

1. Mitigation Measures

This section includes a comprehensive list of mitigation measures required for the approval of this project. Mitigation measures have been compiled from multiple sources, including but not limited to the Summit Environmental Consultants Inc. 2016 report, and Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure.

1.1 Environmental Protection Plan

To ensure environmental mitigation measures are communicated to contractors and other stakeholders involved in the project, an overarching Environmental Protection Plan is required prior to construction and must include:

- Erosion and sediment control plan: An Erosion and Sedimentation Management Plan shall be prepared for the components of the work undertaken in proximity to watercourses, wetlands or riparian environments. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events. All components require regular maintenance to ensure effectiveness.
- Emergency/Spill response plan: A Spill Response Plan will be prepared and detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation. The Plan shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
- Weed control plan
- Reclamation plan
- Waste management plan

1.2 General Construction Mitigations

1.2.1 Work Site Conditions/Staging/Laydown

- All employees must attend a briefing with an Impact Assessment Officer (IAO), Surveillance Officer (SO) or delegate before beginning work at the site to review and explain the mitigations that are conditions of the project approvals.

- Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.
- Avoid or terminate activities on site that attract or disturb wildlife. Vacate the area and stay away from the immediate location if wildlife display aggressive behaviour or persistent intrusion.
- Control materials that might attract wildlife (e.g. petroleum products, human food and garbage).
- Notify the SO immediately about dens, litters, nests, carcasses (road kills), wildlife activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported to SO within 24 hours.
- Delineate the work zone; clearly mark the limits to active construction and the access and egress locations.
- Staging and laydown areas, as well as portable chemical toilet locations, will be approved by GNP staff and be situated at least 100 m away from Rock Creek and other wetlands.
- When work involves the disturbance of soils or the use of erodible materials (e.g. sands, topsoil), prevent the transport of sediment by the installing of appropriate erosion and sediment control.
- In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction, heavy rain events, construction delays, etc.) erosion control of bared soils or excavated material stockpiles is required.

1.2.2 Equipment Operations

- Equipment movements and vehicles shall be restricted to designated roads, staging areas, or within the project footprint.
- Ensure machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, noxious weeds and soils from off-site. A certificate or on-site inspection by PCA staff will be required.
- Construction vehicles and equipment will have dampening equipment installed and operational.

1.2.3 Air, Soil and Aquatic

- Vehicles and equipment will be in good working order and compliant with provincial and federal emissions standards.
- Limit height of stockpiles and cover as required.
- Limit area of exposed soil and re-establish approved vegetation as soon as possible.
- Use water spraying on granular surfaces as required to reduce dust generation.
- Keep vehicle and equipment idling to a minimum.
- Fill brought in from offsite must be clean. A certification and/or site inspection of source will be required.
- Potable water and wastewater systems will conform to PCA guidelines and best management practices.
- Vehicle use will be minimized in areas with potential for sediment to be transported into waterways.

- Pump out stations, vault toilets, etc. will be situated according to Parks Canada approval.

1.2.4 Gravel Crushing and Washing

- Gravel will be obtained from an approved operational borrow pit only.
- Gravel will not be crushed within 30 meters of any water body.
- If gravel requires washing, the water used will not be returned directly to any watercourse.
- Water free from chemical contaminants will be discharged into ground where further erosion and runoff into surface water is prevented. Discharging into well vegetated ground surface, at a rate which prevents erosion can often provide increased absorption and reduction of sediment load.
- Contaminated water must be treated to meet CCME guidelines or transported outside of the Parks Canada protected heritage place for disposal at an approved facility.
- For waste removed from the park, a detailed receipt of delivery to an approved facility will be provided to the SO.

1.2.5 Fuel Storage and Refueling/Emergency Plans

- Spill kits shall be provided at re-fuelling, lubrication, and repair locations that are capable of dealing with 110% of the largest potential spill and shall be maintained in good working order. Site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- 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.
- Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The SO shall be notified immediately of any spill. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the proponent. The site will be inspected to ensure completion to the expected standard and to the satisfaction of Parks Canada.

1.2.6 Site Clean Up/Waste Disposal

- Tools and equipment may only be cleaned in a designated area that has been approved by PCA to prevent wash water contaminated with deleterious substances from entering riparian areas. Designated cleaning areas will be clearly marked prior to the start of work. Wash water from designated cleaning areas must not be allowed to enter Rock Creek or other riparian areas.

- Where possible, sweep up loose material or debris. Any material thought to pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.
- Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in Parks Canada protected heritage places. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside the Parks Canada protected heritage place as approved by the SO and/or PM. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if there attractants and waste loads shall be covered while being transported.
- Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition.
- Salvage topsoil at all excavation sites for reclamation purposes. Appropriate equipment and methods will be used to avoid mixing topsoil with underlying material during excavation.
- Replace topsoil to all areas immediately following fine grading.
- Do not compact topsoil.
- Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or erosion control blanket is required.

1.2.7 Resurfacing and Grading

- Works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.
- 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.
- 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.
- No grade building shall occur outside of the delineated work area. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage vegetation.
- Materials shall be placed at storage sites or on the grade without spillage outside the work limits. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage vegetation.
- Do not disturb vegetation within 30 meters of the banks of Rock Creek or edges of other riparian areas to retain a natural sediment buffer, or install runoff management structures.
- Ensure gravel or road bed material is free of weeds and comes from an approved operational gravel source free of other contaminants. Certification and/or site inspection of source by PCA staff will be required.

- Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.
- Minimize application of seal coats in wet conditions. Attempt to apply only to dry surfaces and not prior to (within 24 hrs.) or during rainfall. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.

1.2.8 Concrete Handling

- Temporary concrete washout facilities shall be located a minimum of 30m from storm drain inlets, open drainage facilities, and watercourses.
- Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Wood stakes, or sandbag materials can be used to construct temporary containment walls or “barriers”.
- Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
- The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
- Perform washout of concrete mixer trucks in designated areas only.
- Wash concrete from mixer truck chutes and/or concrete pump bin into approved concrete washout facility or collect in an impermeable bag for disposal offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.
- Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities.
- Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and restored.
- Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in the grade right-of-way as directed by the Parks Canada Representative in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be removed offsite.
- Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
- Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour shall be buried in the grade within 48 hours of the pour, subject to approval and direction from the Departmental Representative.

1.2.9 Vegetation Clearing and Removal

- Vegetation clearing and/or removal can negatively impact nesting birds in spring and summer, generally April 15 – August 15 for this area. Avoid all vegetation removal during this time. If vegetation removal must occur within these times, then a biologist/ecologist should further clarify the species presence and timing particular to the work site and any occupied bird nests, eggs, or nests of species protected under the Migratory Bird Convention Act (MBCA).
- If vegetation clearing is done within the nesting window, a survey of the area must be conducted prior to work. If a nest is found during the pre-work surveys, the area will be left intact with a suitable sized buffer of vegetation around it until the young have fledged and left the nest. Size of buffer is species dependent, to be determined in consultation with professional biologist or park ecologist.
- Grass mowing and trimming should not occur during peak spring or fall reptile/amphibian migrations and hatching. Consult a local biologist/ecologist for site and species specific timing windows.
- Minimize disturbance to ground cover and vegetation within project area to retain vegetation to reduce erosion and maintain islands of native vegetation which will help with vegetation restoration in disturbed areas.
- If wildlife is observed during work, if possible, give animals the opportunity to escape the work area.
- Avoid ground vegetation removal during dry, windy periods to prevent erosion of topsoil and reduction of air quality with dirt/dust.
- All vegetation containing non-native species will be piled and burnt or bagged and removed off site to disposal facility.
- Store removed vegetation on already disturbed areas to minimize disturbance area.
- A Field Unit Integrated Pest Management Plan (IPMP) must be completed and approved prior to the use of herbicides to ensure the most effective and least harmful substances are properly used.

1.2.10 Site Reclamation

- Implement the Landscaping Plan provided in the construction package immediately following completion of construction. Areas where vegetation has been damaged or destroyed during construction that is outside of the Landscaping Plan will be replanted with native grass and forb seeds according to the Restoration Plan as approved by PCA. Natural re-vegetation will be encouraged on reclaimed disturbed areas within grassland habitat. High traffic areas may need additional considerations.
- Landscaping and grass reclamation (species composition, seeding rates, etc.) will be performed according to the prescription provided by Parks Canada within the design plan.
- Replace topsoil to all areas immediately following fine grading.
- Do not compact topsoil.

- Where insufficient topsoil is available, imported soil may be used. Imported topsoil must be certified completely free of non-native seeds and compost developed from sewage treatment plants. A site visit to the source may be required. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.
- Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or erosion control blanket is required as directed by SO and/or PM.
- Avoid use of fertilizer unless otherwise directed in Planting Plan provided in construction package to limit non-native vegetation growth and allow for local species to use available nutrients.
- The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.
- Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.
- Consider that parameters such as seed lot purity, seed germination, seedling establishment, seed size and seeding method affect the final stand composition.
- Select seed lots based on indigenous species variety and quality (guaranteed weed seed free content and highest purity and germination), consult with Grasslands National Park Resource Conservation Manager or delegate.
- Reject any seed lots containing any seed of undesirable crop or weed species.
- Conduct broadcast seeding under calm wind conditions.
- Ensure seed is integrated with the soil by light rake or harrow.
- Monitor temporary erosion control measures to prevent seed loss.
- Some seeding procedures may have to be completed by the contractor within the warranty period.
- Use native transplants in areas where conventional seeding applications are not applicable or where slope stability is an issue.
- To monitor reclamation, select 50 plots of 1 square meter along a representative transect(s) through reclamation area. Measure the plant density, cover and composition in each of the 100 square meter plots. The reclamation standard will have been met if 90 of the 100 plots match or exceed 25 plants/m². Exclude species designated as weeds in the work sites from the plant density standard. Consult local vegetation ecologist for current site specific non-native vegetation management program.
- Minimum reclamation standard, as above, to be met within one season post planting.
- Inspect site annually during the growing season.
- Apply amendments annually, depending on reclamation progress.

1.3 Cultural Resources

- Confine excavation to only those areas identified for the project.
- Do not damage or remove any cultural resources.
- In the event that an archeological resources is discovered during construction, immediately stop work within the resource area, leave the resource in place, and contact the Departmental

Representative. This may require review, documentation and removal prior to work beginning within the resource area.

1.4 Species at Risk

1.4.1 General

- Reduce vehicle speeds within park boundaries. Vehicle speed will not exceed 40 km/h within the project area.
- Information will be provided to contractors, visitors, staff and researchers to reduce the risk of introducing and/or spreading exotic species (weed free forage for horses, cleaning vehicles, reporting invasive species, etc.)
- Information on identifying species at risk will be made available to staff and crew during construction phase, and a qualified person capable of identifying species at risk must be on site during construction activities.
- A site visit with the PM, SO and contractor will be conducted prior to starting work to address any last-minute concerns or questions.
- The project area will be checked for species at risk prior to beginning work. Findings will be reported to the PM, SO and park ecologist.
- Construction activities will be conducted during daylight hours.
- Ground clearing activities should occur in early spring or late fall before freeze up to avoid breeding/nesting/migration of birds and amphibians. Exact dates are species-specific and/or temperature dependant, but peak activity is generally April – September. Where ground clearing activities occur between April and September, the area will be checked for wildlife prior to work and if nests/species at risk are found, the park ecologist will be consulted.
- All species at risk sightings will be reported to the PM and SO, who will consult with the park ecologist. Where sightings are in or near the project area, work will stop until otherwise directed by the park ecologist.
- Construction activities are limited to the project area defined in this analysis, boundaries will be marked and clearly delineated to construction crews.

1.4.2 Greater Sage-Grouse

- No vehicles or equipment may be operated on site between 90 minutes before sunset to 90 minutes after sunrise starting April 1 to May 30 during the construction phase. Any work in April and May will be coordinated with annual sage grouse lek surveys to prevent interfering with lek survey results.
- Overall height of structures will be ≤ 1.2 m from the ground. Structures over 1.2 m will employ anti-perching strategies to deter large predatory birds.
- The installation of permanent structures that produce noise must mitigate potential impacts to surrounding critical habitat, for example by operating only intermittently, by being housed in an insulated building or by being buried underground.

- Ground-clearing activities should occur outside of nesting periods for sage-grouse wherever possible. Nesting period tends to be April 27 – July 19 (COSEWIC 2008). If ground clearing activities must occur between April 27 and July 19, areas of sagebrush will be checked for sage-grouse nests prior to start of work. If nests are found, the project manager (PM) and SO will be notified immediately and work will stop until young have fledged the nest or until otherwise advised by the park ecologist.
- Vehicles and machinery will avoid areas of sagebrush wherever reasonably possible (ie – outside of the immediate footprint of infrastructure and/or areas to be excavated).
- Water treatment and/or water collection/disposal systems will be installed within the project area, outside of the geographic scope of critical habitat, or in an area where biophysical and/or functional attributes for critical habitat are absent.

1.4.3 Sprague's Pipit

- Ground clearing work will occur before May 15 or after August 15 to avoid disturbing pipits that may be nesting in the area. If ground clearing activities occur between May 15 and August 15, ground surveys and point counts will be conducted prior to work in order to determine presence of territorial pipits and pipit nests. If pipits are detected, ground clearing and other activities may not occur within a buffer of the pipit and/or nest as determined by the park ecologist. Work may be postponed until the young have fledged the nest.

1.4.4 Northern Leopard Frog

- Maintain a 30 meter minimum buffer of natural vegetation between construction activities and Rock Creek, and a 10 meter buffer around ephemeral pools. Ensure wetlands occurring along the roadside are included in the erosion and sediment control plan and that staging areas are at least 100 m away from wetland edge.
- Weed control and vegetation maintenance for campground will require an Integrated Pest Management Plan, and will include mitigations to avoid harm to frogs and aquatic habitat, including for pesticide application and mowing.
- Mowing for general campground maintenance (rather than for weed control) will follow a BMP when available, or be done in consultation with the park ecologist in the interim.
- Work will be limited to daylight hours to reduce the likelihood of collisions with dispersing and/or foraging individuals, as well as to avoid disturbing breeding behaviours (calling).
- If a mass migration of frogs occurs during construction (dispersal to/from winter, spring and summer habitat and emergence of recently metamorphosed young-of-the-year), the PM and SO will be notified immediately and work will stop until the migration is complete (usually a few days).
- If mass migrations of leopard frogs across the campground are confirmed during the operations phase of the project, a park ecologist will be consulted. If mass migrations seem likely to be a reoccurring event, GNP will develop a strategy to avoid or minimize frog mortality resulting from vehicle collisions.

- Water treatment, collection and disposal systems should be designed to exclude reptiles and amphibians, and/or provide escape devices. Review by park ecologist and/or reptile and amphibian expert(s) is required.

1.4.5 Long-billed Curlew

- Avoid ground clearing activities between April 15 and June 15 (curlews typically do not re-nest). Where ground clearing activities must occur within this time, potentially suitable areas will be checked for evidence of nesting birds prior to work starting. Curlews will circle and alarm call when the nest is approached; if this behaviour is observed, it will be assumed that a nest is nearby and work in that area will stop. Work may resume once the park ecologist has been consulted to determine appropriate mitigations.

1.4.6 Little Brown Myotis

- Work will not occur at night to avoid the need for artificial lighting resulting in additional sensory disturbance of bats or their prey.
- Campground design will minimize light pollution as much as reasonably possible to preserve GNP's dark sky status and minimize potential impacts to wildlife.

1.5 Visitor Experience and Public Safety

- A communications strategy will be developed to inform visitors, stakeholders, staff, researchers and the local community of campground developments and construction and minimize potential conflicts.
- The PM will work with Visitor Experience and contractors to determine when construction activities need to be scheduled around park events to minimize potential conflicts.
- Work areas will be clearly marked to clearly delineate for visitors what areas are not open to the public at the approval of the Departmental Representative.
- The contractor must establish a staging area for all equipment, supplies, office and toilet facilities at the approval of the Departmental Representative.