

APPENDIX C

MANITOBA INFRASTRUCTURE'S GENERAL ENVIRONMENTAL REQUIREMENTS

Appendix C-1

General Environmental Requirements

All construction shall be governed by the *Standard Construction Specification* set out in the contract and as modified in the Special Provisions.

Construction Environmental Management Plans

1. Environmental protection and regulatory compliance during construction will be ensured through the use of a *Construction Environmental Management Plan (CEMP)*. The CEMP may be prepared by MI and provided at the tendering stage or it may be specified as a required Submittal in the contract Special Provisions. In either case, the contractor will adhere to the plan as a condition of the contract.
2. MI will make available a *Guideline for the Preparation of Construction Environmental Management Plans* to assist in the preparation and ensure consistency of CEMPs.

Erosion and Sediment Control

3. Effective sediment and erosion control measures shall be installed before starting work near water to prevent the entry of sediment into any water course or wetland. Final erosion protection measures shall be installed progressively during the project.
4. Erosion and sediment control measures shall be inspected daily during the course of the work. Repairs or adjustments shall be made immediately if any damage is discovered or if these measures are not effective in controlling erosion and sedimentation.
5. Erosion and sediment control measures shall be maintained until complete revegetation of all disturbed areas is achieved. This period may extend beyond the duration of the construction contract, after which the monitoring of revegetation will be the responsibility of MI.
6. The duration of soil exposure shall be minimized and run-off shall be diverted away from the exposed soil.
7. Construction shall be halted during heavy rains with the exception of those works pertaining to erosion and sediment control.
8. Spoil piles shall not be placed within 30m of the ordinary high-water mark or as directed by the Engineer. Spoil piles shall be positioned and maintained in a manner not to increase sediment into the watercourse.

In-Water Work

9. No in-water work shall occur within fish bearing streams from April 1st to June 15th in Southern Manitoba or April 15th to June 30th in Northern Manitoba of any year to accommodate spawning and nursery periods, unless otherwise noted in the Special Provisions. See geographic boundaries at: (<http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/mb-eng.html>).
10. Duration of in-water work shall be minimized.
11. Where possible in-water works shall be conducted under low flow, frozen, or dry conditions to reduce impacts to fish and fish habitat.
12. If work must proceed under flowing water conditions, then the work site shall be isolated from the water while maintaining downstream flow around the isolated site unless otherwise directed by the engineer. Placement of clean rip rap does not need to be isolated.
13. Disturbance to bed and banks of the watercourse or wetland shall be minimized and confined to immediate work site. Unnecessary removal of riparian vegetation shall be avoided. The bed and banks of a watercourse or wetland shall be restored to pre-disturbance conditions in accordance with the contract documents or as directed by the Engineer.
14. Unless otherwise specified in the contract documents site isolation methods shall be approved by the Engineer based on an accepted plan or design submittal.
15. Where a cofferdam shall be installed:
 - Cofferdams shall be designed to accommodate any expected high flows during the construction period.
 - Cofferdams shall be constructed using clean, non-erodible materials. Silts and clays are not acceptable materials for the surficial zone of the cofferdam.
 - Materials shall not be taken from below the ordinary high-water mark of any water body.
 - All spoil material and debris shall be removed from the isolated area prior to the removal of the cofferdam.
 - Exposed soil on the banks of the isolated area shall be stabilized before the cofferdam or sediment barrier is removed.
 - All cofferdam materials shall be removed and the watercourse shall be restored to its original shape and profile.

16. Any isolated site shall be de-watered using an appropriately sized screened pipe or other suitable method to ensure fish do not become entrained in the pipe. Pump intakes shall be sized and adequately screened to prevent debris blockage and fish mortality in accordance with the Freshwater Intake End-of-Pipe Fish Screen Guideline (<http://www.dfo-mpo.gc.ca/Library/223669.pdf>).
17. Sediment laden dewatering discharge shall be pumped to a stilling basin, filtering system or through dense terrestrial vegetation a minimum of 30 metres away from the watercourse before re-entry downstream of the construction area, or as noted in the Special Provisions. All pump discharge points shall be lined with clean rock or other acceptable flow dissipating applications in order to prevent erosion and the release of suspended sediments.

Rip Rap

18. Where rock is required for rock armouring or stabilization:
 - Rock rip rap placement shall not damage the bed and/or banks of the watercourse
 - Clean rocks shall be placed by machinery operating from outside of the water.
 - No rocks shall be obtained from below the ordinary high-water mark of any water body.

Revegetation

19. Immediately following construction and decommissioning, all disturbed areas shall be covered with local top soil and seeded. If local topsoil is not available, other organic based covers may be used to allow seed germination.
20. Do not plant the following undesirable/invasive species:

○ Smooth Brome (<i>Bromus inermis</i>)	○ Yellow Sweet Clover (<i>Melilotus officinalis</i>)
○ Downy Brome (<i>Bromus tectorum</i>)	○ White Sweet Clover (<i>Melilotus alba</i>)
○ Crested Wheatgrass (<i>Agropyron cristatum</i>)	○ Dutch Clover (<i>Trifolium repens</i>)
○ Reed Canary Grass (<i>Phalaris arundinacea</i>)	○ Alsike Clover (<i>Trifolium hybridum</i>)
○ Creeping Red Fescue (<i>Festuca rubra</i>)	○ Alfalfa (<i>Medicago sativa</i>)
○ Kentucky Bluegrass (<i>Poa pratensis</i>)	○ Meadow Foxtail (<i>Alopecurus pratensis</i>)
○ Birdsfoot Trefoil (<i>Lotus corniculatis</i>)	○ Tufted/Cow/Bird Vetch (<i>Vicia cracca</i>)
	○ Tall Fescue (<i>Festuca arundinacea</i>)

Clearing, Grubbing and Brushing

21. Clearing and grubbing shall NOT be undertaken between April 1st and August 30th of any year unless otherwise specified in order to avoid disturbance to nesting birds and other wildlife.
22. Where possible, grubbing shall not occur within 2 m (2.5 yards) of standing timber to prevent damage to root systems of adjacent standing trees and reduce the occurrence of blow down.
23. Timber stockpile sites shall be located in existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 30 meters of a waterbody unless directed by the Engineer. All stockpiled material shall be removed by April 30 following clearing activities.
24. There shall be no bulldozing of woody debris into standing timber.
25. Existing trails, portages and other travel ways shall not be permanently blocked as a result of clearing and grubbing activities so as not to interfere with other users.
26. All cleared vegetation and debris shall be piled and/or compacted in windrows as close to the ground as possible in preparation for disposal. Windrows shall be no closer than 1 meter to the bush line.

Temporary Water Crossings/Access and Pads

27. Temporary in-water crossings, site access, and pads shall be completely removed prior to April 1st of any given year.
28. Temporary water crossings shall be constructed out of clean stone, rock or crushed rock in accordance with the contract documents or as accepted by the Engineer.
29. Culverts shall be hydraulically sized to accommodate expected flows and fish passage requirements for the duration of the installation. The culvert design must be signed and sealed by a qualified engineer.
30. The temporary crossings, site access and pads shall be removed in their entirety upon completion of the work.
31. Upon removal of the temporary crossings, site access or pads, the site shall be rehabilitated to pre-disturbance conditions.

Blasting Near a Watercourse

32. Use of explosives in or near fish habitat shall follow DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998) to avoid causing serious harm to fish. This guideline is available online at <http://www.dfo-mpo.gc.ca/Library/232046.pdf>.
33. The use of ammonium nitrate-fuel oil mixtures in or near water frequented by fish shall be avoided to prevent the deposit of toxic by-products (ammonia) in water frequented by fish.

Table 1. Setback distance (m) from centre of detonation of a confined explosive to fish habitat to achieve 100 kPa guideline criteria for various substrates.

Substrate Type	Weight of Explosive Charge (kg)							
	0.5	1	2	5	10	25	50	100
	Setback Distance (m)							
Rock	3.6	5.0	7.1	11.0	15.9	25.0	35.6	50.3
Frozen Soil	3.3	4.7	6.5	10.4	14.7	23.2	32.9	46.5
Ice	3.0	4.2	5.9	9.3	13.2	20.9	29.5	41.8
Saturated Soil	3.0	4.2	5.9	9.3	13.2	20.9	29.5	41.8
Unsaturated Soil	2.0	2.9	4.1	6.5	9.2	14.5	20.5	29.0

Machinery, Fuel Storage and Handling

34. All fuel handling and storage shall comply with Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001 under The Dangerous Goods Handling and Transportation Act C.C.S.M. c. D12.
35. Storage of fuel stored in drums or containers of 230 L or less shall comply with the requirements of Manitoba Fire Code.
36. Designated Area(s) shall be established for fuel storage and handling, equipment cleaning, refueling and servicing. Any Designated Area shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow clear access, routine inspection and leak detection.

- Machinery and equipment shall be washed, refueled and serviced in such a manner that washwater shall not contaminate surface water or be discharged into a surface water body.
 - In the event that a piece of equipment must be refueled or serviced outside a Designated Area, the fuel shall be transported in approved containers. Absorbent pads or other precautions, such as drip trays or a high density polyethylene (HDPE) groundsheet, shall be used to contain the fuel in the event of spillage.
 - All mobile equipment that is not in use shall be parked within a Designated Area(s) where possible.
37. Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Standard B620-14, Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods.
38. All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site. All used petroleum products and other regulated hazardous wastes shall be collected and disposed of at a licensed facility in accordance with applicable legislative requirements.
39. As refueling, fuel storage and equipment servicing sites are taken out of service, any required remediation shall be conducted, including the disposal of the contaminated material at an appropriate licensed facility to the satisfaction of the Department.
40. Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.

Emergency Response Plan for Spills

41. Due care and caution shall be taken to prevent spills, at all times.
42. An updated list of key contacts and telephone numbers for reporting spills, problems, etc., shall be kept on-site at all times.
43. A Workplace Hazardous Materials Information System (WHMIS) file shall be maintained on-site for all hazardous materials at the work area. Prior to commencement of the Work, Material Safety Data Sheets (MSDS) shall be available on-site for all hazardous materials to be used. An

updated spill response and containment plan for each dangerous good/hazardous waste shall be maintained in the work area at all times.

44. A spill kit or sufficient supply of materials for clean-up or spill containment, for example absorbent material, high density HDPE groundsheets and absorbent oil booms when working near water, shall always be available on site. If necessary, additional material shall be made available on short notice.
45. All personnel responsible for the handling of dangerous goods and hazardous wastes shall be familiar with the on-site response and containment plan.
46. Any reportable spills shall be reported to the Accident Reporting Line at (204) 944-4888 pursuant to Manitoba Regulation 439/87.
47. All spills shall be reported to the Engineer within 24 hours whether it was necessary to report the spill to Manitoba Sustainable Development or not. The spill report shall include the following:
 - personnel responding to the spill
 - material spilled
 - cause of spill
 - estimated amount of material spilled
 - estimated area and volume of soil affected by the spill
 - cleanup action undertaken
 - means used to contain, transport and dispose of the materials involved
48. In the event that there is a spill onto the ground surface from any piece of equipment, such as a broken hydraulic hose, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility. Such events shall be reported immediately to the Engineer and proof of appropriate disposal provided. Contractor field staff trained in spill containment and management shall always be on site.

Disposal

49. Dispose of all used petroleum products and other regulated hazardous wastes in accordance with the Manitoba "Dangerous Goods Handling and Transportation Act".

50. Dispose of non-reusable demolition and construction debris at a waste disposal ground operating under the authority of a permit pursuant to Manitoba Regulation 150/91 respecting Waste Disposal Grounds. Provide proof of appropriate disposal.
51. Any waste and non-salvageable demolition materials removed from the work site shall be stabilized above the Ordinary High-Water Mark to prevent them from entering any watercourse and/or transported to a designated disposal site.
52. Dispose of all sewage and septage from on-site sanitary facilities in accordance with Manitoba Regulation 83/2003, respecting Onsite Wastewater Management Systems Regulation. Provide proof of appropriate disposal.

Dust and Particulate Control

53. All work shall be conducted in a manner that minimizes the raising of dust from construction operations.
54. Only water or approved dust suppressants shall be used for dust control. The use of waste petroleum or petroleum by-products is not allowed.
55. All vehicles used to haul materials to or from the work site shall have the load covered with a tarpaulin cover during transport to prevent material from falling out and creating dust.
56. All material stock piles or spoil piles shall be maintained as to minimize release of particulate matters. This may include, but is not limited to, covering or stabilization of material stockpiled at the work site as required.

Noise and Noise Limitations

57. All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
58. Noise By-laws of the adjacent communities and municipal authorities shall be complied with.
59. Any operation of plant or equipment outside the hours as regulated by local government shall require an exemption in writing.

Wildlife

60. Construction camps and worksites shall be kept clean and tidy. All food and garbage waste shall be stored in a secure manner to prevent access and exposure to local wildlife. All food and garbage waste shall be disposed of at an area which has been designated as an appropriate waste disposal site.
61. Nuisance wildlife shall be immediately reported to Manitoba Sustainable Developments local District Office and the Engineer.

Heritage Resources

62. Work shall immediately cease and be suspended at the location where archaeological or historic artifacts are encountered during construction activities. The discovery shall be reported to the Engineer and work at this location shall not resume unless otherwise authorized by the Engineer.

Work at the location shall be suspended until a Historic Resource Consultant can assess archaeological or historic artifacts that are encountered, and mitigation measures are confirmed with the Manitoba Historic Resources Branch.

Other

63. The disturbed area shall be minimized to the greatest extent possible and limited to the Department's right-of-way unless otherwise permitted by the Department.
64. Utilization of ditches as a heavy-machinery transportation corridor shall be minimized to the greatest extent possible.
65. Existing drainage patterns shall not be altered.
66. Should there be a need for a water source for compaction or dust suppression or related activity, a temporary authorization for any withdrawal greater than 25,000 litres or 550 gdp shall be required from the Manitoba Sustainable Development Water Use Licensing Section. Contact the Manager of Water Use Licensing Section, at (204) 945-3983 prior to the commencement of the work.
67. Any asphalt plant and temporary asphalt plant sites shall have the necessary licence/permit and shall be operated in accordance with the terms and conditions on their licence/permit.