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12.0 ACCIDENTS AND MALFUNCTIONS

During Project construction, operation and maintenance activities there is a risk that accidents and malfunctions may occur that could potentially affect the biophysical environment and public safety. Such events may include: accidental spills and releases of hazardous materials on land and water; accidents or collisions involving construction equipment, machinery, vehicles and wildlife; and fires and explosions. Potential accidents and malfunctions have been identified based on the Project components, activities, equipment and materials (type and quantity) associated with each Project phase as described in **Chapter 3** (Project Description).

Sections 12.1 through **12.4** describe potential accidents and malfunctions that may occur and mitigation that will be applied to minimize the probability and severity of such events occurring. **Section 12.5** provides information on emergency response measures that will be included in the contractor emergency response plans. **Section 12.6** provides an assessment of the risk of such events occurring after appropriate prevention and mitigation procedures are applied, potential environmental effects, emergency response procedures that will be followed and assessment of risk to the environment. **Chapter 5** describes the environmental protection measures that will be implemented during the phases of the Project and will minimize the probability and severity of accidents and malfunctions.

12.1 Accidental Release of Hazardous Substances

Hazardous substances that will be used during construction include fuels (e.g., gasoline, diesel, and propane), lubricating oils and greases, and hydraulic fluids. Hazardous substances will be stored in maintenance compounds located at laydown areas and in accordance with applicable provincial regulations. Quantities of hazardous substances will be limited to amounts required for efficient operation and maintenance of machinery during construction with the largest quantities associated with storage of diesel fuel and gasoline. Diesel and gasoline will be stored in double-walled tanks in accordance with the National Fire Code of Canada 2010 and the *Storage and Handling of Petroleum Products and Allied Products Regulation* of *The Dangerous Goods Handling and Transportation Act of Manitoba*. During construction, there is a risk of accidental releases of these hazardous substances during transport to the Project site via the winter road, during transfer and storage at staging areas and work locations, and during the operation and maintenance of construction equipment, machinery and vehicles. During the Project operation and maintenance phase, hazardous substances will include the same fuels (e.g., gasoline, diesel), lubricating oils and greases, hydraulic fluids and small quantities of herbicides for vegetation control. Herbicides may be used prior to and after seeding to control specific weed species. Herbicides used will be those approved or recommended by Manitoba Conservation and Water Stewardship. Application and storage of herbicides will be in accordance with applicable guidelines and regulatory

Hazardous substances used for the Project will be collected, stored, transported, disposed of and/or treated in accordance with applicable government regulations.

requirements. The primary risks of accidental releases of hazardous substances are associated with construction and maintenance equipment, transport trucks and passenger vehicles. Accidental releases of hazardous materials during Project construction, operation or maintenance could result from improper storage, mechanical failures, collisions or careless use. Depending on the nature, size and location of the release, contamination of soils, surface water, and groundwater may occur and may potentially result in direct and indirect effects on vegetation, wildlife, aquatic habitats, and worker and public health and safety.

Solid and liquid hazardous wastes from the Project will be collected, stored, transported, disposed of and/or treated in accordance with the following provincial legislation: *The Environment Act* (*Waste Disposal Grounds Regulation*); *The Dangerous Goods Handling and Transportation Act* (*Dangerous Goods Handling and Transportation Regulation*, *Environmental Accident Reporting Regulation*, and *Storage and Handling of Petroleum Products and Allied Products Regulations*); and *The Transportation of Dangerous Goods Act.* Hazardous substances are also subject to Manitoba's *The Workplace Safety and Health Act* and regulations. Impacted soil from hydrocarbon spills will be assessed and any soil determined to be contaminated will be managed on-site and removed to an approved treatment site. Other hazardous solid wastes will be disposed of at designated and approved waste disposal grounds. Liquid wastes, including domestic sewage and grey water, will be collected and stored in septic tanks and transported to designated and approved sewage treatment facilities.

The GR130 environmental specifications that are included in ESRA construction contracts provide general environmental protection direction and requirements for environmental topics encountered for most road construction projects (GR130s are presented in **Chapter 5, Appendix 5-4**). As indicated in **Chapter 5**, **Section 5.4.2**, the contractor(s) will prepare and implement a 'Waste Management Plan' that will describe procedures for the handling, reuse or disposal of hazardous waste generated during construction of the proposed Project in accordance with contract specifications. Contractors will transport, store, and dispense petroleum products in accordance with applicable legislation, guidelines, and best management practices and plans to minimize the risk of spills. Mitigation measures will include setback requirements from water bodies, refueling requirements (e.g., drip pans), and provision of on-site spill response kits. Worker training programs will be included in the contractor's spill response plan to check the proper management of hazardous substances including wastes.

An Emergency Response Plan will contain information required to effectively respond to and manage potential accidents and malfunctions such as accidental spills of hazardous substances.

Follow-up actions will include inspections of hazardous substance storage and dispensing facilities and hazardous waste storage locations, review of incident and inventory reports and records, periodic testing and evaluation of emergency response procedures, and conducting environmental site assessments as part of decommissioning temporary construction facilities such as fuel storage locations and construction sites.

12.2 Fires and Explosions

There is a potential risk of fires and explosions during construction, operation and maintenance of the proposed Project. Fires may be caused by construction activities associated with the malfunction of equipment, machinery and vehicles, and from welding, cutting of steel, portable heaters, and burning brush. Fires during operation and maintenance may be ignited by maintenance equipment, machinery, and vehicles. Forest fires could also result from careless smoking or campfires and natural events such as lightning. Accidental explosions could potentially occur due to the improper storing and handling of petroleum products and explosives. Planned explosions will occur with the use of explosives during roadway preparation, rock quarrying, and bridge abutment construction.

The use of explosives is regulated in Canada under the *Explosives Act* and regulations and in Manitoba under *The Workplace Safety and Health Act* and regulations. Contractors will be required to conduct work in accordance with *The Code of Practice for the Use of Explosives* (Manitoba Labour and Immigration Workplace Safety and Health Division 2006) which provides guidance on fulfilling obligations to protect the safety and health of workers and how to implement and maintain safe systems of work where there is a requirement or permit for workers to use explosives in the workplace. Only certified blasters will be permitted to use explosives. ESRA's Environmental Protection Specifications (GR130.15.10 and 15.11) outline requirements for the use of explosives to remove beaver dams (if removal by hand is not feasible) and for blasting near watercourses (**Chapter 5**, **Appendix 5-4**). ESRA's Workplace Safety and Health Specifications (GR140.35 through GR140.39) outline the required safety procedures associated with drilling, blasting, and transportation of explosives (**Chapter 5**, **Appendix 5-5**). Contractors will be required to develop an Explosives and Blasting Management Plan that includes management of blasting activities and will be required to abide by applicable federal and provincial regulations regarding safe transportation, handling, storage, and use of explosives (**Chapter 5**, **Section 5.4.2**).

Explosives will be stored, used, handled and transported according to federal and provincial legislation and only by trained, certified and licenced workers.

The risk of fires resulting from construction and operations and maintenance activities will be mitigated by required adherence to various regulations and best practices. Smoking will be restricted at construction sites and camp locations on a risk-level basis. Depending on local weather conditions, the risk of forest fires is usually highest during the summer months under dry conditions. Fire prevention will be enforced through the application of appropriate fire codes during construction and maintenance activities. ESRA's Environmental Protections Procedures and the contractor's Emergency Response Plan in the event of a wildfire (**Chapter 5**, **Sections 5.3.2** and **5.4.2**) will outline fire response methods and will provide emergency measures to be followed. Provincial fire hazard and risk assessments will be used to guide construction and maintenance activities during the forest fire season.

12.3 Accidental Collisions

During construction and operation and maintenance phases of the Project, the potential exists for collisions. Activities undertaken during these phases can result in accidents potentially causing serious injury and death to workers from collisions between various pieces of construction equipment and vehicles, and between construction equipment and vehicles and wildlife. Measures to reduce the risk of collisions during Project construction will include appropriate construction warning signage, construction speed limits and speed control signage and the use of flag persons near work areas along the all-season road. Contractors will adhere to provincial highway safety regulations and codes, and ESRA's Workplace Safety and Health Specifications (GR140.29) regarding traffic management on the Project site (**Chapter 5**, **Appendix 5-5**).

The potential for collisions during Project operation and maintenance will be minimized through safe road design, posting of appropriate speed limits, warning signage, road surface controls (e.g., dust and ice), and the use of appropriate maintenance vehicles and equipment (**Chapter 5**, **Appendix 5-3**).

The potential for collisions will be minimized through safe road design and construction methods, posting of appropriate speed limits, snowmobile crossing and wildlife warning signage, control of dust and road ice as required, and restricting construction traffic to designated areas.

Following construction and the designation of the all-season road as a departmental road (Provincial Road) under *The Highways and Transportation Act*, the Government of Manitoba will assume responsibility for road safety, operations, and stewardship.

12.4 Accidental Encroachments

During the construction phase of the Project, there is a potential for accidental encroachment on protected or sensitive areas such as watercourses or areas of cultural interest. To mitigate the potential for accidental encroachment into protected or sensitive areas during construction, careful layout, and clear demarcation of the limits of temporary and permanent working areas will be made. As appropriate, buffers will be established to support the protection of sensitive areas from accidental encroachment. Buffers will be clearly identified to designate limits of activities such as vegetation clearing. Following construction, reclamation of encroachment areas will be completed, and compensation measures implemented where necessary (see **Chapter 3**, **Section 3.4.7,** and **Chapter 5** for more information on reclamation).

Contractors will adhere to ESRA's Environmental Protection Specifications during construction including, but not limited to, specifications relating to: work within or around water (GR130.15); clearing and grubbing (GP130.17); and designation of areas and access (GR130.08).

12.5 Emergency Measures

Specific sections of ESRA's Environmental Protection Specifications (GR130s; **Chapter 5**, **Appendix 5-4**) that describe emergency measures that will be implemented in the event of an accident or malfunction include:

GR130.08 Designated Areas;

GR130.09 Materials Storage/Handling;

GR130.10 Spills and Remediation and Emergency Response;

GR130.13 Planned and Unplanned Shutdowns; and

GR130.20 Wildfires.

The contractor's Emergency Response Plan will outline procedures to be followed in case of accidental explosions, fire, and hazardous substance spills.

Under ESRA's Environmental Protection Specifications (GR130.3.2), the contractors will be required to submit to ESRA for review and approval, prior to initiating work on the Project, the following emergency response plans:

- Environmental Emergency Plan for Spill Response and Remediation;
- Material Management Plan in the event of an Unplanned Shutdown; and
- Evacuation and Emergency Preparedness Plan in the Event of a Wildfire.

Under ESRA's Workplace Safety and Health Specifications (GR140.18; **Chapter 5**, **Appendix 5-5**), the contractor(s) will also be required to submit to ESRA for review and approval, prior to initiating work on the Project, an emergency response plan for explosions.

The contractor(s) responsible for Project construction and maintenance will have designated and qualified Emergency Response Coordinators and back-up Coordinators on-site while work is being conducted. The Emergency Response Coordinator will have the authority to redirect workers and equipment to respond quickly and efficiently in the event of an accident, malfunction, or other environmental emergency. Follow-up actions will include inspections of construction/maintenance sites and work locations, review of incident and inventory reports and records, and periodic testing and evaluation of emergency response procedures.

12.6 Risk Assessment

Should an accident or malfunction occur, there is a risk that soil, surface water or groundwater resources may be impacted resulting in potential disruption and impacts to fish and other aquatic species, vegetation and vegetation communities, fen and bog complexes, wildlife, and wildlife habitat. Due to the unpredictable (unplanned) and therefore unknown nature, timing, scope, and extent of the potential occurrence of accidents and malfunctions until such events occur, an assessment of the 'risk' of such events occurring is provided. The risk of accidents and malfunctions occurring will be minimized by contractor(s) adherence to ESRA's Environmental Protection Specifications (**Chapter 5**;

Appendix 5-4), Workplace Safety and Health Specifications (**Chapter 5**, **Appendix 5-5**), other mitigation measures outlined in this EIS, referenced environmental management and protection plans (**Chapter 5**), best management practices and regulatory requirements of required licences and permits related to the Project and implemented by ESRA and its contractors. Risks to the environment, should accidents and/or malfunctions occur, will be minimized through the application of emergency measures described in ESRA's Environmental Protection Specifications (**Section 12.5**).

With the application of ESRA's Environmental Protection Specifications and other environmental protection procedures, including best management practices, the risk of accidents and malfunctions occurring and risk to the environment is low.

Table 12.1 provides a list of the most likely potential accidents or malfunctions that may occur (assuming plausible worst case scenarios), the mitigation measures and standard practices that will be followed throughout the life of the Project to minimize the risk of such events from occurring, and an evaluation of the potential magnitude of risk to the environment in consideration of applied mitigation to reduce the likelihood of such events occurring. In summary, with the application of preventative mitigation measures, standard practices, and emergency response plans the magnitude of environmental risk due to accidents and malfunctions is considered to be low.

Table 12.1: Potential Accidents and Malfunctions, Mitigation Measures, and Evaluation of Environmental Risk

Potential Accident or Malfunction	Preventative / Contingency Mitigation Measures	Probability of Occurrence[a]	Potential Environmental Effects	Emergency Response Procedure[b]	Evaluation of Potential Environmental Risk[c]
Accidental release of hazardous substances.	▪ Adherence to provincial regulations and guidelines regarding hazardous substance storage, use and handling. ▪ Adherence to ESRA's Environmental Protection Specifications (GR130s). ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s).	Low	▪ Adverse effects on fish and fish habitat due to introduction of deleterious substances into waterbodies (e.g., leaked fuel and oil). ▪ Adverse effects on wildlife (including migratory birds) and wildlife habitat due to introduction of deleterious substances into aquatic and terrestrial habitats (e.g., leaked fuel and oil).	▪ Application of ESRA's Environmental Protection Specification GR130.10 (Spills and Remediation and Emergency Response). ▪ Application of contractor's Environmental Emergency Plan for Spill Response and Remediation.	Low
Fire or explosion	▪ Adherence to federal regulations for the storage of explosives. ▪ Adherence to provincial Code of Practice and legislative regulations / requirements for the use of explosives. ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s). ▪ Blasting contractor(s) will be certified. ▪ Presence and maintenance of on-site fire suppression equipment.	Low	▪ Potential mortality of wildlife and /or disturbance of wildlife (including migratory birds). ▪ Destruction of wildlife habitat.	▪ Application of ESRA's Environmental Protection Specification GR130.20 (Wildfires). ▪ Application of contractor's Evacuation and Emergency Preparedness Plan in the Event of a Wildfire. ▪ Application of ESRA's Environmental Protection Specification GR130.13 (Planned and Unplanned Shutdowns), as required. ▪ Application of contractor's Materials Management Plan in the event of an Unplanned Shutdown, as required.	Low
Vehicle collisions	▪ Provide warning signage, speed control, flag persons near work areas along all-season road, as required. ▪ Adherence to provincial highway safety regulations and codes. ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s). ▪ Posting of appropriate speed limit, crossing and wildlife warning signage. ▪ Incorporation of standard safe road design configurations and construction methods in the detailed all-season road design.	Low	▪ Wildlife mortality due to collisions. ▪ Adverse effects on fish and fish habitat due to introduction of deleterious substances into waterbodies (e.g. leaked fuel and oil). ▪ Adverse effects on wildlife (including migratory birds) and wildlife habitat due to introduction of deleterious substances into aquatic and terrestrial habitats (e.g. leaked fuel and oil).	▪ Application of ESRA's Environmental Protection Specification GR130.10 (Spills and Remediation and Emergency Response). ▪ Application of contractor's Environmental Emergency Plan for Spill Response and Remediation.	Low

Note: a Probability of accident or malfunction after application of preventative / contingency mitigation measures
b Refer to **Chapter 5** (Environmental Protection and Sustainable Development), **Appendix 5-4** for ESRA's Environmental Protection Specifications and required emergency response plans
c Risk level considering both preventative measures and application of emergency response measures