UltraTech International, Inc.
11542 Davis Creek Court
Jacksonville, Florida 32256

Canadian Secondary Containment Requirements

The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of national, international and global concern. Early in 1990, CCME began a major restructuring to address more effectively the many important environmental issues facing the country. The CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" has been prepared for owners of storage tank systems, the petroleum marketing and distribution industry and provincial and territorial departments which have the authority to regulate storage tanks containing petroleum products.

The Code is a model set of technical requirements designed to protect the environment from leaking aboveground storage tank systems. The CCME advocates that the recommendations in this Code be adopted as minimum requirements by federal, provincial and territorial regulatory authorities. Secondary Containment Requirements of the Code include the following:

A secondary containment system shall be:

a) a single-wall- bottom storage tank placed entirely within a diked area, with an impermeable barrier in the floor of the containment area and in the dike walls, or
b) a single-wall, double-bottom storage tank placed entirely within a diked area, with an impermeable barrier in the floor of the containment area around the storage tank and in the dike walls, but not underneath the storage tank.

Secondary containment shall be in conformance with the following:
Used oil storage tanks that are manually filled

a) ULC/ORD-C124.23, "Aboveground Waste Oil Tanks" or
b) ULC-S652, "Standard for Tank Assemblies for Collection of Used Oil"

Aboveground Storage Tank Secondary Containment Maintenance (per the Technical Standards and Safety Act, 2000, S. O. 2000, c. 16)**:**

a) Secondary containment shall be inspected on a regular basis, not less than once per week, to ensure the removal of any accumulated surface water, snow, drums, portable containers, objects or product that would reduce the fluid volume capacity to provide a volume of liquid at least 10% greater than the volume of the tank, or a volume of liquid not less than the volume of the largest tank plus 10% of the aggregate volume of all the other tanks, or 10% greater than the volume of the largest tank, whichever is greater (dike with more than one tank)
b) Where secondary containment is provided with valves that allow the removal of accumulated surface water or product, they should be closed and locked when not engaged in a supervised draining operation, and the valve positions must be clearly marked whether opened or closed
c) Controls for the drainage system shall be accessible under fire exposure conditions and located outside the secondary containment area.

Underground piping up to 75 mm nominal pipe diameter shall have secondary containment

Underground secondary containment piping shall:

a) be constructed and installed in conformance with ULC/ORD-C107.7
b) be constructed and installed in conformance with ULC/ORD-C107.4
c) consist of a single-wall piping contained within a synthetic membrane liner manufactured and installed in conformance with ULC/ORD-C58.9
d) consist of a single-wall fiberglass-reinforced plastic, or single-wall steel piping, contained within a duct designed, constructed and installed in conformance with ULC/ORD-C107.19

Underground piping larger than 75 mm nominal pipe diameter shall have:

a) secondary containment with interstitial space leak detection, or b) a precision leak test in conformance with the NVC every two years beginning in the fifth year of operation, or c) leak detection in conformance with ULC/ORD-C58.14, “Nonvolumetric Leak Detection Devices for Underground Flammable Liquid Storage Tanks”

Secondary containment impermeable barriers shall conform to NFC, Subsection 4.3.7 in addition to the following performance specifications:

ULC/ORD-C58.9 using material compatible with the product being stored and installed so that:

Product entering the interstitial space flows to a containment sump and the liner is sealed to the perimeter of the storage tanks or pad when the liner is not installed under the tank

Concrete barriers shall:

Be designed and installed according to good engineering practices to meet the expected loads without fracture, have expansion joints located at least every 6 m, have expansion joints sealed with a sealant

that is compatible with the product being stored and be graded to allow collection of liquids in the interstitial space

Clay barriers shall:

Be installed in accordance with good engineering practice, be a minimum of 300 mm thick, be chemically compatible with native or cover soil, be covered with a minimum of 300 mm of material to prevent dryout and be graded to allow liquid to collect in the interstitial space

Steel barriers shall:

Be a minimum of 4.5 mm thick, have a corrosion protection designed and installed under the direction of a corrosion expert and be sloped to allow liquid to collect in the interstitial space. Provincial and Territorial Departments have the authority to regulate storage tanks and storage requirements. Specific requirements are listed below by Province and Territory:

Quebec - O.C. 1310-97, s. 33 and O. C. 1310-97, s. 34

Every building used to store residual hazardous materials shall be built in such a way as to protect what is stored from any alteration caused by water, snow, frost or heat. The floor shall be impermeable, not liable to be attacked by the stored material and able to support that material. In addition, the layout of the storage area shall be such that leakage or spillage can be contained.

Every shelter under which residual hazardous materials are stored shall have at least 3 sides, a roof and a floor. The floor shall be impermeable, not liable to be attacked by the stored material and able to support that material. The floor shall rise on each side to form an impermeable basin able to hold the greater of the following volumes: 25% of the total capacity of all the receptacles stored therein and 125% of the capacity of the largest receptacle.

Ontario - Guidelines for Environmental Protection Measures at Chemical and Waste Storage Facilities

Secondary containment – general: Containment systems should be installed around all liquid chemical or waste storage containers to collect and contain a leak, spill or overfill from the tank, connections, vents or pressure relief devices. Containment systems should be designed such that the horizontal trajectory of a potential leak from a tank will be confined within the impoundment. As a guide, the perpendicular distance from the tank face to the top of the inside face of any containment should be a minimum of half the height of the tank above the top of the containment wall. The secondary containment system should isolate and protect the tank from vehicular traffic, fire, and spills of incompatible materials that might occur in adjacent storage or work areas. Containment areas may be emptied manually, by pumps or by ejectors. However, all should be manually activated and the condition of the accumulation should be examined before starting to be sure no contaminants

will be discharged into the environment. Accumulations from a secondary containment system should be treated or decontaminated in accordance with local requirement for discharges to sanitary sewer or in accordance with the site certificate of approval and sector specific Effluent Monitoring. Containments should be sized so as to provide a minimum impoundment volume equal to the greater of 110% of the volume of the largest tank, 100% of the volume of the largest tank plus the greater of 10% of the volume of the largest tank or 10% of the aggregate volume of all remaining tanks.

Construction Requirements: All containment areas should be structurally sound, impermeable and able to withstand chemical deterioration and structural stresses from internal and external causes. Containments in flood plains should be designed and constructed to withstand structural damage and overtopping by 1 in 100 year run-off or a storm event. The secondary containment system should be designed and constructed, coated or lined with a permeability rate to the material stored of 1×10^{-6} cm/sec or less and be chemically compatible with the contents of all tanks within the containment area. Tank containment systems should not be located over any existing piping or drainage system whether active or inactive. The floor of the containment should have a minimum slope of 1.5% towards a sump to ensure that any runoff or spilled material will be contained. There should be no sewer connections from any containment area, other than through the containment valve. There should be no piping through the basin floor. If a synthetic liner is used as a secondary containment system, synthetic liners should be at least 60mm in thickness and should be made of a material that will not deteriorate in an underground environment. All punctures, tears or inadequate seams in the liner should be repaired prior to backfilling. The liner should be installed with a slope to the sump of at least 1.5%. All containments should be equipped with a sump with a minimum capacity of 1.5 m^3 from which runoff or spilled material may be pumped or drained by means of a containment valve. Containment valves should be locking position indicator valves. They should be normally locked in the closed position with access restricted.

Underground Installations: When using a double-walled tank for a secondary containment system, the tank should be designed such that the outer wall can contain a release from the inner wall and it should enclose the entire primary tank. The interstitial space should be regularly monitored. The outer wall should be protected against corrosion similar to the inner tank to prevent rupture. The outer wall should be designed to handle the maximum pressure of the inner wall. If a vault is used as a secondary containment system, the vault should be a continuous structure with a chemical resistant water stop used at all joints. For underground installations, appropriate signs should be put in place to indicate the location of the underground facility. Also, an underground barrier should be put in place to prevent possible rupture during excavations that could otherwise encroach upon the underground system.

Piping and Pumps: Pipes draining containment systems should be capable of handling the maximum potential water spray cooling and fire protection system flow within the containment. All piping and containment valves should be protected from freezing. Any coupling or open-ended valve used for making a transfer should be located within a secondary containment system of the transfer station.

Transfer, Loading and Off-Loading: The ground around the loading/unloading system area should be sloped a minimum of 1.5% toward a containment system

British Columbia – Hazardous Waste Regulation B.C. Reg. 63/2009, April1, 2009

The owner of a storage facility where free liquid hazardous waste is stored in containers or tanks must:

a) provide space to allow for manual, visual inspection for leaks
b) provide and maintain an impervious containment system sufficient to hold the larger of 110% of the largest volume of free liquid hazardous waste in any given container or tank, or 25% of the total volume of free liquid hazardous waste in storage.

Alberta – Waste Control Regulation 192/1996

This regulation does not specify how much containment is required. A person who stores hazardous waste shall store it in an amount and manner so that:

a) at least secondary containment is provided for liquid hazardous waste, and there are no openings in the secondary containment system that provide a direct connection to the area surrounding the system and
b) routine inspection of the site can be performed.

New Brunswick – Department of Environment:

There is no specific government document available. The requirements for spill prevention and containment for chemicals/hazardous waste storage are issued under a Certificate of Approval by the Department of Environment and Conservation.

Areas in which chemicals are used or stored shall have impermeable floors and dikes or curbs and shall not have a floor drain system, nor shall they discharge to the environment. Areas inside the dikes or curbs shall have an effective secondary containment capacity of at least 110% of the chemical storage tank capacity, in the case of a single storage container. If there is more than one storage container, the diked area shall be able to retain no less than 110% of the capacity of the largest container or 100% of the capacity of the largest container plus 10% of the aggregate capacity of all additional containers, whichever is greater. These diked areas shall be kept clear of material that may compromise the capacity of the dike system. Once a year, the dikes shall be visually inspected for their liquid containing integrity, and repairs shall be made when required. Once every ten years, the dikes shall be inspected by a means other than visual inspection for their liquid containing integrity and repairs shall be made when required.

Refueling and maintenance of vehicles and equipment shall, whenever possible, be undertaken on a prepared impermeable surface with an oil containment or collection system.

Nova Scotia – There is not an actual regulation that specifies secondary containment, but the two requirements below are included in all Dangerous Goods Approvals

All containers or tanks shall be completely surrounded by secondary containment sized to contain 110% of the volume of the largest tank or container in the specifically contained area or 100% of the volume of the largest tank or container plus 10% of the aggregate capacity of all other containers or tanks in the contained area, whichever is greater.

All transfers of bulk dangerous goods shall be conducted using containment pads or drip pans to capture spills or drips during transfer operations to/from railcars and other approved containers.

Saskatchewan – The Hazardous Substance and Waste Dangerous Goods Regulation

As of April 1, 1995, all waste dangerous goods storage facilities with 500 kilograms/500 liters of waste oil or antifreeze at one time or 100 kilograms/100 liters of all other waste dangerous goods combined, must comply with the Regulation.

Waste dangerous goods container storage areas must be equipped with some form of secondary containment to prevent waste dangerous goods from entering any storm, sanitary sewage or water supply system or from contaminating any other area. The secondary containment must be impermeable (leak tight) and constructed of a material compatible with the waste being stored.

Tanks should be equipped with secondary containment. Acceptable containment systems include: double wall tanks, containment dikes constructed from steel, concrete, earthen dike and liner systems, or other systems which meet the following minimum requirements:

a) the containment material must be compatible with the product stored
b) the capacity of the containment for single tanks must be a minimum of 110% of the capacity of the tank
c) the containment must be leak tight
d) the containment must be constructed so as to be strong enough to hold the capacity of the storage tank in the event of a leak

Manitoba – Dangerous Goods Handling and Transportation D12–M.R. 188/2001

Containment dikes and other protection:

Where, in the opinion of the director or an environmental officer, an aboveground storage tank system is situated in a location such that a release of petroleum product or an allied petroleum product could create a risk to surface water or groundwater quality, or to public health or safety, the director or environment officer may order the owner of the system to:

a) install secondary containment in respect of the system or
b) install any other means of protection referred to in the "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" in respect of the system.

Newfoundland and Labrador – Department of Environment

There is no specific government document available. The requirements for spill prevention and containment for chemicals/hazardous waste storage are issued under a Certificate of Approval by the Department of Environment and Conservation.

Areas in which chemicals are used or stored shall have impermeable floors and dikes or curbs and shall not have a floor drain system, nor shall they discharge to the environment. Areas inside the dikes or curbs shall have an effective secondary containment capacity of at least 110% of the chemical storage tank capacity, in the case of a single storage container. If there is more than one storage container, the diked area shall be able to retain no less than 110% of the capacity of the largest container or 100% of the capacity of the largest container plus 10% of the aggregate capacity of all additional containers, whichever is greater. These diked areas shall be kept clear of material that may compromise the capacity of the dike system. Ince a year, the dikes shall be visually inspected for their liquid containing integrity, and repairs shall be made when required. Once every ten years, the dikes shall be inspected by a means other than visual inspection for their liquid containing integrity and repairs shall be made when required.

Refueling and maintenance of vehicles and equipment shall, whenever possible, be undertaken on a prepared impermeable surface with an oil containment or collection system.

Prince Edward Island – Environmental Protection Act Petroleum storage Tanks Regulations: Cap. E-9, 1988

No person shall install an aboveground single-wall storage tank with a capacity of 2300 liters or greater without a secondary containment system.

The volumetric capacity of the containment system required shall be: a) in the case of one storage tank, 110% of the petroleum storage capacity of the storage tank or b) in the case of a multi-tank storage tank system, 110% of the petroleum storage capacity of the largest storage tank.

The containment capacity of the containment system required shall be calculated after deducting the exterior displacement volume of the storage tanks, with the exception of the largest tank, in order to allow for the displacement volume occupied by the storage tanks.

No person shall install an aboveground storage tank or storage tank system in a manner that may result in such a storage tank, or storage tank system being in contact with the ground, unless an adequate corrosion control system is installed at the same time to protect the portion of any storage tank that may be in contact with the ground and such storage tank or storage tank system complies with the NFC of Canada.

Nunavut - The CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products"

Northwest Territories - The CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products"

Yukon - The CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products"