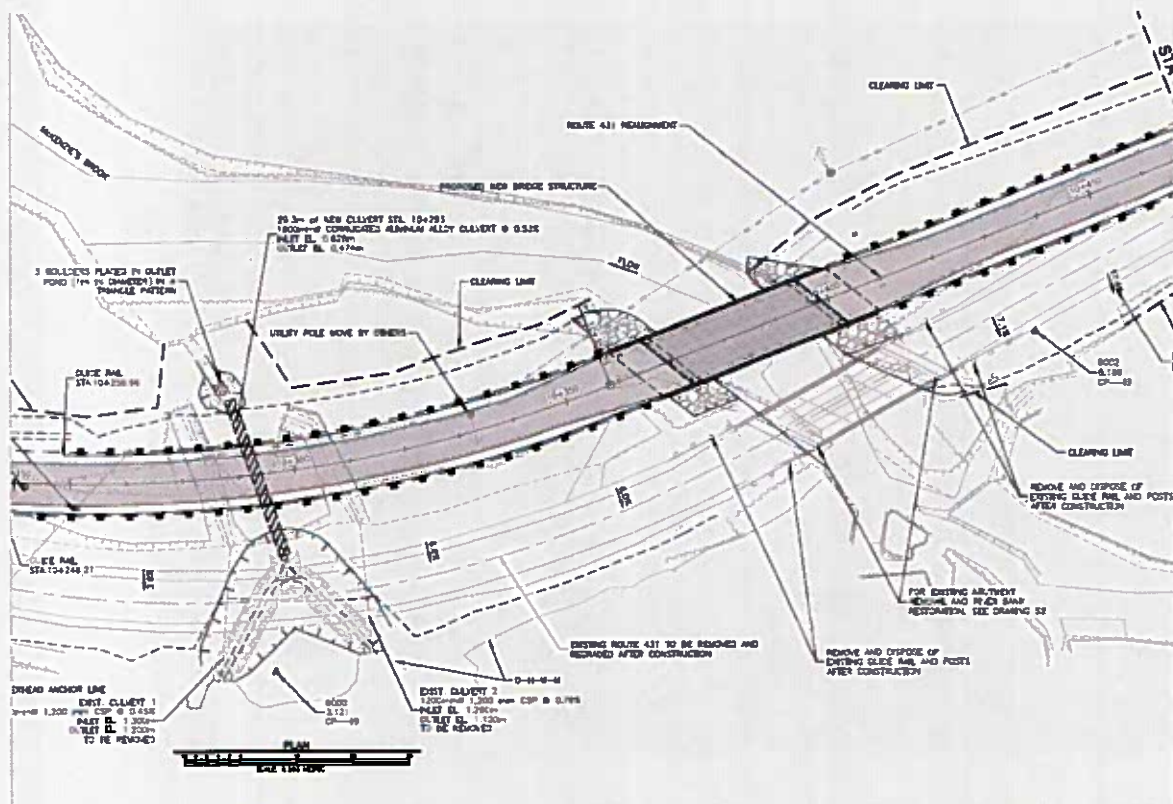


Figure 2. Engineer drawing of proposed bridge structure and highway realignment, including culvert installation and the existing roadway to be decommissioned after the new highway is in service (WSP 2019).

## 6. VALUED COMPONENTS LIKELY TO BE AFFECTED

### Natural Resources

- **Air quality and noise:** In addition to ambient air quality and existing noise levels (e.g., from wind, ocean waves and highway traffic), the project area will be subject to temporary emissions, dust, and noise from equipment and activities.
- **Soil and Landforms:** As indicated in the engineering report this area's surface and subsurface geology is composed of sand, gravel and clay (WSP 2019). Approximately 650 linear meters or 1.9 hectares of soil and landforms will be reformed to support the highway alignment and bridge installation. Project activity will require soil removal and reshaping, and the addition of aggregate to create road embankments. The project could also affect shoreline stability, as the addition of armour stone and bridge infrastructure will alter slopes and change drainage patterns.
- **Surface water:** Construction work will occur over McKenzies Brook and approximately 400 meters upstream of the estuary at the entrance of the South Arm of Bonne Bay. McKenzies Brook has a gravel/ cobble/ rocky bottom with riffle, run and pool characteristics. Horseback Brook is a tributary that joins McKenzies Brook approximately 50 meters upstream from the bridge crossing. Both streams drain steep terrain with shallow soils, so are prone to flash floods, high runoff, considerable bed movement (i.e. downstream movement of rock, gravel, and other debris), and bank erosion / channel movement. However they enter a large (~7 ha) floodplain just upstream of the bridge, where flows are slowed by the lower gradient and a series of active and inactive beaver ponds.
- **Flora:** The immediate area along the highway is typified by riparian and upland boreal forest vegetation. Dominant forest species include balsam fir, black spruce, white spruce, red maple, and white and yellow





birch. Riparian vegetation, predominantly alders, and woody shrubs cover a large area within the project's footprint, including along road embankments and stream banks.

- Fauna: Aquatic fauna that are known to occur in McKenzies Brook include Brook trout (*Salvelinus fontinalis*) and stickleback species common to the region (e.g., 3-spine stickleback). Juvenile Atlantic salmon (*Salmo salar*) were observed during an initial site assessment. Aquatic Invertebrates, including various taxa such as mollusks and arthropods are likely found in the stream. In addition, there is the possibility of downstream effects in the estuary at the outflow of McKenzies, which supports various fish species adapted to brackish and marine water conditions. Various terrestrial fauna typical of Newfoundland's boreal forests may be in the area, including land birds (e.g. Canada Jay, Black-capped Chickadee, Boreal Chickadee, red-breasted nuthatch, various woodpeckers and belted kingfisher), and such mammals as moose, caribou, and various small mammals such as coyotes and mink. Beavers are common in this area, approximately 50-100 meters upstream from the existing structure there are a number of dams that have been created over the years which has created a large area of ponding water.
- Species at risk: None known in area and no critical habitat in area.

#### Visitor Experience

- Viewscape from highway traffic on Route 431
- Work will occur during the peak visitation period for the Park. Route 431 is the only road access for the communities west of the work site including: Glenburnie, Shoal Brook, Woody Point and Trout River.
- The new alignment may cause closure to a nearby day-use area, public may be prohibited from using this area for the duration of the work.
- Access to and from a resource road which travels from highway route 431 to forestry areas south of the park boundary may be temporarily prohibited during different phases of the project.

#### Cultural Resources

- Due to the proximity of the area to the existing highway it is considered disturbed, it is doubtful that this location has intact undisturbed cultural material (see Appendix 2).

## 7. EFFECTS ANALYSIS

#### Natural Resources:

##### Air quality and noise:

- Construction activities could lead to an increase in noise, dust and vehicle emissions above baseline (i.e., daily highway traffic volume), and a decrease in ambient air quality.
- Dust may come from disturbance of exposed soils by machinery, vehicles and wind, as well as construction/ decommission activities such as excavation and transport of rock material. However the probability of dust being generated from disturbed soils is limited by the fact that the majority of the work will be conducted during the spring, when the ground is typically damp in western Newfoundland.

##### Soil and Landforms:

- Removal of vegetation, top organic layer and soil disturbance due to construction/ decommission activity could destabilise soils and stream bank, increase the risk of erosion, and cause unnatural soil compaction and soil permeability.
- Road embankments and ditches will be shaped and could cause unnatural drainage patterns.
- Construction activities can lead to unnatural ground surface contours (e.g. rutting).
- Accidental spills and leaks from equipment and construction materials can impact soils.





- Armour stone and rip-rap material placed on stream banks may contrast with surrounding natural landscape.
- Travel outside of the designated work area can disturb organic material, expose soils, and damage vegetation making the area vulnerable to erosion and establishment of invasive species.
- Repeated travel within the work area by heavy equipment can result in soil compaction (an alteration of soil structure affecting the substrate's water holding capacity, levels of aeration and overall productivity). Compacted soils are at risk to water erosion and the associated vegetation is also vulnerable to direct trampling by equipment.

#### Surface Waters:

- Toxic spills or leaks from machinery, equipment and construction materials could significantly impact water quality McKenzies Brook and the downstream marine environment.
- Fuels and materials stored at temporary staging areas have the potential to leak and leach into ground and surface water.
- Disturbance to the stream bed or banks (e.g., placement of armour stone) could lead to sedimentation and increased turbidity in McKenzies Brook and in the estuary at the entrance into Bonne Bay.
- Vegetation removal, grubbing, and soil excavation along the stream banks could destabilize ground conditions and create a risk of erosion and sediment runoff that could impact water quality of McKenzies Brook.
- Debris from construction and bridge demolition may result in deleterious material entering the river thereby affecting water quality and aquatic organisms.
- Excavating and dewatering activities required for placement of culverts increase the risk of erosion and runoff of sediments into waterbodies.

#### Flora:

- Forest vegetation (primarily trees and other woody plants) will be cut, which can affect soil/ ground stabilization, water storage capacity, light penetration (etc.).
- Soiled machinery may transfer and spread invasive plant species to the park.
- Accidental fuel or oil spills from construction equipment could contaminate soils and groundwater, with adverse consequences for vegetation.
- Soil disturbance in construction and staging areas, as well as decommissioning of old road and bridge structures, may create habitat conducive to the establishment of invasive plant species that would displace or compete with native vegetation.
- Travel outside of the work area by heavy equipment can result in direct loss of vegetation by damaging roots and branches. It also indirectly affects vegetation by disturbing the soil.
- Restoration of the decommissioned roadway will include revegetation.

#### Fauna:

- Disturbance of the stream bed and stream banks, as well as erosion from upland areas where soils are disturbed by construction activities, could lead to sedimentation and increased turbidity in streams. This could adversely affect water quality for aquatic fauna.
- Dewatering activities could cause harm to aquatic fauna.
- Contamination of McKenzies Brook from toxic spills or leaks from machinery, equipment and construction materials (e.g. runoff sediment) could impact the health and survival of freshwater and marine fauna at or downstream from the construction site.
- If vegetation clearing is required removal of riparian and upland vegetation could lead to loss of nests, eggs, dens, food sources and habitat for terrestrial fauna such as migratory birds.
- Construction noise and activities may cause temporary avoidance behaviours, and also disrupt feeding and breeding activity of wildlife in the area.







- Improperly stored construction materials, garbage, and food may act as wildlife attractants, increasing risk of human-wildlife conflict and roadway mortality.
- Accidental fuel or oil spills from construction equipment may negatively affect wildlife and habitat quality through contamination of vegetation or water sources used by wildlife.

#### Visitor Experience:

- Temporary traffic delays are likely to result from construction activities.
- Temporary, localized loss of natural aesthetic appeal and construction noise along the highway are likely to result from construction activities.
- The day use area west of McKenzies Brook may be closed to the public at various stages of the work.
- Access to and from a resource road which travels from highway route 431 to forestry areas south of the park boundary may be prohibited temporarily during different phases of the project.

#### Cultural Resources

- The Archaeological Overview Assessment (see Appendix 2) indicates that it is doubtful that this location has intact undisturbed cultural material. However, there is always some chance that previously unknown cultural resources may be found during construction activities.

## **8. MITIGATION MEASURES**

#### General Mitigations

1. The contractor will prepare an Environmental Protection Plan (EPP) in accordance with Parks Canada Environmental Procedures, a minimum of 5 business days before the start of construction. This EPP should address all mitigations listed here, and prior to work beginning the EPP must be approved by Parks Canada. Note that though this Basic Impact Analysis (BIA) specifies that the contractor must prepare an Environmental Protection Plan, if these two documents are not consistent the most rigorous with regard to environmental stewardship shall be followed. The EPP will include, but not be limited to:
  - a. A Work Area Plan showing proposed activity in each portion of area and including details on how the work limits will be marked and procedures to keep operations within the clearing boundaries to minimize damage to adjacent vegetation and soils.
  - b. An overall site Erosion and Sedimentation Control (ESC) Plan which outlines areas where erosion and sedimentation are likely to occur and the means by which the Contractor proposes to prevent or control these issues. In addition, a localised ESC plan which directs specific mitigation for in-water work is required for culvert installations and any in-water work in McKenzies Brook (e.g. installation of bridge abutments or armour stone). Erosion and sediment control measures must be maintained until all disturbed ground has been permanently stabilized or suspended sediment has resettled to the bed of the waterbody. The plan must include:
    - o Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body;
    - o In-water work areas must be isolated using temporary cofferdams and in-stream work done in the dry as much as possible;
    - o Measures for containing and stabilizing material (e.g. stockpiled topsoil, stockpiled riprap) above the high water mark of nearby waterbodies to prevent re-entry;
    - o Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction;
    - o Repairs to erosion and sediment control measures and structures if damage occurs;
    - o Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
  - c. A Hazardous Materials and Spill Contingency Plan (HMSCP) that details the containment and storage, handling, use, and disposal of empty containers, surplus fuels, or other hydrocarbon products to the satisfaction of the Parks Canada and in accordance with all applicable federal and provincial legislation. The HMSCP will include a list of products and materials to be used or brought on site that are considered or defined as hazardous or toxic to the environment. Such products may include, but are not limited to,





fuels, lubricants, sealants and cement based products. The Safety Data Sheets (SDS) for all chemicals used will be made available onsite. Appropriately sized and stocked spill kits will be on site and capable of handling 125% of the largest potential spill. All contractor's staff will be made aware of their location(s) on site and will be trained on spill response procedures.

- d. A waste management plan (including industrial waste, domestic waste, and human waste), which among other things identifies methods and locations for solid waste disposal.
  - e. Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water, dewatering of ground water, disinfection water, and hydrostatic test water.
2. Prior to starting work all personnel working on site will be required to attend an environmental briefing led by Parks Canada's Environmental Protection Officer to review the mitigation measures required by Parks Canada and highlighted within this Basic Impact Analysis. Contacts for Parks Canada include:  
**Courtney King**, Environmental Protection Officer, Parks Canada, Rocky Harbour, NL. Email: [courtney.king@canada.ca](mailto:courtney.king@canada.ca) Office: 709-458-3492  
**Darroch Whitaker**, Ecologist, Parks Canada, Rocky Harbour, NL. Email: [darroch.whitaker@canada.ca](mailto:darroch.whitaker@canada.ca) Office: 709-458-3464; Cell: 709-458-7293
  3. Inform Parks Canada's Environmental Protection Officer of any changes to the project plan and/or scheduling.
  4. Work will be conducted in a manner that minimizes impacts to existing landscaped and natural areas. Keep disturbance footprint as small as possible (project limits to be approved by Parks Canada), and equipment staging areas shall be limited to existing hardened areas.
  5. Clearing of vegetation requires a Restricted Activity Permit from Gros Morne National Park. This shall be obtained prior to any cutting and can be done so through communication with Park's Canada's Environmental Protection Officer.
  6. This region has frequent extreme weather events with high winds and heavy precipitation. Certain operations such as excavation exposing soil, replacement of culverts, or the application of asphalt, may pose an environmental risk if carried out during extreme wind or rain events. As a result the Environmental Protection Officer has authority to stop or delay the work activity during adverse weather.
  7. Salvageable timber will be piled on site or at an alternate, nearby location identified by Parks Canada, so that, following the completion of this project, it can be scaled by Parks Canada staff and used either to support park operations or distributed to local residents under Gros Morne National Park's Domestic Timber Harvest permitting system.

#### Equipment

8. Prior to arrival on site equipment must be properly tuned, cleaned and free of contaminants, in good operating order, free of leaks (e.g., fuel, hydraulic fluid, coolant, oil or grease), and fitted with standard air emission control devices, spill pans, and spark arrestors. Equipment must also be free of invasive species, plant seeds (e.g., noxious weeds), and soils.
9. Project staff must inspect equipment daily for fuel, hydraulic fluid, and other leaks, and for structural integrity, and inspections will be recorded. This documentation is required to be kept open to site audit. Detected leaks will be addressed immediately.
10. Equipment maintenance (e.g., oil changes, etc.) is not permitted within Park boundaries.
11. Equipment operators must be fully trained and experienced.
12. Fuelling heavy equipment shall not occur within 100 meters of open water, and shall be carried out on a level impermeable roadside surface or at a staging area with spill catchment countermeasures in place. Fuelling sites should not drain towards water bodies or wetlands.
13. Fuelling of small engines (e.g., generators, chainsaws) will not be permitted within 30 meters of open water and portable containment pads must be used to prevent ground contact by accidental fuel spills.
14. Storage and movements of heavy equipment and workers' private vehicles shall be restricted to the 'footprint' of the construction and staging area only and at least 100 meters from the shoreline of water bodies. A staging area shall be established in consultation with Parks Canada.







15. To prevent materials (e.g., soil, rock, construction material, etc.) from escaping dump trucks, loads must not exceed the safe transport capacity specified by the Department of Transportation. Dump trucks must use appropriate covers when necessary.
16. Ensure careful machine operation to prevent damage to surrounding vegetation and soil disturbance. To prevent this, equipment must remain on existing right of ways wherever possible and, where this is not possible make use of rig mats or swamp mats wherever warranted.
17. Operate machinery on land above the high water mark. No stream fording will be permitted.

#### Hazardous materials and contaminants

18. As part of the Environmental Protection Plan, the Contractor must submit and then comply with a Hazardous Materials Management and Spill Contingency Plan (see EPP, above).
19. Storage of large amounts of fuel (more than 900 L) is not permitted in the Park.
20. Handle and store hazardous materials as per applicable federal legislation/regulations. The contractor must have all relevant and current Material Safety Data Sheets available onsite.
21. Hazardous or toxic products (e.g., fuels, lubricants, paint, sealants, etc.) must be (i) securely stored, (ii) shall not be stored within 200 meters from any stream, wetland, or water body, and (iii) shall not be disposed of in the national park.
22. Fuels, gases, or other deleterious substances will be contained within the appropriate and approved containers, and tanks, hoses and connections will be inspected prior to use.
23. Secondary containment and spill kits must be available on site during all periods of work. These must be able to handle 125% of the largest potential spill, and workers must be trained in their use and aware of their location. Spill containment may require a cover or lid or be regularly checked for accumulated water, as the region is prone to high precipitation which could reduce the 125% capture capacity if the container collects water.
24. When working around water an in-water spill kit (i.e. containing absorbent containment booms, etc.) and staff trained to respond to in-water spills and experienced in their use are required to be on site.
25. Following the cleanup of any spill larger than 5 liters the spill site will be inspected to ensure there is complete containment and disposal to the satisfaction of Parks Canada.
26. If potentially hazardous materials (e.g. cement-based products, sealants or paints) are used on site ensure raw material, mixed compounds and wash water are not released to any watercourse or soils. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks can prevent spills into the environment.

#### Waste

27. Clean tools and equipment off-site to prevent the release of wash water that may contain deleterious substances.
28. Burning of any vegetation or worksite materials is prohibited in the park.
29. Sanitary facilities, such as a portable container toilet, shall be provided at the work site, maintained in good working order, and emptied outside the park at an approved waste treatment facility. Portable sanitary facilities shall be situated/ anchored to prevent being upended by winds, thereby preventing waste contaminating the environment.
30. To prevent habituation of wildlife, human wildlife conflict, and risk of wildlife being struck by vehicles, garbage that includes food waste or other wildlife attractants must be securely stored so that it is not accessible to wildlife, and should be disposed of daily.
31. All construction waste shall be secured (e.g. to prevent loss during the high winds that frequently occur in the project area) and then disposed of outside of the park at the appropriate waste management facility on a regular basis (i.e. daily).

#### Erosion and Sediment Control

32. As indicated above, as part of the EPP the contractor must prepare an Erosion and Sedimentation Control (ESC) Management Plan and submit this to Parks Canada's Environmental Protection Officer for approval prior to the start of earthworks activities. Note that the measures listed in the EPP for sediment and erosion control





are only plans, which shall remain flexible and adaptable to site conditions and may require adjustments during construction.

33. Excavated material and debris must be stored in a stable area, above the high water mark or active floodplain and far enough away from open water to prevent runoff of sediment or potential contaminants from entering the stream and nearby wetlands. Protect excavated material from re-entering the water body (e.g., cover with erosion blankets, contain with sediment fencing).
34. Minimize duration of in-water work.
35. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation. As previously stated, in the event of extreme weather events the Environmental Protection Officer has authority to postpone work activity.
36. Develop a response plan that is to be implemented immediately in the event of a sediment release.
37. All surplus excavated material must be removed from the Park as soon as possible and disposed of at an approved location and in an approved manner.
38. Erosion and sedimentation controls must be installed prior to earthworks activities commencing. Regularly inspect and maintain erosion and sediment control structures during all phases of the project and modify or enhance measures as necessary.
39. In the event of erosion and sediment control measure malfunction, work must be stopped until measures are adjusted to address the problem.
40. Erosion and sediment control materials will be readily available on-site. Materials may include but are not limited to rock, gravel, mulch, straw, straw bales, biodegradable erosion control blankets, sediment fencing, staking, polyethylene sheeting, and hemp matting (reference material attached).
41. Prior to removal of sediment and erosion control measures, all disturbed surfaces and shorelines shall be stabilized.
42. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
43. A grace period is required following completion of work prior to the removal of sediment and erosion control measures to allow suspended sediments to settle. Remove accumulated sediments prior to removing erosion control products. Timing of removal shall be approved by Parks Canada's Environmental Protection Officer.

#### Grubbing and Excavation

44. Salvaged topsoil and organic soil must be stockpiled for reclamation or restoration purposes, as directed by Parks Canada. Soil may be stored on hardened surfaces with the appropriate sediment controls in place such as a heavy duty plastic or filter cloth to prevent erosion during precipitation events. Allow space for separate storage of topsoil and spoil; where space is available separate stored topsoil from spoil by at least 1 meter.
45. Vegetation mat ("sod") of native vegetation that is suitable for re-use shall remain property of the Park and be stored at a location directed by a Parks Canada representative.
46. Excavated spoil material shall either be (a) immediately removed from the park; or (b) placed at a level, pre-existing staging area without spillage outside the working limits. The proper erosion and sediment controls shall be applied to this stockpile, and any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation. Excess excavated material may be used for final grading. Surplus material after this activity must be discarded outside of the park.
47. Sediment control measures must be in place before starting work in the vicinity of rivers, water bodies, watercourses, and wetlands. This shall also apply during excavations at intermittent or active drainage channels.
48. Backfill and stabilize new shoulders and ditches as soon as possible. Optimize degree of compaction to minimize erosion and allow for re-vegetation.
49. No grubbing shall occur outside of the delineated work area (see WSP 2019).

#### Culvert Installation

50. A site specific dewatering plan that includes details on how and where the water will be discharged is required to be provided before commencing a pump-out sump to dewater culvert installation sites.
51. Work areas must be isolated using temporary cofferdam or a sealed check structure, and in-stream work to install culverts must be completed in the dry.





52. Where dewatering of fish-bearing waters is necessary to isolate a work area for culvert installation the following conditions for the pump screen, as per Parks Canada Best Management Practices, shall be applied to prevent entrainment or impingement of fish:
  - a. Locate screen in areas and depths of water with low concentrations of fish, and away from natural or artificial structures that may attract fish.
  - b. Orient the screen face in the same direction as the flow of water.
  - c. Ensure openings in the guides and seals are less than the opening criteria to make "fish tight".
  - d. Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
  - e. Provide structural support to the screen panels to prevent sagging and collapse of the screen. Large cylindrical and box type screens should have a manifold installed to ensure even water velocity distribution across the screen surface. The end of the structure should be made of solid materials and the end of the manifold capped.
  - f. Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where debris loading (woody material, leaves, algae mats, etc.) is a concern. A 150 mm (6 in.) spacing between bars is typical.
  - g. Provision must be made for the removal, inspection, and cleaning of screens.
  - h. Ensure regular maintenance and repair of cleaning apparatus, seals, and screens to prevent debris fouling and impingement of fish.
  - i. Pumps must be shut down when fish screens are removed for inspection and cleaning.
53. Additional rock armour stone of the appropriate size may be placed around the intake and outflow of the culvert for erosion and sediment control. Such rock shall be installed at a similar slope to maintain a uniform bank and natural shoreline alignment.

#### Concrete Handling

54. Ensure safe transport of concrete from mixing location to application site. This may include reducing the amount of mixture carried at one time or having additional spill pans available.
55. Ensure raw material, mixed compounds, and contaminated wash water are not released to any watercourse or soils. Fluids and mix shall be contained and removed from the site to an approved disposal facility. Straw bales or sandbags lined with plastic can be used for temporary containment areas to capture the contaminated fluid and prevent spills into the environment.
56. Maintain complete isolation of all cast-in-place concrete and grouting from fish-bearing waters for a minimum of 48 hours if ambient air temperature is above 0 °C and for a minimum of 72 hours if ambient air temperature is below 0 °C or until significantly cured to allow the pH to reach neutral levels.
57. Excess concrete mixture shall be disposed of at a proper waste facility off site, outside the park.

#### Grading, Asphalt Handling and Paving

58. An asphalt plant is not permitted to be set up in the park.
59. Where possible within engineering constraints, milled asphalt materials should be recycled to reduce the need for new gravel.
60. Ensure gravel or road bed material is free of weeds and comes from an approved operational gravel source free of other contaminants.
61. Asphalt works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.
62. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.







63. During grade construction conducted close to any watercourse, water body, or wetland ensure materials are not pushed, fall or are eroded into the water or wetlands.
64. Retain a 30 metre vegetated buffer around water bodies or install runoff management structures.

#### Busting or Blasting

*(Blasting is not planned for this project, however in the event it is required the following mitigations shall apply.)*

65. Blasting requires a Possession of Explosives Permit and a Permit to Remove Natural Objects from Gros Morne National Park. This can be obtained in communication with Parks Canada's Environmental Protection Officer.
66. Blasting must be pre-approved by the Parks Canada project manager and conform to the requirements in the project specification document.
67. The Parks Canada Representative will identify a magazine location for explosives should a factory site or "ready-to-use" explosives storage site be required.
68. The blasting supervisor will ensure no damage to infrastructure, people, surrounding vegetation, or wildlife by mitigating risk of fly rock (e.g., by using a blast mat).
69. Avoid using explosives in or near fish-bearing water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.

#### Demolition and decommissioning of infrastructure and site restoration

70. Before demolition of the old bridge at McKenzies Brook begins, the contractor will prepare a detailed demolition and removal plan that is reviewed and approved by Parks Canada. The proposed plan must be provided to Parks Canada for review at least two (2) weeks before the anticipated start date, and work cannot begin until Parks Canada has approved a final demolition plan. The demolition plan will include information on the timing of the work (season), the methods to be used to remove the bridge (including decking, abutments and highway approaches), mitigations that will be taken to prevent impacts on the aquatic environment, and steps that will be taken to remediate the area, stabilize exposed soils, and prevent sediment runoff.
71. All bridge demolition materials and excavated highway pavement must be removed from the site and disposed of at an approved facility/location outside the national park.
72. No part of the old bridge, construction equipment, or demolition debris may enter the stream. Where needed, measures must in place to prevent demolition materials from entering the stream (e.g. tarps, scaffolding, slurry from concrete cutting, etc.) and they must be inspected regularly and repaired as needed.
73. Demolition of footings for support pilings (and other shoreline work) must not be done during periods of high stream flow, and the forecast should be checked before key phases of demolition start to ensure that they will not span periods of flooding.
74. Replace topsoil where necessary immediately following fine grading.
75. Do not compact topsoil.
76. To stabilize exposed soils and prevent sediment runoff, site rehabilitation will be required to restore vegetation cover once the decommissioned highway approaches and bridge are removed. Areas having no vegetation cover should be hydro-seeded; these areas should first be cultivated to a depth of 100 mm, and salvaged topsoil should be spread in areas lacking sufficient soil; topsoil should be spread evenly and should not be compacted. A seed mixture of 60% annual rye and 40% creeping red fescue should be applied as soon as possible and, if work is completed during the growing season, should be applied not later than 2 weeks after completion of site preparation. Hydroseeding shall be completed before September 30.
77. Effective sediment and erosion control measures will be established and maintained until re-vegetation of disturbed areas is achieved. This may include the application of hemp mats that meet the following standards: 100% biodegradable, certified with no invasives, and a weave that is loose and animal friendly.
78. Implement restoration plan for the disturbed area immediately following completion of construction.

#### Additional environmental mitigations

Note that the mitigations listed above will address many potential impacts on valued components of the environment, visitor experience and cultural resources. The following additional mitigations are required to further protect specific elements of these resources.





#### Air quality and noise

79. All equipment, vehicles and stationary emission sources will be well maintained and used at optimal loads for minimal noise and air emissions.
80. Minimize idling of engines, contingent on operating instructions and temperature considerations.

#### Surface water

*(Note that many mitigations listed elsewhere will also mitigate impacts on surface water, especially those for erosion and sediment control and hazardous materials)*

81. Construction equipment is not permitted to operate in water.
82. Waterway beds are not to be used for borrow material.
83. If in-water work is required cofferdams (or Aqua Dams) must be in place before any in-water work can take place. De-watering will be necessary to prevent suspended sediments, construction debris and other foreign materials from entering the stream. In water work, including mitigations, must be discussed with and approved by Parks Canada's Environmental Protection Officer.
84. If activities near or around water (e.g., placement of armour stone) could cause suspended sediment then a sediment curtain is required.
85. All construction materials must be securely contained at the work site and kept from entering waterbodies.
86. If vegetation cutting occurs within 30 m of a waterbody, regular chainsaw bar lubricant shall be replaced with BioLube or a similar non-toxic, vegetable-based chain oil.
87. Do not clean or drain equipment in waterways. All equipment cleaning and maintenance shall occur outside park boundaries.
88. Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, cause excessive constriction of channel width, reduce flows, or result in the stranding or death of fish.

Vegetation *(Note that many mitigations listed elsewhere will also mitigate impacts on vegetation, especially those for erosion and sediment control)*

89. Vegetation cutting will be limited to drawing specifications (see WSP 2019). If salvageable timber is cut it shall be piled in a location directed by a Parks Canada representative (see mitigation 7).
90. Vegetation clearing must be minimized and wherever possible roots shall be left in the ground during vegetation clearing in order to protect soils and prevent erosion and sedimentation.
91. With the exception of salvageable timber and vegetation mats (see above mitigations), cleared vegetation (i.e., brush, limbs etc.) shall be removed from the worksite to a location outside the park boundaries.

#### Fauna

92. Vehicles associated with this project and travelling on public roads must respect posted speed limits and yield to wildlife.
93. The contractor(s) must immediately report to Parks Canada any wildlife discovered nesting, roosting, or denning on or near the worksite. If an active wildlife nest, roost, or den is found, the vegetated area will be left intact and a suitable sized buffer of shrubs/trees around it will be clearly marked until the nest, roost, or den is no longer in use. The appropriate size of buffer is species dependent, and will be determined in consultation with Parks Canada's Environmental Protection Officer.
94. To prevent incidental destruction of bird nests and nestlings, all vegetation cutting and grubbing must be completed either before or after the primary songbird nesting season. Therefore, this work must not occur between June 1 and after August 15. Should the Contractor wish to clear additional vegetation during June or July they must request permission to do so from Parks Canada's Environmental Protection Officer, who will make a decision whether or not the clearing can proceed based on urgency, consultation with subject area experts, and inspection of the area to be cleared.
95. To prevent habituation of wildlife, human-wildlife conflict, and risk of wildlife being struck by vehicles, feeding of wildlife is strictly prohibited and all potential wildlife attractants, including gasoline, garbage, and food, must be securely stored so that they are not accessible to wildlife. Particular vigilance is required when





workers are leaving at the end of the work day so that attractants are not accessible outside working hours and during days of rest.

96. The contractor(s) must immediately report to Parks Canada any instances of potential problem wildlife (e.g., foxes, coyotes, bears) becoming habituated to people in the vicinity of the worksite. A written record of any problem wildlife encounter must be submitted to the Parks Canada Environmental Protection Officer within 24 hours of the incident.
97. If wildlife is observed during work, give animals the opportunity to leave the work area and go into the surrounding forest or elsewhere to seek new shelter, etc.

#### Visitor Experience

98. Maintain the project area in as tidy a condition as is practical for the duration of work.
99. Appropriate signage warning the public of work in the area should be in place on Highway 431 and/or McKenzies Day Use Area and/or the McKenzies resource access road whenever needed. Further, all such signage and associated materials (e.g., sandbags used to ballast signs) must be removed from the park after the completion of work.
100. Highway traffic must be controlled when work trucks, heavy machinery, and other potentially hazardous vehicles are turning onto or off of the public highway.
101. Traffic disruption must be kept to a minimum.
102. Human wildlife interaction must be promptly reported to Parks Canada. Workers are prohibited from feeding or disturbing wildlife.
103. Any onsite stockpiling area for construction materials must be barricaded from public access.

#### Cultural Resources

104. An Archaeological Impact Assessment (AIA) is not required for the construction of McKenzies Brook Bridge Replacement.
105. Any cultural resources found within the project limits as a result of the Archaeological Overview Assessment (AOA) will be documented and flagged before construction begins. This is to include a buffer of 5 meters out from the resource, which will be deemed a no-go zone for vehicle traffic and machinery. Due to the nature of the project, it may not be possible to have a 5 meter buffer zone around cultural resource. If this is the case, a mitigation strategy could feasibly be developed in collaboration with Parks Canada Cultural Resource Management, Parks Canada Environmental Protection Officer and the Parks Canada Project Manager to ensure that the resources are carefully documented and removed.
106. Project activities are restricted to area presented in the project design plans. If landscaping is required beyond these excavation limits, consult with Parks Canada's Terrestrial Archaeology section to determine if an additional AOA is required prior to the continuation of excavation activities.
107. There could be a chance, however low, that cultural resources, such as features or artifact concentrations may be encountered during construction activities. If cultural resource features are encountered, work should cease in the immediate area. The work area in relation to the findings photo documented and geo-referenced by an onsite Parks Canada representative and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine what will be required to mitigate the chance find.

#### **9. OTHER Considerations**

Check all that apply

- ☐ Public/stakeholder engagement
- ☐ Aboriginal engagement or consultation
- ☒ Surveillance







- ☒ Follow-up monitoring, required to evaluate effectiveness of mitigation measures and/or assess restoration success
- ☐ Follow-up monitoring, required by legislation or policy (indicate basis of requirement e.g. required by the *Species at Risk Act*)

☐ SARA Notification

#### Surveillance and Follow-up:

Regular site surveillance will be required to monitor work site activities and ensure compliance to environmental and cultural resource mitigations. Particular attention will be required for certain phases of the project, such as when work activities are near water's edge, to ensure erosion and sediment controls or dry/ isolated areas, if required, are in place and working effectively.

Follow up monitoring on the decommissioning of the existing roadway will be required to assess the effectiveness of the restoration plan.

### 10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

**Natural Resources:** Given the magnitude of effects, the phasing of project activities, and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to natural resources. Decommissioning and the application of restoration techniques, including re-vegetation, will allow for short term stabilization of soils and erosion control, and commence the process of tree growth and naturalization.

**Visitor Experience:** Given the magnitude of effects, the fact that the existing roadway and bridge will be open to traffic throughout construction, and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to visitor experience.

**Cultural Resources:** Given the magnitude of effects, the low potential for archaeological resources, and application of the mitigation measures the project is unlikely to result in significant residual adverse effects to cultural resources.

### 11. EXPERTS CONSULTED

Department/Agency/Institution: Parks Canada	Date of Request: 2019-03-13
Expert's Name & Contact Information: Carson Wentzell (Retired 2019-04-26)	Title: Resource Management Officer
Expertise Requested: Information on rare plants and other vegetation considerations in the work area	
Response: No vegetation of conservation concern occurs within the proposed work area.	

### 12. DECISION

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- ☒ not likely to cause significant adverse environmental effects.
- ☐ likely to cause significant adverse environmental effects.

FOR SARA REQUIREMENTS:







- ☒ There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

OR, the SARA-Compliant Authorization Decision Tool ([Appendix 2](#)) was used and determined:

- ☐ There is no contravention of SARA prohibitions  
☐ Project activities contravene a SARA prohibition and CAN be authorized under SARA  
☐ Project activities contravene a SARA prohibition and CANNOT be authorized

### 13. RECOMMENDATION AND APPROVAL

<b>Prepared by:</b> Courtney King Environmental Protection Officer Gros Morne National Park	Date: April 29 2019 
<b>Recommended by:</b> Shawn Gerrow A/ Resource Conservation Manager Western Newfoundland and Labrador Field Unit	Date:
<b>Approval Signature:</b> Trevor Rendell Superintendent Gros Morne National Park	Date: April 30 <sup>TH</sup> , 2019 

### 14. ATTACHMENTS

#### 14.1. BMPs

Parks Canada 2015. Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure.

#### 14.2. Other

Appendix 1. Effects Identification Matrix.

Appendix 2. Higdon, J. 2019. Archaeological Overview Assessment - MacKenzie's Brook Bridge Replacement, Gros Morne National Park.

### 15. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

The project must be registered in the [Parks Canada National Impact Assessment Tracking System](#) within the fiscal year the project took place. If the project is on hold, was cancelled, or was determined to be likely to cause significant adverse effects and did not go ahead, please indicate this information in the tracking system (see selections in the *Assessment Status/Decision* field).

- ☐ Project registered in tracking system  
☒ Not yet registered (CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system by the end of April to enable reporting.





**\*\*\*Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations\*\*\***







## Appendix 1: Effects Identification Matrix

### Section A

A. Direct Effects								
			Valued components potentially directly affected by the proposed project					
			Natural Resources					Cultural Resources
			Air	Soil & landforms	Water (surface, ground, crossings)	Flora	Fauna	
Project Components	Phase	Examples of Associated Activities						
	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Clearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Disposal of waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Drainage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Grading	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Backfilling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of machinery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Transport of materials/equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>





## Section B

B. Indirect Effects (all phases)							
		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	Natural resource components affected by the project						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>soils and landforms</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

