10.0 ACCIDENTS, MALFUNCTIONS AND EFFECTS OF THE ENVIRONMENT ON THE PROJECT

10.1 Accidents and Malfunctions

The section considers reasonably plausible accidents and malfunctions that could be expected to occur and potential effects. The main type of accidents or malfunction that could occur for this project is from an accidental spill of a hazardous material (e.g. fuels, oils, hydraulic fluids) either during the construction period or during operations. Also considered was the potential failure of the erosion control system during the construction period.

As with every road construction project, accidents or equipment malfunctions could occur. This could include accidental spills (e.g. fuels, oils, hydraulic fluids) or failure of erosion and sediment control measures. For example, release of substances into sensitive wetland areas or other amphibian aquatic breeding habitat could have an adverse effect on local ecosystems. The following management systems are designed to contain substances that could potentially cause a deleterious affect.

Mitigation and contingency measures to be in place to manage spill events include:

- A comprehensive erosion abatement control plan will be implemented during construction. This plan will be essential during dewatering activities in wetlands and vernal pools located in the road alignment. This will include a system of ditches and swales along with appropriate silt and sedimentation abatement measures (e.g. silt fencing, filter sacks, settling ponds, etc.);
- Education – The effects of spills and leaks will be brought into the periodic tailgate sessions on environmental awareness which all project staff will be required to attend and attain certification by the City;
- Ensure that risks are minimized by properly and safely storing, and working with chemicals;
- Develop a spill prevention and contingency plan (under the Environmental Protection Act (EPA), R.S.O. 1990, in accordance with Ontario Regulation 224/07);
- A hydrocarbon response kit would be on site at all times during the work;
- If leaks/spills occur, immediately contain and clean up spills in accordance with provincial regulatory requirements and construction emergency plans;
- Vehicle fuelling operations shall be carried out by persons trained as per the requirements in the *Liquid Fuels Handling Code (TSSA, O. Reg 219/01 s. 6)*;
- Depending on the type/extent and or nature of spill, the following should be contacted:
    - MOE Spills Action Centre at 1-800-268-6060 ;
    - MOE Pollution 24 hour public hotline at: 1-866-MOE-TIPS (1-866-663-8477); and,
    - Report emergencies by calling 911.

During the operation of the roadway, it may be expected that traffic accidents will occur, and that these may involve tanker trucks or other vehicles containing liquids or dangerous materials. Gasoline and diesel fuel would be the most common products spilled. A level crossing with a rail line is part of the project, so there is a possibility of train – vehicular accidents occurring within the area of significant wetland habitats (PSW#1 & PSW #2) that provide surface water drainage and fish habitat. Guard rails will be installed at all low points in the sag where the roads cross the wetlands and streams to protect

public safety and reduce the likelihood of a rollover and spill into the watercourses and wetlands. Guard rails, flashing crossing lights and automatic barrier will be erected at the level crossing to protect public safety and avoid the chance of a train collision causing a derailment. A sealed, emergency spill kit will be installed at the level crossing to be quickly available to Emergency Services responders to address small volume fuel spills quickly at the site of exposure. It may be expected that larger fuel or chemical spills would be handled by the City HAZMAT responders, who are specially trained in dealing with containment and cleanup of hazardous materials.

Other than common vehicle accidents, the likelihood of roadway accidents or malfunctions occurring is considered to be very low. With the implementation of the above listed management measures any residual effects are not considered to be significant as spills are expected to be of small magnitude, be of limited geographical extent, and be infrequent. No residual permanent adverse effects are anticipated.

10.2 Effects of Accidents and Malfunctions on Identified Species at Risk

As with every road construction project, accidents or equipment malfunctions could occur. This could include accidental spills (e.g. fuels, oils, hydraulic fluids) or failure of erosion and sediment control measures. The effects on surface and ground waters may result in degradation of fish habitats, the availability of potable water or impair the ability of the river system to dilute and transform otherwise harmful pollutants into harmless constituents. The effects on species at risk are discussed in **Section 9.8**, where the following paragraphs are repeated.

The following systems are designed to contain the substances that could potentially cause a deleterious affect on species at risk, fish habitat, ground water and surface water resources:

- ***Stormwater*** – The site will use a comprehensive erosion abatement control plan that will be implemented during construction. This plan will be essential during dewatering activities in wetlands and vernal pools located in the road alignment. This will include a system of ditches and swales along with appropriate silt and sedimentation abatement measures (e.g. silt fencing, filter sacks, settling ponds, etc.);
- ***Spills Containment*** – Various fuels and lubricants will be stored on-site during construction. An appropriate fuel storage tank with built in containment will be used for vehicle fuelling. An Emergency Management Plan will detail emergency response procedures that will be in place and appropriate equipment and materials available to respond to any fuel or hydraulic leaks; and,
- ***Education*** – The effects of spills and leaks will be brought into the periodic tailgate sessions on environmental awareness which all project staff will be required to attend and attain certification by the City.

During the operation of the roadway, it may be expected that traffic accidents will occur, and that these may involve tanker trucks or other vehicles containing liquids or dangerous materials. Gasoline and diesel fuel would be the most common products spilled. A level crossing with a rail line is part of the project, so there is a possibility of derailments or train – vehicular accidents occurring within the area of significant wetland habitats (PSW#1 & PSW #2) that provide surface water drainage and fish habitat. Guard rails will be installed at all low points in the sag where the roads cross the wetlands and streams to protect public safety and reduce the likelihood of a rollover and spill into the watercourses and wetlands. Guard rails, flashing crossing lights and automatic barrier will be erected at the level crossing to protect public safety and avoid the chance of a train collision causing a derailment. A sealed, emergency spill kit will be installed at the level crossing to be quickly available to Emergency Services responders to address small volume fuel spills quickly at the site of exposure. It may be expected that larger fuel or chemical

spills would be handled by the City HAZMAT responders, who are specially trained in dealing with containment and cleanup of hazardous materials.

10.3 Surface Water - Effects of the Environment on the Project

A federal EA must determine the effects of the environment on the project. Flooding and wet weather could result in project construction delays or the release of deleterious substances into the water. Earthquakes/tremors, ice damage and erosion may impact the roadway and its use during operations. The emphasis of this section is on environmental events/conditions that are reasonably plausible and are not limited to events that occur on a regular basis.

Flooding has the greatest opportunity of affecting the construction and operation of the Terry Fox Drive roadway. Hydraulic calculations involving computer modelling have demonstrated that the expected elevation of the Carp River during a 100 year return storm event would be on the order of 93.5 m above sea level. The roadway will be built with a minimum of 1.0 m freeboard above this elevation to provide adequate clearance above the storm levels so that the roads do not become flooded, impairing the ability of emergency services reaching their destinations. The 100 year event flow has a probability of occurring only once every 100 years, however it is possible to have these events back-to-back, o enough safety factor needs to be built in so the environmental conditions do not affect the level of expected service. During these storm events, it is not uncommon for the discharge points from the stormwater treatment system to become temporarily blocked with water, surcharging the piping system and backing up water on the roads. Release points are built into the drainage system so that if surcharging does occur, the water is still released by bypassing the treatment system, spilling into the top of the flood zone.

Through the more forested sections of the roadway, where there is a high incidence of wetlands and small creeks, beaver and the dams they build may effect the operations of the roadway by plugging culverts. A beaver dam and small pond currently exists in PSW#2 and this project would not affect its functions, however the beaver may move it's dam to block the smaller cross culverts. Regular maintenance of the culverts will be required by staff of the City of Ottawa to maintain the capacity to convey flows through all culverts and drainage systems.

Global climate change may affect the operational period and life expectancy of the roadway. Current models for Canada predict an intensification of storm events, separated by longer drought periods and warmer weather however these large picture projections cannot yet be practically brought into site-specific hydraulic modelling without access to extensive continuous rainfall event databases, which is unavailable for this area and impractical at this scale of assessment. In the future, the winters may be warmer and snow and ice build-up may be of lesser concern, meaning that less de-icing salt is used on the roads. This will result in a reduction of rust formation and spalling of concrete surfaces, effectively extending the period of service that may be expected of the roadway surfaces.

The following mitigation/management measures would be put in place to address the above potential

- The roadway would be designed in accordance with appropriate specifications to withstand specific levels of flooding, earthquake/tremor, ice damage and erosion. Regular maintenance exercises must be undertaken in accordance with standard regulations and protocols;
- The work area shall be stabilized against the impacts of high flow and wind events at the end of each workday. Work in the floodplain shall be suspended and the work area stabilized when there is a high probability of a rainfall or storm event;
- Flow velocities are modeled to be 0.1-0.8 m/sec along the fringe of the flood zone. A net decrease of about 0.06 m of the 100 year flood level will occur;

- Good opportunity for flow equalization on both sides of the roadway due to the triple culverts;
- The wildlife guide wall, which will act as a headwall and will minimize erosion of the face closest to the Carp River; and,
- Oil and Grit separators are flood proof to a large degree and can function with the 0.6 m tail water condition expected during the 100 year event.

The likelihood of the above noted effects is considered to be very low. Flooding and earthquakes/tremors events are considered to be very rare in this area. The roadway would be designed to withstand severe ice damaged and erosion. Regular and thorough monitoring and maintenance would be undertaken in accordance with standard provincial regulatory procedures. As such, no adverse significant effects are expected.