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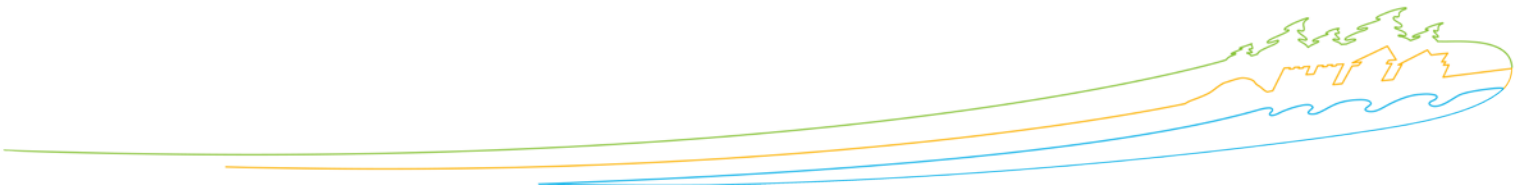

# Mitigation Measures

## Bow Valley Parkway Sense of Arrival Structures

LLYK 2013-0024L

Canada

## Environmental Impacts, Mitigations and Residual Effects

Contractors, subcontractors and Parks Canada staff involved in this project will adhere to the mitigations detailed below as well as relevant measures outlined in the Environmental Best Management Practices for Construction Projects as developed for Banff National Park. Contractors will also be required to develop and implement site-specific plans for safety and erosion and sediment control.

### 4.1 Valued Ecosystem Components

#### *4.1.1 Wildlife*

Impact:
A short-term disturbance to wildlife from machinery noise and the presence of humans is expected.
Mitigations:
- Prior to construction, the project manager will consult with Resource Conservation specialists to identify current wildlife concerns (i.e. sensitive species presently in the area).
- Sightings of rare species or large carnivores will be reported to Banff Dispatch for further direction, which may include a temporary cessation of construction activities.
- Heavy machinery and work vehicles will be shut down when not in use, with limited idling during operation.

Impact:
There is the potential for a reduction in wildlife habitat and cover as a result of tree removal.
Mitigations:
- Vegetation loss and damage will be minimized as much as possible.

Impact:
There is a potential for disturbance or damage to birds and bird nests as a result of vegetation removal.
Mitigations:
- Clearing is scheduled for the fall, outside of the breeding and nesting season (generally early April to late August for most parts of Canada).
- Prior to construction, the project manager will consult with Resource Conservation specialists to identify current wildlife concerns (i.e. sensitive species presently in the area).

Impact:
There is a potential for negative human-wildlife interactions at the work site.
Mitigations:
- All contractors and subcontractors will manage wildlife attractants by storing domestic garbage in bear-proof containers, separately from construction waste, and removing from the site daily.
- No feeding or harassment of wildlife will be permitted.

Impact:
There is a potential for wildlife to be injured after-hours at the work sites.
Mitigation:
- Contractors will ensure that the work sites are properly delineated and secured with excavations fenced and covered as required to prevent injury to wildlife.

Impact:
There is a potential for direct mortality of wildlife as a result of the construction operation.
Mitigations:
• All personnel commuting to the site will follow the posted speed limit and be instructed to watch for wildlife, particularly while driving on the parkway, which has no wildlife fencing.
• Collisions or near-collisions will be immediately reported to Banff Dispatch.
• All excavations will be inspected for the presence of wildlife prior to commencing daily work.
• If used, silt fencing will be regularly inspected for trapped wildlife.

Residual Impacts:
Overall, restricting human use of the Bow Valley Parkway to provide predictable times of habitat security during the critical spring season, will have a positive impact on wildlife. The structures proposed add to the sense of special place. Residual impacts from construction activities are anticipated to be generally short-term and of low magnitude, associated with the disruption of a wildlife movement corridor and disturbance from machinery noise and the presence of work crews.

*4.1.2 Vegetation*

Impact:
Loss of, and potential damage to, trees, shrubs and other plants are anticipated as a result of the clearing required for the overhead structures.
Mitigations:
• Equipment access and material staging areas will be limited to the existing road and right of way.
• Care will be taken during soil and vegetation stripping to ensure that the roots of trees and other vegetation adjacent to the clearing limits are not disturbed or damaged.
• Trees shall be cut so that they fall into the project site.
• Trees over 15 cm DBH (diameter at breast height) will be cut and stockpiled at Niblock Pit to be used for campground firewood.
• Trees less than 15 cm DBH and other woody debris will be stockpiled at Niblock Pit to be burned at a future date or may be burned on site with pre-approval from Parks Canada's Fire and Vegetation Specialist.
• Excavated or stripped materials must be stored so as not to bury plant material that is to be retained.
• Equipment operators must work carefully to ensure that they do not cause mechanical damage to trees and other vegetation outside of the clearing limits.

Impact:
The potential for the introduction of non-native vegetation is anticipated via equipment, work vehicles and soils coming from outside the park or other areas of the park.
Mitigations:
• All vehicles and equipment will arrive on site cleaned of soils and vegetation that may have accumulated from work at other project sites – services for equipment cleaning are available in Canmore and at the industrial compound in Banff.
• Project sites will be surveyed by Parks Canada staff for the presence of non-native vegetation prior to construction and a post-construction non-native vegetation monitoring plan will be developed.
• Control measures for existing non-native vegetation will be conducted by Parks Canada prior to construction as required.
• Only approved native seed mix and vegetation characteristic of the local area will be used for site rehabilitation and landscaping.

• Any additional soil required for the project must be weed-free and pre-approved by Parks Canada's non-native vegetation specialist for the Banff Field Unit.
• Long term monitoring and treatment of non-native plants will be done by LLYK Field Unit Vegetation specialists.

Residual Impacts:
While the project was designed to incorporate the existing highway as much as possible, some disturbance and loss of vegetation will result from the construction of the structures. This is expected to be of low significance given the relatively small scope of the project.

*4.1.3 Soils and Landform*
Impact:
There is a potential for increased erosion and sediment run-off as a result of vegetation removal as well as soil stripping, piling and moving.
Mitigations:
• The contractor will develop and implement an Erosion and Sediment Control Plan.
• Vegetation clearing will be kept to a minimum.
• Erosion control techniques will be implemented as required (for example, silt fencing or tarps).
• Sediment will be filtered from water prior to entering a drainage pathway.
• Care will be taken in salvaging the topsoil layer to be used later in site rehabilitation.
• Topsoil will be stored separately from subsoil and other construction materials.
• Stockpiled soil will be covered.
• Any existing overland flow of water will be directed away from exposed soil.

Impact:
Soil compaction may result from the use of heavy machinery.
Mitigations:
• Personnel will avoid driving vehicles and machinery outside of the disturbed road and right of way.
• Any rutted or disturbed areas will be rehabilitated using approved topsoil and native grass seed mix.

Impact:
There is the potential for soils to become contaminated as a result of vehicle and equipment leaks, spills or accidents.
Mitigations:
• All vehicles and equipment will be inspected daily for leaks.
• Work vehicles and equipment will be operated in accordance with Occupational Health and Safety regulations and contractors will provide a project-specific safety plan to Parks Canada prior to commencing work.
• No hazardous materials, beyond fuel already contained within vehicles and machinery, will be stored on site.
• A spill response kit capable of containing the largest potential spill will be located on site and maintained in good working order; any spill will be immediately reported to Banff Dispatch.

Residual Impacts:
No residual impacts to soils or landforms are anticipated.

*4.1.4 Aquatics and Hydrological Resources*

Impact:

Siltation or degradation of the Bow River could occur during construction.

Mitigations:

• Dependant on proximity to surface water and risk to aquatic resources, the contractor will develop and implement an Erosion and Sediment Control Plan appropriate for conditions at the time of work.
• All construction materials will be securely stored within the confines of the construction site, including excavated or stripped material.
• All construction waste will be securely stored within the confines of the construction site and disposed of appropriately off site; the nearest trade waste facility is the Francis Cooke Regional Class 3 Landfill located in Exshaw, Alberta.
• Dewatering will be subject to approval by the Parks Canada's Environmental Monitor to prevent sediment-laden water from entering natural water bodies.
• All vehicles and equipment will be inspected daily for leaks.
• No hazardous materials, beyond fuel already contained within vehicles and machinery, will be stored on site.
• A spill response kit capable of containing the largest potential spill will be located on site and maintained in good working order; any spill will be immediately reported to Banff Dispatch.

Residual Impacts:

No residual impacts to aquatic or hydrological resources are anticipated.

*4.1.5 Pollution*

Impact:

There is a short-term potential for construction materials, waste and/or spills from the construction vehicles and equipment to harm wildlife, soils, waterways and aesthetics.

Mitigations:

• All contractors and subcontractors will store domestic garbage in bear-proof containers, separately from construction waste, and remove from the site daily.
• All construction materials and waste will be securely stored within the confines of the construction site and disposed of appropriately off site; the nearest trade waste facility is the Francis Cooke Regional Class 3 Landfill located in Exshaw, Alberta.
• All vehicles and equipment will be inspected daily for leaks.
• No hazardous materials, beyond fuel already contained within vehicles and machinery, will be stored on site.
• A spill response kit capable of containing the largest potential spill will be located on site and maintained in good working order; any spill will be immediately reported to Banff Dispatch.

Impact:

A short-term reduction in air quality is anticipated during construction as a result of emissions from construction vehicles and equipment.

Mitigations:

• Heavy machinery and work vehicles will be shut down when not in use, with limited idling during operation.
• Contractors will ensure that ambient air quality is within the guidelines set nationally in the Canada-Wide Standards as well as the provincial guidelines as described in the Alberta Ambient Air Quality Objectives.
• Best management practices will be followed with respect to vehicle and equipment maintenance.
• Construction activities will be completed in a timely and efficient manner, thereby reducing emissions.

Residual Impacts:
The residual pollution impact is the localized decrease in ambient air quality from the operation of vehicles and heavy machinery. After the implementation of the identified mitigation measures, these impacts are expected to be short-term, of low magnitude and within accepted guidelines.

## 4.2 Cultural Features

### *4.2.1 Aesthetics*

Impact:
A short-term impact on visual resources is anticipated as a result of general construction activities such as stockpiling materials, vegetation removal, soil stripping, asphalting and landscaping coupled with the use of heavy machinery.
Mitigations:
- Construction activities will be completed in a timely and efficient manner to minimize time on site and impact to visual resources.
- Contractors will ensure that the construction site is kept as tidy as possible with all materials and waste stored securely while on site.

Residual Impacts:
The long term visual impact will be to positively identify the area of the Bow Valley Parkway as a special place. The residual impacts to aesthetics are the short-term presence of heavy machinery and general construction activities. These impacts are anticipated to be not significant given the relatively short duration and localized scope of the project.

### *4.2.2 Public Facilities and Services*

Impact:
Short closures to traffic may be required for parts of one day on the Bow Valley Parkway during construction.
Mitigations:
- A traffic control plan will be developed and implemented to minimize disturbance to visitors.
- Signs will be used to warn visitors of construction activities and potential delays.
- Motorists will be able to use the Trans-Canada Highway as an alternate route.

Residual Impacts:
The residual impact to public facilities and services from construction activities is the potential for short-term traffic delays on the parkway, but this is anticipated to not be significant as the construction will take place at a time of lower visitor use (fall) and is expected to last less than one month.

Long term the impacts to visitor experience are expected to be positive as visitors will have a sense of welcome and arrival as they enter the Bow Valley Parkway.

### *4.2.3 Visitor Safety*

Impact:
Unauthorized access to the construction site could pose hazards to the public.
Mitigation:
- The construction site will be clearly delineated with signs and construction fencing as required.

Impact:
Traffic delays and/or speed reductions could pose a hazard to users approaching the construction site.
Mitigations:
- A traffic control plan will be developed and implemented to minimize impacts to parkway users.
- Signs will be used to warn users of construction activities, potential delays and speed reductions.

Residual Impacts:
No residual impacts to visitor safety are anticipated.

*4.2.4 Cultural Heritage*

Impact:
Excavation with heavy machinery has the potential to unearth unknown heritage resources. The likelihood of this occurring is low given the previous disturbance that has taken place in the area from road.
Mitigation:
- Work activities will be halted in the event that a suspected heritage resource is discovered and Parks Canada archaeologists will be notified to provide direction and investigate further if required.

Residual Impacts:
No residual impacts to cultural heritage are anticipated.

*4.2.5 Socio-Economic Impacts*

Impact:
The economy is anticipated to benefit from the provision of goods and services associated with the proposed construction, the hiring of contractors and trades people, and the patronization of local restaurants and commercial accommodations.
Mitigation:
- No mitigation required.

Residual Impacts:
The greater sense of place and arrival is anticipated to have a positive impact on the accommodations and businesses along the Bow Valley Parkway.

Inspection and Monitoring Requirements

Parks Canada will assign an Environmental Monitor (EM) to the project that will participate in the initial construction start-up meeting, be present for key construction activities, and ensure mitigation and monitoring requirements are fulfilled.

Contractors will be responsible for implementing the mitigation measures described in this impact analysis; any plan changes or unexpected events will be reviewed with the Parks Canada project manager and EM. Contractors will also be responsible for providing a work schedule to Parks Canada and notifying the EM in advance of key construction activities or changes to the work schedule.

Parks Canada specialists in non-native vegetation will conduct a pre-construction survey for invasive species, conduct control work as required, and develop and implement a post-construction monitoring plan. The cost of implementing the post-construction monitoring plan as well as any additional required rehabilitation will be incurred by the project.

The contractor's Erosion and Sediment Control Plan may outline additional monitoring requirements.