

# **APPENDIX**

## APPENDIX A

### **CONSTRUCTION SAFETY IN AND AROUND LANDFILLS**

Note: The accuracy of this information or its completeness is not warranted by the City and must be Verified in each particular by the Contractor.

Further to Manitoba Regulation 204/77, "W210 The Workplace Safety and Health Act", this provision shall cover safety requirements and procedures for construction on and around landfills, dumps and disposal areas. The Contractor shall acquaint himself with all landfills, dumps and disposal areas within and/or adjacent to his construction site. (The Contractor may refer to the Water and Waste Department, Solid Waste Services Division, for information on site locations).

The Contractor is advised that landfill gas (methane and other gases) can emanate from the natural decomposition of refuse or other highly organic material and that such gases may migrate through soils a distance of approximately 90 m. The migration distance may be greater through underground conduits or where surface conditions interfere with normal venting.

Accordingly, the Contractor is advised of the existence of or the potential for the development of hazardous conditions where construction or maintenance activities are undertaken on or within 90 metres of a landfill, dump or disposal area.

The hazard may be one or more of the following:

- 1) Fire may start spontaneously from exposed and/or decomposing refuse or other highly organic material.
- 2) Fires and explosions may occur from the presence of methane gas.
- 3) Landfill gases may cause an oxygen deficiency in underground trenches, vaults, conduits and structures.
- 4) Hydrogen sulphide, a highly toxic and flammable gas, may be present.
- 5) Possible caving of trenches and excavations when Working over or in refuse or highly organic fills.

Prior to commencing any Work, the Contractor shall notify the Engineer of any portion of the construction site which falls on or within 90 metres of landfills, dumps or disposal areas and adequate tests shall be made at the site to determine the concentration of methane or other gases present.

Unless the presence of methane in the area can definitely be ruled out, safety requirements for construction or maintenance Work on or within 90 metres of a landfill, dump or disposal area shall include, but not be limited to the following:

The Contractor shall designate the responsibility of safety to a supervisory person on the site. The person responsible for safety shall be trained in the use of gas detection equipment and shall be responsible for maintaining the detection equipment in accordance with the manufacturer's instructions. He shall be present at all times during excavation with equipment to test for oxygen deficiency and the presence of methane and hydrogen sulphide. He shall test the excavation areas for safe Working conditions and shall ensure that the following safety measures are undertaken. These safety measures shall be explained in detail to all construction supervisors on the site prior to construction and their importance emphasized.

Construction On Landfills, Dumps or Disposal Areas:

1. A combustible gas indicator shall be utilized at all times during trenching, excavating, drilling, or when Working within three (3) metres of an open excavation, and if a building shell or structure is penetrated, then the area penetrated shall be monitored.
2. When trenching, excavating or drilling deeper than 0.6 metres into the soil, or in the presence of detectable concentrations of methane, the operating equipment shall be provided with vertical exhaust pipes or spark-proof exhausts.
3. A minimum of two (2) fire extinguishers of the 50-pound dry chemical type (or equivalent total capacity utilizing more extinguishers) shall be within easy access at all times during trenching, excavating or drilling.
4. A minimum of two Workers shall be on the site at all times during construction activities with one Worker outside of possible gas effects. Each Worker in the vicinity of an open excavation shall have available an approved acid gas-organic vapour respirator and safety goggles for protection from nausea inducing gases which may be emitted during excavation.
5. The operator of trenching equipment shall wear an acid gas - organic vapour respirator while operating the equipment in or astride any trench or excavation.
6. At least two approved type self-contained breathing apparatus in good Working order shall be provided at the site for emergency purposes. Workers shall not be permitted to enter excavations where there is oxygen deficiency, hydrogen sulphide or a combustible mixture of methane without taking precautionary measures. Oxygen deficiency is defined as being less than 19.5 percent.
7. Personnel when in an open excavation or in the presence of landfill gas shall be fully clothed with non-sparking cloth material, wear shoes with non-metallic soles and wear a hard hat and safety goggles or glasses. The excavation shall be monitored continuously in a manner satisfactory to the Engineer for the presence of methane, hydrogen sulphide and oxygen for any duration that personnel are in an excavation. Workers shall immediately vacate an excavation if methane, hydrogen sulphide or oxygen deficiency is detected therein, and shall not be permitted to re-enter the excavation unless satisfactory precautionary measures are implemented.
8. Positive fan-forced ventilation shall be used in cases where trenches or excavations show a build-up of methane, hydrogen sulphide or a lack of oxygen.
9. Lifelines shall be provided and worn as necessary, and barriers erected to protect Workers from falling into open pits and holes from trenching, drilling operations or other excavations.
10. Workers shall Work upwind of any excavation, unless the trench is constantly monitored and declared safe.
11. Workers shall avoid contact with exposed refuse where possible. Irritants or hazardous materials may be present. When handling refuse material, all personnel shall wear gloves.
12. Motors utilized in refuse excavation areas shall be explosion-proof.
13. Smoking shall be prohibited in or near open excavations and in the vicinity of pipe-laying activities. "NO SMOKING"& "NO OPEN FLAME" signs shall be on display in these areas.
14. Welding or open flames shall be permitted only in areas of the site approved by the Engineer.

15. Start up and shut down of equipment shall not be done in areas of exposed refuse or highly organic material.
16. No trench, pit or drill hole shall be left open overnight. Large excavations shall be fenced off.
17. Any refuse exposed during construction activities shall be covered as soon as practical after exposure with at least a 6" (in) layer of earth. Refuse shall not be allowed to remain exposed overnight.
18. All refuse excavated during construction activities shall be disposed of at a legal point of disposal. Provided the Engineer approves, refuse may be temporarily stockpiled if covered with a 6" (in) layer of soil.
19. Entrance into utility access manholes shall be done with extreme caution. Sparks can occur from metal manhole covers and rings. The air in a manhole or enclosed space shall always be tested with a detector before entering. Positive ventilation shall be followed if necessary. Before entry into any underground services the Contractor shall also adhere to City guidelines re: "Safe Work Practices for Confined Entry Work".
20. The Contractor is cautioned on the possibility of caving during excavation in refuse areas.
21. In piping installations, all valves shall be closed as soon as installed to prevent the migration of gases through the pipeline.
22. Specific site conditions may also determine other measures to be taken to protect the health and safety of the Workers and the public.

Construction Near (within 90 m.) of Landfills, Dumps or Disposal Areas:

1. Any excavations shall be monitored for methane and oxygen deficiency if personnel are to be sent in. This must be carried out continuously unless the presence of methane in the area can definitely be ruled out.
2. Should methane gas be found in the area, those precautions applicable to construction on landfills, dumps or disposal areas shall also apply to this situation.

January 2004  
THE CITY OF WINNIPEG  
Water and Waste Department  
Solid Waste Services Division  
2<sup>nd</sup> floor, 1539 Waverley Street  
Winnipeg, Manitoba R3T 4V7

Contact : Colin A. Potter, C.E.T.  
Environmental Technologist  
(204) 986-4463 Cell 470-4936  
Fax: (204) 774-6729  
Email : cpotter@winnipeg.ca

**The City of Winnipeg is providing these plans for your convenience and use.**

**This data should be used for informational purposes only and is provided solely for the convenience of the user. The City of Winnipeg makes no claim as to the correctness, accuracy, completeness or reliability of this data. Technical inaccuracies or typographical errors may appear within the information. This information is provided strictly “as is” without warranty of any kind, either expressed or implied. Use of this information is the sole responsibility of the user.**