Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products

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Canadian Council of Ministers of the Environment

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Cette publication est aussi disponible en français sous le titre *Code de recommandations techniques pour la protection de l'environnement applicable aux systèmes de stockage hors sol de produits pétroliers*.

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Abstract

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.

The Code provides recommendations concerning registration, design, and installation of new systems, upgrades of *existing storage tank systems*, operation and maintenance, and withdrawal from service.

Résumé

Le «Code de recommandations techniques pour la protection de l'environnement applicable aux systèmes de stockage hors sol de produits pétroliers» a été préparé par le CCME à l'intention des *propriétaires* de *systèmes de stockage*, de l'industrie de la mise en marché et de la distribution du pétrole et des ministères provinciaux et territoriaux habilités à réglementer les *réservoirs de stockage* de *produits pétroliers*.

Le Code est un ensemble type de règles techniques visant à protéger l'environnement contre les *fuites* dans les *systèmes de stockage hors sol*.

Le CCME souhaite vivement que les autorités fédérales, provinciales et territoriales adoptent à titre de conditions minimales les mesures recommandées dans le Code.

Les recommandations concernent l'enregistrement, la conception et l'installation des nouveaux *systèmes de stockage*, l'amélioration des systèmes *existants* ainsi que l'exploitation, l'entretien et la mise hors service des *systèmes de stockage*.

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Preface

The "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" (hereafter referred to as "this Code") is published by the Canadian Council of Ministers of the Environment through its National Task Force on Storage Tanks.

This Code offers a model set of technical requirements designed to protect the environment by preventing product releases from *aboveground storage tanks* and *piping*. This Code is written in a form suitable for adoption by legislative authorities in Canada.

The CCME advocates that the recommendations in this Code be adopted as minimum requirements by provincial and territorial authorities. These authorities may vary the recommendations to make them more stringent in order to address specific concerns in that province or territory.

This Code has been developed with the voluntary assistance of many experts who have contributed to the work of the National Task Force on Storage Tanks.

The membership of the National Task Force is representative of provincial, territorial, and federal agencies which have the authority to regulate *aboveground storage tanks* containing *petroleum products*. The task force also includes members from the Underwriters' Laboratories of Canada and associations representing major tank *owners* and manufacturers.

Comments and inquiries on the use of this Code and suggestions for its improvement are welcomed and should be sent to:

National Task Force on Storage Tanks
Oil, Gas and Energy Division
Environment Canada
13th Floor, Place Vincent Massey
Ottawa, Ontario
K1A 0H3
FAX: 819–953–8903

As Code revisions are developed in response to these submissions, they will be made available for public review and comment before inclusion in the next edition.

Acknowledgements

The National Task Force wishes to acknowledge the many individuals who have contributed to the production of this Code. In particular, appreciation is expressed to the Codes Section, Institute for Research in Construction for providing the National Fire Code of Canada as a useful model and organizational format for those responsible for preparing this Code.

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Rationale for an Environmental Code of Practice

In recent years, there has been a tremendous increase in Canadians' awareness and concern for the environment. This awareness and concern translate into strong new demands that government and industry re–examine many aspects of governmental and human activities to prevent further environmental damage.

Historically, the requirements of the National Fire Code (NFC), provincial fire codes and the Canadian Standards Association (CSA) have been used in Canada for the installation and operation of *aboveground storage tank systems* containing *petroleum products*. The first edition of the NFC was published in 1963 and the first edition of CSA Standard B139, "Installation Code for Oil Burning Equipment", was published in 1957. These codes were written from the viewpoint of fire prevention and primarily cover the elements of fire prevention and fire safety.

In many instances, measures adopted to prevent fires also serve to prevent product releases to the environment. During the 1970s and 80s, however, increases in the number of incidents of *spills*, overfills, and *leaking* bottoms of *aboveground storage tanks* caused environmental problems.

Contamination of groundwater supplies with products *leaking* from a *storage tank system* can have serious social and economic effects on a community. When *petroleum product* has contaminated municipal well–water supply, alternative water supply and/or cleanup costs can be extremely high. For example, a small *leak* from a heating oil tank or supply line may not create a significant fire threat, but may contaminate a water supply that could cost millions of dollars to replace or clean up. In some areas, an alternative water supply may not be available.

Over the long term, prevention of product releases and early detection of releases when they do occur are presumed to be less disruptive socially and economically than paying for alternative water supplies and costly cleanups.

In 1986, the federal, provincial, and territorial ministers of the environment unanimously agreed that codes of practice for underground and *aboveground storage tank systems* should be developed. Consequently, this "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" has been prepared to provide recommended practices that are beyond the scope of the National Fire Code of Canada and CSA Standard B139, "Installation Code for Oil Burning Appliances". A similar code of practice, CCME– EPC–LST–61E, "Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products", was published in 1988; a revised edition appeared in 1993.

A Guide to the Use of this Code

Purpose

This "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" presents minimum requirements to protect the environment from *existing*, new, or proposed *aboveground storage tank systems* that contain *petroleum products*. Its primary purpose is the promotion of environmentally sound management of *aboveground petroleum product storage tank systems* through the application of uniform performance standards throughout Canada.

Relation to Federal, Provincial, and Territorial Regulations

This Code is a model code only and must be adopted by a federal, provincial, or territorial *authority having jurisdiction* in order to come into effect.

Although all the federal, provincial, and territorial *authorities having jurisdiction* endorsed and participated in the development of this model code, they may not make this Code a regulatory requirement by adopting it, in whole, into their regulations. In such instances, only the provincial or territorial regulations should be followed and this Code does not apply.

Where this Code is adopted by the *authority having jurisdiction*, it shall be followed subject to any restrictions or conditions added by the regulatory authority. Readers of this Code are therefore advised to check with the federal, provincial, or territorial *authority having jurisdiction* to see whether this Code applies in their area of interest. (See Appendix A for the addresses, telephone, and FAX numbers of the federal, provincial, and territorial *authorities having jurisdiction*.)

Relation to Other Codes

The "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" is written as a complementary document to the National Fire Code of Canada (1990) and CAN/CSA–B139, "Installation Code for Oil Burning Equipment".

National Fire Code of Canada (NFC)

This Code has been developed in conjunction with the National Research Council, publisher of the National Fire Code of Canada, to minimize the possibility of conflict between the contents of the two codes.
While this Code provides minimum requirements for the prevention of losses of *petroleum product* from *aboveground storage tank systems* that may lead to environmental problems (primarily groundwater contamination), the NFC sets technical requirements for the storage and *handling* of *flammable* and *combustible liquids* from the point of view of preventing fires or explosions.

In order to ensure effective application, fire officials, environmental officials, or other *authorities having jurisdiction* to regulate *aboveground petroleum product storage tanks* should be fully conversant with the technical requirements in both codes. This is the only way to ensure that *aboveground storage tanks* are built, installed, operated, and removed in a manner that meets both fire–safety and environmental requirements.

CAN/CSA–B139, "Installation Code for Oil Burning Equipment"

This Code was developed in cooperation with the Canadian Standards Association, publishers of CAN/CSA–B139, "Installation Code for Oil Burning Equipment". *Storage tank systems* that fall within the scope of CAN/CSA–B139 are predominantly heating or furnace oil tanks and *storage tanks* containing diesel fuel that are connected to stationary combustion engines (e.g., power generators).

The CAN/CSA–B139 Code was revised and published in 1991. This CCME Environmental Code refers to the 1991 edition of CAN/CSA–B139 for most of the technical requirements. This Code provides additional requirements that address concerns, such as the upgrading of *existing storage tank systems*, which are beyond the scope of CAN/CSA–B139.

Regulatory authorities, *owners*, and installers of *storage tank systems* should be fully conversant with the technical requirements of CAN/CSA–B139, this Code (where it is in force), and all provincial regulations that apply.

Structure and Content

This Code is drafted in such a way that it may be adopted or enacted for legal use by any jurisdictional authority in Canada.

A decimal numbering system has been used throughout this Code. The first number indicates the Part of the Code; the second, the Section within the Part; the third, the Article within the Section. An article may be further broken down into Sentences, Clauses, and Subclauses, each of which is indicated in brackets, as shown here:

4	Part
4.5	Section
4.5.1	Article
4.5.1(1)	Sentence
4.5.1(1)(a)	Clause
4.5.1(1)(a)(i)	Subclause

The following is a summary of the contents of this Code.

Part 1 Application and Definitions

Part 1 defines terms and stipulates to what this Code applies. It includes the necessary administrative details to ensure that the technical requirements can be applied with a minimum of difficulty.

Part 2 Registration and Approval to Construct Aboveground Storage Tank Systems

Part 2 contains the requirements for the registration of *aboveground storage tank systems*. It includes the scope of the tank systems that are required to be registered as well as provisions for identifying *storage tank systems.*

Part 3 Design and Installation of New Aboveground Storage Tank Systems

The design and installation of new *aboveground storage tank systems* are covered in Part 3. The recommendations covering *secondary containment, storage tanks, piping, product transfer areas*, and associated equipment are intended to ensure that equipment is designed and installed properly in order to minimize the possibility of product *spills* and *leaks*. A significant portion of this Part refers to the National Fire Code.

Part 4 Upgrading of Existing Aboveground Storage Tank Systems

Part 4 outlines the requirements for the upgrading of *existing aboveground storage tank systems*. This Part is provided to ensure that those *storage tank systems* that are considered to have inadequate diking or *secondary containment* are replaced or upgraded to higher defined standards within a reasonable period of time. In addition, requirements for upgrading *storage tank systems* with overfill protection and groundwater monitoring are defined.

Part 5 Operation and Maintenance

Part 5 covers the ongoing operation and maintenance of *aboveground storage tank systems*. The intention is to prevent product releases, *spills,* or *leaks*. When they do occur, the recommendations in this Part are designed to help *operators* of *storage tank systems* to detect, terminate, and mitigate releases as quickly as possible.

Part 6 Withdrawal from Service of Aboveground Storage Tank Systems

Part 6 contains the requirements for the closure and withdrawal from service of *aboveground storage tank systems*, either temporarily or permanently. Provisions for removal and disposal of *storage tank systems* are provided to ensure that abandoned *storage tanks* do not cause environmental problems.

Appendix A Authorities Having Jurisdiction

Appendix A lists the addresses, telephone, and FAX numbers for the various federal, provincial, and territorial *authorities having jurisdiction*.

Appendix B Explanatory Material

Appendix B contains explanations to assist the user in understanding these Code requirements. The numbering system used in the Appendix corresponds with the appropriate Article in this Code.

Appendix C Minimum Information Required for Registration of Aboveground Storage Tank Systems

For tank registration, each *authority having jurisdiction* shall request, as a minimum, the information listed in this Appendix.

Appendix D Spill Reporting Telephone Numbers

Appendix D lists the federal, provincial, and territorial telephone numbers for reporting environmental emergencies.

Part 1
Application and Definitions

Section 1.1 Application

1.1.1 Unless otherwise specified, the *owner* of an *aboveground storage tank system* shall comply with the provisions of this Code.

1.1.2 Except as provided in Article 1.1.3, this Code applies to all outside *aboveground storage tank systems* used for storage of *petroleum products*.

1.1.3 This Code does not apply to *storage tank systems* containing crude oil or areas in refineries or *process plants*.

Section 1.2 Equivalents

1.2.1 The provisions of this Code are not intended to limit the appropriate use of materials, systems, equipment and procedures not specifically described herein.

1.2.2 Materials, systems, equipment, and procedures not specifically described herein, or which vary from specific requirements in this Code, or for which no recognized test procedure has been established, are permitted to be used if it can be shown that these alternatives are equivalent on the basis of tests, evaluations or past performance.

Section 1.3 Alternate Test Standards

1.3.1 The results of tests based on test standards other than those described in this Code may be used provided that a standards development organization, accredited by the Standards Council of Canada or the *authority having jurisdiction*, has *certified* that such alternate test standards will provide comparable results.

Section 1.4 Alternatives

1.4.1 Alternatives to requirements in this Code are permitted if the *authority having jurisdiction* is satisfied that these alternatives provide a level of environmental protection that is equivalent to the standard of performance required by this Code.

Section 1.5 Definitions

1.5.1 Words and phrases that are not included in the list of defined terms in this Part shall have the meanings that are commonly assigned to them in the context in which they are used in this Code, taking into account the specialized use of terms by various trades and professions to which the terminology applies.

1.5.2 The words and terms that are in *italics* in this Code shall have the following meanings unless otherwise indicated by the context.

Aboveground storage tank means a *storage tank* with more than 90% of the *storage tank* volume above surface grade and that operates at atmospheric pressure plus or minus 10 kPa.

Aboveground storage tank system means one or more *aboveground storage tanks* with all connecting *piping*, both aboveground and underground, including pumps and product transfer apparatus, diking, overfill protection equipment, and associated *spill* containment and collection apparatus.

Alter or *alteration* means to enlarge, reduce, refurbish, upgrade, or remove a *storage tank system*.

Authority having jurisdiction means the federal, provincial, or territorial officer(s) with the legal authority to regulate the *aboveground storage tank systems* in the area of interest. (See Appendix A.)

Cathodic protection or *cathodically protected* means a method of preventing or reducing corrosion of a metal surface by making the metal a cathode by using either an impressed direct current or attaching sacrificial anodes.

Certified means, when used in reference to a *storage tank*, component, or accessory, that the product has been investigated by Underwriters' Laboratories of Canada and found to comply with its requirements, and is being produced under its follow–up service program and identified with its authorized marking.

Combustible liquid means any liquid having a closed cup *flash point* at or above 37.8^{O}C and below 93.3^{O}C.

Contingency plan means planned procedures for reporting, containing, removing, and cleaning up a *spill* or *leak*.

Corrosion expert means a person recognized by the National Association of Corrosion Engineers (NACE) as a corrosion engineer or a registered professional engineer experienced in corrosion protection.

Day means any continuous 24–hour period.

Discharge means releasing, *spilling*, *leaking*, pumping, pouring, emitting, *emptying,* or dumping of *petroleum products* into the environment, whether intentional or unintentional.

Dispenser sump means a container, located underneath or near a dispenser or self–contained suction pump, that collects or contains *leaks*.

Drum means a container with a capacity of less than 230 L but more than 30 L.

Empty means to remove the contents of an *aboveground storage tank system* as far as is practicable by such means as draining, suction, pouring, or pumping.

Existing means that which was in place or commenced operation before the effective date of this Code.

Flammable liquid means any liquid having a closed cup *flash point* below 37.8^{O}C and a vapour pressure not exceeding 275.8 kPa (absolute) at 37.8^{O}C.

Flash point means the minimum temperature at which a liquid within a container gives off vapour in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Fuel oil means kerosine or any hydrocarbon oil as classified in CAN/CGSB–3.2–M89, "Fuel Oil, Heating" and CAN/CGSB–3.3–M89, "Kerosine".

Handling means the storing, transmitting, transporting, or distributing of *petroleum products*, and includes putting *petroleum products* into the fuel tank of a motor vehicle, aircraft, or vessel, or into a container.

Impermeable barrier means a *storage tank* wall, synthetic membrane liner, prepared soil layer, concrete, or other material in conformance with Article 1.4.1.

Internal lining means a coating of a non–corrodible material bonded firmly to the interior surface of the tank that does not chemically or physically degrade when in contact with the *petroleum products* stored.

Interstitial space means the space between the two walls or barriers within a *secondary containment system*. (See Appendix B, note B.1.5.2.)

Leak means any loss of *petroleum products* because of a defect in the *aboveground storage tank system*.

Leak detection means a device or method that is capable of detecting *leaks* in *storage tanks* and *piping*.

Level 1 leak detection means a device or method that is capable of detecting *leaks* of 0.38 L/h with a probability of detection of 0.95 and a probability of false alarm of 0.05.

Level 2 leak detection means a device or method that is capable of detecting a *leak* of 0.76 L/h with a probability of detection of 0.95 and a probability of false alarm of 0.05.

Level 3 leak detection means a device or method used in pressure *piping* that operates whenever the submersible pump starts up, and that is capable of detecting a *leak* of 12 L/h with a probability of detection of 0.95 and a probability of false alarm of 0.05.

Level 4 leak detection means a device or method that is capable of detecting a *leak* with a probability of detection of 0.95 and a probability of false alarm of 0.05:

(a) before the monitoring sump or *interstitial space* fills to 50% of its capacity by volume, or
(b) before 600 L has *leaked*, whichever comes first.

Line–leak detector means a device used in pressure *piping* systems to detect a *leak* in the *piping*.

Motive fuel means any fuel used to power a vehicle, aircraft, or vessel.

Oil layer means a layer of *petroleum products* that accumulate in an *oil–water separator*.

Oil–water separator means a device for separating *petroleum products* from a *petroleum product*/water mix.

Operator means the person who is responsible for the day–to–day operation of an installation where *aboveground storage tanks* are located, or when referring to a vehicle, the driver in charge of the vehicle.

Overfill–protection device means a mechanical and/or electrical device that is installed in an *aboveground storage tank* or vent and helps to prevent a *storage tank* from being overfilled while product is being transferred to the *storage tank*.

Owner means an institution, corporate entity, government department or agency, or a person who has legal ownership rights or has been assigned the custody to control, care for, manage, or dispose of the *aboveground storage tank system*. For the purposes of this Code, the *owner* of the lands in or on which an *aboveground storage tank system* is located shall be deemed to be the *owner* of the *storage tank system*, unless the *owner* of the land satisfies the *authority having jurisdiction* to the contrary.

Petroleum product means a single product or mixture of at least 70% hydrocarbons, refined from crude oil, with or without additives, that is used, or could be used, as a fuel, lubricant, or power transmitter. Without restricting the foregoing, such products include gasoline, diesel fuel, aviation fuel, kerosine, naphtha, lubricating oil, *fuel oil*, and engine oil (including *used oil*), and exclude propane, paint, and solvents.

Piping includes all pipes, fittings, and valves necessary for safe *handling* and storage of a *petroleum product* in an *aboveground storage tank system*.

Process plant means an industrial facility where materials, including *flammable liquids, combustible liquids*, or compressed gases, are produced or used in a process. For the purposes of this Code, a diesel electric power plant is not a *process plant*.

Product transfer area means the area around loading and unloading racks or where *petroleum product* enters or leaves the fuel–*handling* system at a bulk plant, terminal, or other *storage tank system* having a capacity of greater than 50 000 L. It does not include the area around the fuel–dispensing equipment at a service station or other *motive fuel* outlet.

Secondary containment means containment that prevents *leaks* and *spills* from the primary *storage tank system* from reaching outside the containment area. It includes double–wall *aboveground storage tanks* and *piping*, and *impermeable barriers*.

Site means a lot or property where there is one or more *aboveground storage tank systems* within 200 m of each other and all tanks on the property are owned by the same *owner*(s).

Sludge means the *petroleum product* residue or inorganic material that accumulates at the bottom of an *oil–water separator*.

Spill means any loss of *petroleum products* from an *aboveground storage tank system* during product transfer or maintenance.

Storage tank means a closed container with a capacity of more than 230 L that is designed to be installed in a fixed location.

Storage tank system means an *aboveground storage tank system*.

Tank bottom water means water that accumulates at the bottom of a *storage tank* and is drained from the tanks periodically to minimize product contamination and *storage tank* corrosion. Sources of this water include: rainwater that *leaks* into *storage tanks* equipped with an external floating roof; ballast water that mixes with *petroleum product* shipped in tankers without dedicated ballast water compartments; water entrained in the *petroleum product* during processing or storage at the refinery; and condensation.

Used oil means oil from industrial and non–industrial sources that has been acquired for lubricating or other purposes and has become unsuitable for its original purpose due to the presence of impurities or the loss of original properties (see Appendix B, note B.1.5.2). *Used oil* does not include oils derived from animal or vegetable fats, crude oil or *fuel oils* spilled onto land or water, and wastes from petroleum–refining operations. The following categories of *used oil* are covered by this Code:

(a) lubricating oils (engine, turbine, or gear);
(b) hydraulic fluids (including transmission fluids); and
(c) insulating oils.

Section 1.6 Referenced Documents

1.6.1 When there is a conflict between the provisions of this Code and those of a referenced document, the provisions of this Code shall apply.

1.6.2 Unless otherwise specified herein, the documents referenced in this Code shall include the latest editions, amendments, and supplements.
1.6.3 When documents are referenced in this Code, they shall be those editions specified in Table 1.

Table 1 Referenced Documents

Issuing Agency/ Document Number	Title
American Petroleum Institute	
API Recommended Practice 651	Cathodic Protection of Aboveground Petroleum Storage Tanks
API Recommended Practice 652	Lining of Aboveground Petroleum Storage Tank Bottoms
API Standard 650	Welded Steel Tanks for Oil Storage
API Standard 653	Tank Inspection, Repair, Alteration and Reconstruction
API Standard 2610	Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities

Table 1 Referenced Documents (continued)

Issuing Agency/ Document Number	Title
Canadian Council of Ministers of the Environment	
CCME–EPC/TRE–30E	Environmental Code of Practice for Vapour Recovery in Gasoline Distribution Networks – 1991

CCME–EPC–87E	Environmental Guideline for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks – 1994
CCME–EPC–CS34	Interim Canadian Quality Criteria for Contaminated Sites

Canadian General Standards Board

CAN/CGSB–3.2–M89	Fuel Oil, Heating
CAN/CGSB–3.3–M89	Kerosine

Canadian Petroleum Products Institute

CPPI/PACE Report 87–1	Guideline Specification for the Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks
CPPI (1990)	Using the CPPI Colour–Symbol System to Mark Equipment and Vehicles for Product Identification
CPPI (1992)	The Petroleum Products Professional Driver's Manual

Canadian Standards Association

CAN/CSA–B139–M91	Installation Code for Oil Burning Equipment
CAN/CSA–B140.0	General Requirements for Oil Burning Equipment

Table 1 Referenced Documents (continued)

Issuing Agency/ Document Number	**Title**

National Research Council

NRCC 30621	National Fire Code of Canada (NFC) – 1990

Underwriters' Laboratories of Canada

ULC–S601–93 Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids

CAN/ULC–S601(A) Shop Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids

CAN/ULC–S602–92 Standard for Aboveground Steel Tanks for Fuel Oil and Lubricating Oil

CAN/ULC–603.1–92 Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids

CAN/ULC–S616–1981 Standard for the Testing of Liquid Protective Coating Materials as Required by ULC–S603.1 for Use in Connection with the Corrosion Protection of Underground Tanks

ULC–S630–93 Standard for Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids

CAN/ULC–S630(A) Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids

ULC–S652–93 Standard for Tank Assemblies for Collection of Used Oil

ULC–S653–94 Standard for Aboveground Steel Contained Tank Assemblies for Flammable and Combustible Liquids

ULC/ORD–C58.9–1993 Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks

Table 1 Referenced Documents (continued)

Issuing Agency/ Document Number	Title
Underwriters' Laboratories of Canada (continued)	
ULC/ORD–C58.12–1992	Leak Detection Devices (Volumetric Type) for Underground Flammable Liquid Storage Tanks
ULC/ORD–C58.14–1992	Nonvolumetric Leak Detection Devices for Underground Flammable Liquid Storage Tanks
ULC/ORD–C58.15–1992	Overfill Protection Devices for Flammable Liquid Storage Tanks
ULC/ORD–C107.4–1992	Ducted Flexible Piping Systems for Flammable and Combustible Liquids
ULC/ORD–C107.7–1992	Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids
ULC/ORD–C107.12–1992	Line Leak Detection Devices – Flammable Liquid Piping
ULC/ORD–C107.19–1992	Secondary Containment of Underground Piping for Flammable and Combustible Liquids
ULC/ORD–C107.21–1992	Under–Dispenser Sumps
ULC/ORD–C142.3–1991	Contained Steel Aboveground Tank Assemblies for Flammable Liquids
ULC/ORD–C142.5–1992	Concrete Encased Steel Aboveground Tank Assemblies for Flammable and Combustible Liquids
ULC/ORD–C142.16–1994	Protected Aboveground Tank Assemblies for Flammable and Combustible Liquids
ULC/ORD–C142.19–1992	Spill Containment Devices for Aboveground Flammable Liquid Storage Tanks
ULC/ORD–C142.23–1991	Aboveground Waste Oil Tanks

Section 1.7 Abbreviations

1.7.1 The abbreviations used in this Code for the names of associations or other codes shall have the meanings assigned to them in this Article. The addresses of the associations or code–sponsoring organizations are given in brackets.

API American Petroleum Institute (1220 L Street N.W., Washington, D.C. 20005. Phone: 202–682–8375 FAX: 202–682–8537)

CAN National Standards of Canada.

CCME Canadian Council of Ministers of the Environment (326 Broadway, Suite 400, Winnip

CGSB Canadian General Standards Board (1402–222 Queen Street, Ottawa, Ontario K1A 1G6. Phone: 613–941–8640 FAX: 613–956–4716)

CPPI (PACE) Canadian Petroleum Products Institute (1000 – 275 Slater Street, Ottawa, Ontario K1P 5H9. Phone: 613–232–3709 FAX: 613–236–4280) (formerly known as **PACE—**Petroleum Association for Conservation of the Canadian Environment)

CSA Canadian Standards Association (178 Rexdale Blvd., Rexdale, Ontario M9W 1R3. Phone: 416–747–4363 FAX: 416–747–4149)

EPA U.S. Environmental Protection Agency, Office of Underground Storage Tanks (401 M Street S.W., Mailing – 05400WF, Washington, D.C. 20460. Phone: 703–308–8850 FAX: 703–308–8505)

NACE National Association of Corrosion Engineers International (1440 South Creek Drive, P.O. Box 218340, Houston, Texas 77218. Phone: 713–492–0535 FAX: 713–492–8254)

NFC National Fire Code of Canada, published under the auspices of the National Research Council of Canada (National Research Council of Canada, Ottawa, Ontario K1A 0R6. Phone: 613–993–2463 FAX: 613–954–5984)

ULC Underwriters' Laboratories of Canada (7 Crouse Road, Scarborough, Ontario M1R 3A9. Phone: 416–757–3611 FAX: 416–757–9540)

1.7.2 The following abbreviations are used in this Code:

cm	centimetre(s)
^{o}C	degree(s) Celsius
h	hour(s)
kPa	kilopascal(s)
L	litre(s)
m	metre(s)
min	minute(s)
mL	millilitre(s)
mm	millimetre(s)
mV	millivolt(s)
s	second(s)
_m	micrometre(s) or micron(s)

Part 2
Registration and Approval to Construct Aboveground Storage Tank Systems

Section 2.1 Scope

2.1.1 This Part applies to the registration of all *aboveground storage tank systems* containing *petroleum products* and having a single or total capacity of more than 4 000 L at a *site*.

Section 2.2 Registration of Existing Storage Tank Systems

2.2.1 The *owner* of any *existing aboveground storage tank system* having a single or total capacity of more than 4 000 L shall register all *storage tanks* of the system with the *authority having jurisdiction* in a manner and time frame specified by the *authority having jurisdiction*. (See Appendix B, note B.2.2.1.)

2.2.2 The registration of an *existing storage tank system* shall be conducted by completing and filing a registration form in a manner and time frame prescribed by the *authority having jurisdiction*. (See Appendix B, note B.2.2.2 and Appendix C.)

2.2.3 The *owner* of an *existing aboveground storage tank system* shall identify the registered *storage tank system* with a tag, registration certificate, or other format in the time frame specified by the *authority having jurisdiction.* (See Appendix B, note B.2.2.3.)

Section 2.3 Approval to Construct Storage Tank Systems

2.3.1 No person shall construct or cause to construct, install, or operate a *storage tank system* without first completing and filing an application for approval to construct a *storage tank system* in a manner prescribed by the *authority having jurisdiction*. (See Appendix B, note B.2.2.2.)

2.3.2 No person shall construct, cause to construct, install or operate an *aboveground storage tank system* unless approval has been obtained from the *authority having jurisdiction*.

Section 2.4 Registration of New Storage Tank Systems

2.4.1 The *owner* of a new *aboveground storage tank system* having a single or total capacity of more than 4 000 L installed after a date specified by the *authority*

having jurisdiction shall register the *storage tank system*. (See Appendix B, note B.2.2.1)

2.4.2 The new *storage tank system* shall be registered by completing and filing a registration form in a manner and time frame prescribed by the *authority having jurisdiction*. (See Appendix B, note B.2.2.2.)

2.4.3 The *owner* of a new *aboveground storage tank system* shall identify the registered *storage tank system* with a tag, registration certificate or other format in the time frame as specified by the *authority having jurisdiction*. (See Appendix B, note B.2.2.3.)

Section 2.5 Product Supply and Registration

2.5.1 After a date prescribed by the *authority having jurisdiction*, no person shall transfer, or cause to be transferred, *petroleum products* to an *aboveground storage tank system* that should be registered in conformance with Articles 2.2.1 and 2.4.1 unless the *storage tank system* has been registered with the *authority having jurisdiction*. (See Appendix B, note B.2.2.1.)

Part 3
Design and Installation of New Aboveground Storage Tank Systems

Section 3.1 Scope

3.1.1 This Part applies to the design and installation of all new *aboveground storage tank systems* containing *petroleum products*.

Section 3.2 General Requirements

3.2.1 Except as provided in this Part, the design and installation of *aboveground storage tank systems* shall be in conformance with NFC, Part 4.

3.2.2 Except as provided in this Part, the design and installation of *aboveground storage tank systems* connected to an oil–burning appliance and equipment that come within the scope of CAN/CSA B139, "Installation Code for Oil Burning Equipment" shall be in conformance with that Code.

3.2.3 All *storage tanks*, components, and accessories for which there is either a ULC Standard or Other Recognized Document (ORD) shall be *certified* by ULC.

3.2.4 A company or individual that is authorized by the applicable provincial or territorial *authority having jurisdiction* shall verify that the design and installation of an *aboveground storage tank system* meets the requirements of this Code or other requirements as dictated by the *authority having jurisdiction*.

3.2.5 *Storage tanks* shall be designed and built to control emissions of volatile organic compounds in conformance with CCME–EPC–87E, "Guideline for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks". (See Appendix B, note B.3.2.5.)

Section 3.3 Field–erected Storage Tank Systems

3.3.1(1) Field–erected *aboveground storage tanks* shall:

(a) conform to API Standard 650, "Welded Steel Tanks for Oil Storage"; and
(b) have a *secondary containment* system.

3.3.2(1) A *secondary containment* system shall be:

(a) a single–wall and single–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*.

3.3.3 *Secondary containment* shall be in conformance with Section 3.8.

3.3.4 Monitoring the *interstitial space* of the *secondary containment* system for *petroleum product* in conformance with this Code shall be provided. (See Appendix B, notes B.3.3.4 and B.3.10.)

3.3.5(1) The *owner* of a field–erected *aboveground storage tank* shall ensure that the following overfill–protection systems are in place:

(a) for pipeline delivery, an alarm system that will automatically alert pipeline or terminal personnel so that action can be taken to prevent the *storage tank* from being overfilled; and
(b) for truck, rail, ship, or barge delivery, a visual and audible alarm system for detecting a high level that will activate and alert personnel in enough time to terminate the flow of the product to the *storage tank* and prevent an overfill. (See Appendix B, note B.3.3.5(1)(b).)

3.3.6 If vapour balancing or vapour recovery systems are required, they shall be designed and built in conformance with CCME–EPC/TRE–30E, "Environmental Code of Practice for Vapour Recovery in Gasoline Distribution Networks".

3.3.7 *Tank bottom water* shall not be drained onto the ground and it shall be segregated from rainwater and disposed of in conformance with the applicable provincial or territorial regulations, guidelines and policies. (See Appendix B, note B.3.3.7.)

Section 3.4 Shop–fabricated Storage Tank Systems

3.4.1 Shop–fabricated *aboveground storage tanks* having a single or total capacity of more than
4 000 L shall have a *secondary containment* system in conformance with Section 3.8. (See Appendix B, note B.2.2.1.)

3.4.2 Monitoring the *interstitial space* of the *secondary containment* system for *petroleum product* in conformance with this Code shall be provided. (See Appendix B, notes B.3.3.4 and B.3.10.)

3.4.3(1) Except as provided in Sentences (2) and (3), shop–fabricated *storage tanks* shall be provided with overfill protection in the form of:

(a) a system that, upon detecting high levels in the *storage tanks*, will automatically close a valve on the product supply line and/or shut off the pump to terminate the flow of *petroleum product*;
(b) an *overfill protection device,* compatible with the intended method of filling, designed, built, and *certified* in conformance with ULC/ORD–C58.15, "Overfill Protection Devices for Flammable Liquid Storage Tanks"; or
(c) a system that, upon detecting high levels in the *storage tanks,* will activate an audible and visual alarm at a location where personnel are constantly on duty during the product transfer operation and can promptly stop or divert the flow.

(2) In addition to the options provided in Sentence (1), shop–fabricated *storage tanks* having a capacity of 50 000 L or less may be provided with overfill protection in the form of:

(a) a level gauge on the *storage tanks* that is frequently monitored by trained employees in constant attendance throughout the transfer operation and who are located so as to be able to promptly shut down the flow, or communicate immediately with the person controlling the delivery so that flow can be promptly shut down. (See Appendix B, note B.3.4.3(2).)

(3) In addition to the options provided in Sentence (1) and Sentence (2), shop–fabricated *storage tanks* having a capacity of 4 000 L or less may be provided with overfill protection in the form of:

(a) visual monitoring and gauging of the level of *petroleum product* in the *storage tanks* by trained employees in constant attendance throughout the transfer operation and who are located so as to be able to promptly shut down the flow, or communicate immediately with the person controlling the delivery so that flow can be promptly shut down.

3.4.4 *Tank bottom water* shall not be drained onto the ground and it shall be segregated from rainwater and disposed of in conformance with the applicable provincial or territorial regulations, guidelines and policies. (See Appendix B, note B.3.3.7.)

3.4.5 Horizontal *storage tanks* shall be supported above grade level.

3.4.6(1) All *storage tank piping* located below the product level shall be equipped with either a manual or automatic shut–off valve at the *storage tank.*

(2) Except as provided in Sentence (3), manual shut–off valves shall be locked and maintained in the closed position when the facility is unattended.

(3) Manual shut–off valves that are on the *piping* connecting a *storage tank* and a heating appliance or a stationary combustion engine do not need to be locked and maintained in the closed position when the facility is unattended.

Section 3.5 Installation

3.5.1 *Aboveground storage tank systems* shall be installed by a company or individual that is authorized by the provincial or territorial *authority having jurisdiction.*

3.5.2(1) Installers of all shop–fabricated *aboveground storage tank systems* shall ensure that the *storage tank systems* are installed in conformance with all requirements of Part 3 of this Code. (See Appendix B, note B.3.5.2(1).)

(2) Fabricators of all field–erected *aboveground storage tank systems* shall ensure that the *storage tank systems* are built in conformance with all requirements of Part 3 of this Code.

3.5.3(1) A shop–fabricated *aboveground storage tank* that is structurally damaged shall not be repaired and used for storage of a *petroleum product* unless the repair is done in conformance with the technical requirements of, or the intent of:

(a) CAN/ULC–S601(A), "Shop Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids";
(b) CAN/ULC–S630(A), "Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids";
(c) API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction" as applicable; or
(d) the special acceptance procedures of ULC.

3.5.4(1) A shop–fabricated *aboveground storage tank* that is relocated may be reused aboveground for the storage of *petroleum products* if inspected and tested in accordance with:

(a) CAN/ULC–S601(A), "Shop Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids";
(b) CAN/ULC–S630(A), "Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids"; or
(c) the special acceptance procedures of ULC.

(2) Field–erected *storage tanks* that are reconstructed or relocated shall be:

(a) erected and tested in conformance with API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction"; and
(b) endorsed by a professional engineer as meeting the requirements of clause (a).

3.5.5(1) The *owner* shall provide an as–built drawing to the *authority having jurisdiction* in the manner and time frame as specified by the *authority having jurisdiction*.

(2) New installations shall include the preparation of an as–built drawing that shows:

(a) the outline of all *storage tanks*;
(b) the centreline of all *piping* (or pipe groups);
(c) the centreline of all underground electrical and monitor sensor conduit;
(d) building foundation outlines; and
(e) property lines.

Section 3.6 Corrosion Protection of Steel Aboveground Storage Tank Systems

3.6.1(1) When *cathodic protection* is used, it shall be:

(a) installed in conformance with API RP 651, "Cathodic Protection of Aboveground Petroleum Storage Tanks"; or
(b) designed by a *corrosion expert*. (See Appendix B, note B.3.6.1)

Section 3.7 Secondary Containment Requirements (see Appendix B, note B.3.7)

3.7.1(1) *Aboveground storage tanks* with *secondary containment* shall conform to one of the following:

(a) ULC–S653, "Standard for Aboveground Steel Contained Tank Assemblies for Flammable and Combustible Liquids";
(b) ULC/ORD–C142.16, "Protected Aboveground Tank Assemblies for Flammable and Combustible Liquids";
(c) ULC/ORD–C142.3, "Contained Steel Aboveground Assemblies for Flammable Liquids" (see Appendix B, note B.3.7.1(1)(c));
(d) ULC/ORD–C142.5, "Concrete Encased Steel Aboveground Tank Assemblies for Flammable and Combustible Liquids" (see Appendix B, note B.3.7.1(1)(d));
(e) ULC–S601, "Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids", Section 4;
(f) ULC/ORD–C142.23, "Aboveground Waste Oil Tanks";

(g) ULC–S652, "Standard for Tank Assemblies for Collection of Used Oil"; or

(h) a single–wall and single–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.

3.7.2(1) Underground *secondary containment piping* shall:

(a) be constructed and installed in conformance with ULC/ORD–C107.7, "Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids";

(b) be constructed and installed in conformance with ULC/ORD–C107.4, "Ducted Flexible Piping Systems for Flammable and Combustible Liquids";

(c) consist of a single–wall *piping* contained within a synthetic membrane liner manufactured and installed in conformance with ULC/ORD–C58.9, "Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks"; or

(d) consist of a single–wall fibreglass–reinforced plastic, or single–wall steel *piping*, contained within a duct designed, constructed, and installed in conformance with ULC/ORD–C107.19, "Secondary Containment of Underground Piping for Flammable and Combustible Liquids".

3.7.3(1) In addition to NFC, Subsection 4.3.7, *secondary containment impermeable barriers* shall conform to the following performance specifications:

(a) ULC/ORD–C58.9, "Secondary Containment Liners for Underground and Aboveground Flammable and Combustible Liquid Tanks" using material compatible with the product being stored and installed so that:

(i) product entering the *interstitial space* flows to a containment sump; and

(ii) the liner is sealed to the perimeter of the *storage tanks* or pad when the liner is not installed under the tank;

(b) Concrete barriers shall:

(i) be designed and installed according to good engineering practices to meet the expected loads without fracture;

(ii) have expansion joints located at least every 6 m;

(iii) have expansion joints sealed with a sealant that is compatible with the product being stored;

(iv) be graded to allow collection of liquids in the *interstitial space*.

(c) Clay barriers shall:

(i) be installed in accordance with good engineering practice (see Appendix B, note B.3.7.3(1)(c)(i));
(ii) be a minimum of 300 mm thick;
(iii) be chemically compatible with native or cover soil;
(iv) be covered with a minimum of 300 mm of material to prevent dryout; and
(v) be graded to allow liquid to collect in the *interstitial space*.

(d) Steel barriers shall:

(i) be a minimum of 4.5 mm thick;
(ii) have corrosion protection designed and installed under the direction of a *corrosion expert*; and
(iii) be sloped to allow liquid to collect in the *interstitial space*.

(2) *Secondary containment impermeable barriers* shall have a sustained permeability to water less than 1×10^{-6} cm/s under a hydraulic head of 3 m.

3.7.4 *Spills*, overfills, and storm runoff water shall be contained, treated, and disposed of in conformance with the applicable provincial or territorial regulations, guidelines and policies.

3.7.5(1) Liner penetrations must be located at the high point or in a raised part of the dike floor. (See Appendix B, note B.3.7.5(1).)

(2) All liner penetrations must be sealed.

Section 3.8 Used Oil Tank Systems

3.8.1(1) *Used oil storage tanks* that are manually filled shall conform to:

(a) ULC/ORD–C142.23, "Aboveground Waste Oil Tanks"; or
(b) ULC–S652, "Standard for Tank Assemblies for Collection of Used Oil".

(2) *Used oil storage tanks* that are not manually filled shall conform to ULC–S652, "Standard for Tank Assemblies for Collection of Used Oil". (See Appendix B, note B.3.8.1.)

Section 3.9 Piping

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

3.9.2 Underground *piping* which is part of a *motive fuel aboveground storage tank system* shall be designed and installed to have *level 4 or levels 2 and 3 leak detection* in conformance with Section 3.10.

3.9.3(1) 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 NFC every two years beginning in the fifth year of operation (see Appendix B, note B.3.10); or
(c) *leak detection* in conformance with Section 3.10.

3.9.4 Fibreglass–reinforced plastic *pipe* and fittings may be used for the primary *pipe* in underground service provided the *pipe* and fittings are designed, constructed, and *certified* in conformance with ULC/ORD–C107.7, "Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids".

3.9.5 Flexible *pipe* and fittings may be used for the primary *pipe* in underground service provided the *pipe* and fittings are designed, constructed, and *certified* in conformance with ULC/ORD–C107.4, "Ducted Flexible Piping Systems for Flammable and Combustible Liquids".

3.9.6 At the connection point between the *storage tank system* and the delivery truck, rail car, or vessel, means shall be provided to collect any *spill* that may occur during or upon completion of product transfer. (See Appendix B, note B.3.9.6.)

3.9.7 Primary *piping* shall not have buried mechanical joints. (See Appendix B, note B.3.9.7.)

3.9.8 Thermal relief valves shall *discharge* into the low pressure side of the *piping*.

3.9.9 Steel underground *piping* shall have a *cathodic protection* system designed by a *corrosion expert*.

Section 3.10 Leak Detection for Underground Piping (see Appendix B, note B.3.10)

3.10.1(1) Except as provided in this Section, *leak–detection* devices or methods shall be designed, built, *certified*, and operated in conformance with one of the following:

(a) ULC/ORD–C58.14, "Nonvolumetric Leak Detection Devices for Underground Flammable Liquid Storage Tanks";

(b) ULC/ORD–C58.12, "Leak Detection Devices (Volumetric Type) for Underground Flammable Liquid Storage Tanks" and, as a minimum, provide *level 3* or *level 4 leak detection*; or
(c) the specifications of the *authority having jurisdiction.*

3.10.2 The certification organization shall specify whether the evaluated *leak–detection* device or method meets the performance of *level 2*, *level 3, or level 4 leak detection*.

3.10.3(1) Groundwater monitoring wells shall be considered to provide *level 2 leak detection* for *piping* larger than 75 mm nominal diameter if they are designed and installed in conformance with:

(a) the groundwater monitoring requirements outlined in Section 3.13;
(b) the specifications provided by a hydrogeologist or other person experienced in the design of monitoring wells; or
(c) the specifications of the *authority having jurisdiction.*

3.10.4(1) Vapour monitoring wells shall be considered to provide *level 2 leak detection* for *piping* larger than 75 mm nominal diameter if they are designed and installed in conformance with:

(a) the vapour monitoring requirements outlined in Section 3.14;
(b) the specifications provided by a hydrogeologist or other person experienced in the design of vapour monitoring wells; or
(c) the specifications of the *authority having jurisdiction.*

3.10.5 When *level 2 leak detection* is used, it shall be conducted at least monthly.

3.10.6 When *level 3 or 4 leak detection* is used, it shall be conducted continuously.

3.10.7(1) Subject to Sentence 3.10.7(2), *level 4 leak detection* shall be electrically interlocked in such a manner that:

(a) when the *leak–detection* device is activated, an audible and visual alarm shall be activated; and
(b) when the *leak–detection* device is turned off or bypassed for more than one minute, product flow shall be shut off; or
(c) when the *leak–detection* device is activated, product flow shall be shut off.

(2) When electrical interlocks required in Sentence 3.10.7(1) are not possible, the *authority having jurisdiction* shall be notified whenever the *leak–detection* device or method indicates a *leak*. (See Appendix B, note B.3.10.7(2).)

3.10.8 *Level 3 leak–detection* equipment shall be interlocked so that product flow to the dispenser or self–contained suction pump is shut off or reduced to less than 12 L/min. (See Appendix B, note B.3.10.8.)

3.10.9 *Leak–detection* alarms shall be located where the staff routinely work and in a place where such alarms can be readily heard and seen.

Section 3.11 Piers and Wharves

3.11.1 *Aboveground storage tanks* or *drums* located on a pier or wharf shall be in conformance with the requirements of the *authority having jurisdiction.*

3.11.2 *Piping* on piers and wharves shall be located so that it is not possible to use the *piping* as a cleat or tie–up point for watercraft.

Section 3.12 Containment and Collection of Spill and Storm Runoff

3.12.1(1) *Product–transfer areas* shall be paved with concrete and graded, curbed, or diked to contain *spills* or overfills that occur during the transfer process.

(2) *Spills*, overfills, and storm runoff water from the *product–transfer areas* shall be contained, treated and disposed of in conformance with the applicable provincial or territorial regulations, guidelines or policies.

3.12.2 Centrifugal–type pumps shall not be used to transfer oil–contaminated water from dikes or sumps to the collection system or oil–water separator. (See Appendix B, note B.3.12.2.)

3.12.3 Containment area floors within dikes shall be sloped away from the tank base towards a sump at a slope greater than 1%.

3.12.4(1) *Motive fuel* dispensers shall have *dispenser sumps* that are designed, built, and *certified* in conformance with ULC/ORD–C107.21, "Under–Dispenser Sumps".

(2) *Level 2 or level 4 leak detection* in conformance with Section 3.7 shall be provided for the *dispenser sump.*

3.12.5(1) An *oil/water separator* used to treat stormwater runoff from the *product transfer area*
should be:

(a) designed to produce a discharge of water that does not contain more than 15 mg/L of oil and grease as measured by the partition–gravimetric method or other protocol as defined by the *authority having jurisdiction;*

(b) sized for a hydraulic flow rate of a 10 year return, 1–hour storm event (the 1–hour rainfall intensity data should be obtained for the nearest weather station);
(c) designed for an oil with a specific gravity of 0.90;
(d) designed to capture a *spill* of *petroleum product* of a volume equal to the amount of *petroleum product* transferred in 2 minutes at the highest pumping rate normally used within the area that drains to the oil/water separator; and
(e) designed based on the hydraulic retention time required to separate oil with a particle droplet size of 60 _m (microns) from stormwater. (See Appendix B, note B.5.6.)

Section 3.13 Vertical Groundwater Monitoring Wells

3.13.1(1) When vertical groundwater monitoring wells are to be used, a hydrogeologist or other person experienced in the design of monitoring wells shall:

(a) assess the *site* and establish the number and positioning of the monitoring wells so that product releases from any portion of the *storage tank system* that routinely contains a *petroleum product* will be detected; and
(b) ensure compliance with the requirements of this Section.

3.13.2 The product stored in the *storage tank* shall have a specific gravity of less than one.

3.13.3 Groundwater monitoring wells may be used as *level 2 leak detection* only if the groundwater surface is less than 7 m from the ground surface.

3.13.4 The hydraulic conductivity of the soil between the *storage tank system* and the monitoring well shall not be less than 0.01 cm/s. (See Appendix B, note B.3.13.4.)

3.13.5 Monitoring wells shall be a minimum of 50 mm in diameter.

3.13.6(1) Subject to Sentence 3.13.8(1), if the monitoring well is eventually to be used as a recovery well, the screened zone shall extend at least 1.5 m into the water table and at least 1.5 m above the groundwater surface, as determined at the time of installation.

(2) Subject to Sentence 3.13.8(1), the screened portion of the monitoring well shall be a minimum of 3.0 m in length and shall be factory slotted with a slot size of 0.25 mm or as approved by the *authority having jurisdiction*.

3.13.7(1) The area around the screened portion of the monitoring well shall be surrounded by a filter pack. (See Appendix B, note B.3.13.7(1).)

(2) Subject to Sentence 3.13.8(1), the filter pack shall extend to 0.5 m above the top of the screened portion of the well.

(3) The outside of the monitoring wells shall be sealed from the ground surface to the top of the filter pack using bentonite, grout, or other material with equivalent performance.

3.13.8(1) Where the groundwater surface is less than 2.5 m from the ground surface, a hydrogeologist or other person experienced in the design of monitoring wells shall determine the length and position of:

(a) the screened portion of the well;
(b) the filter pack; and
(c) the bentonite or other seal.

3.13.9 Monitoring wells shall be installed with a cap at the bottom of the screened section of the well.

3.13.10 Monitoring wells shall be constructed of flush joint, threaded, or bell and spigot Schedule 40 PVC or other brands of PVC with equivalent or greater wall thickness. (See Appendix B, note B.3.13.10.)

3.13.11 If more than one monitoring well is necessary to monitor an installation effectively, the monitoring wells shall be numbered so that all monitoring and testing results can be easily correlated to a specific monitoring location.

3.13.12(1) Monitoring wells shall be equipped with liquid–proof caps.

(2) Monitoring wells shall be distinguished from fill pipes and marked in conformance with "Using the CPPI Colour–Symbol System to Mark Equipment and Vehicles for Product Identification".

(3) Monitoring wells shall be secured to prevent unauthorized access and tampering.

3.13.13 Continuous monitoring devices or manual methods shall be able to detect at least 3 mm of free product on top of the groundwater surface in the monitoring well.

3.13.14 Monitoring wells that are located in traffic areas shall be cut off at ground level and/or properly protected from vehicles.

3.13.15 Monitoring wells installed within the *interstitial space* shall not penetrate the liner.

3.13.16 Any damaged monitoring well shall be repaired or replaced within 30 *days* after discovery of the damage.

Section 3.14 Vapour Monitoring

3.14.1(1) Where vapour monitoring is to be considered *level 2 leak detection*, a hydrogeologist or other person experienced in the design of vapour monitoring systems shall:

(a) assess the *site* and establish the number and positioning of the monitoring wells so that product releases from any portion of the *storage tank system* that routinely contains a *petroleum product* will be detected; and
(b) ensure compliance with the requirements of this Section.

3.14.2 The product stored or tracer compound placed in the *storage tank system* shall be sufficiently volatile to result in a vapour level that is detectable by the monitoring devices.

3.14.3 The measurement of vapours by the monitoring device shall not be rendered inoperative by the groundwater, rainfall, soil moisture, or other known interferences so that a *leak* could go undetected for more than 30 *days*.
3.14.4 The level of background contamination shall not interfere with the method used to detect *leaks* from the *storage tank system*.

3.14.5 The vapour monitors shall have their performance validated by a third–party testing organization in conformance with the applicable protocol listed in Sentence 3.10.1(1).

3.14.6(1) The vapour monitors shall be designed and operated to detect any significant increase in concentration above the background level of:

(a) the *petroleum product* stored;
(b) a component or components of the *petroleum product*; or
(c) a tracer compound placed in the *storage tank system*.

3.14.7 If more than one monitoring well is necessary to monitor an installation effectively, the monitoring wells shall be numbered so that all monitoring and testing results shall be easily correlated to a specific monitoring location.

3.14.8(1) Vapour monitoring wells shall be equipped with liquid–proof caps.

(2) Monitoring wells shall be distinguished from fill pipes and marked in conformance with "Using the CPPI Colour–Symbol System to Mark Equipment and Vehicles for Product Identification".

(3) Monitoring wells shall be secured to prevent unauthorized access and tampering.

3.14.9 Vapour monitoring wells that are located in traffic areas shall be cut off at ground level and/or properly protected from vehicles.

3.14.10 Vapour monitoring wells installed within the *interstitial space* shall not penetrate the *liner*.

3.14.11 Any damaged monitoring well shall be repaired or replaced within 30 *days* after discovery of the damage.

Part 4
Upgrading of Existing Aboveground Storage Tank Systems

Section 4.1 Scope

4.1.1 This Part applies to all *aboveground storage tank systems* containing *petroleum products* installed before the date this Code is adopted by the *authority having jurisdiction*.

Section 4.2 General Requirements (see Appendix B, note B.4.2.)

4.2.1 No person shall *alter* or cause to *alter* a *storage tank system* with a capacity of more than
4 000 L unless approval has been obtained from the *authority having jurisdiction*.

4.2.2 Except as provided in this Part, *existing* shop–fabricated *aboveground storage tank systems* shall be upgraded to meet the requirements of Part 3 of this Code within 10 years of the date the *authority having jurisdiction* adopts this Code.

4.2.3 Overfill protection in conformance with Part 3 of this Code shall be installed on *existing storage tank systems* and be operational within 5 years of the date the *authority having jurisdiction* adopts this Code.

4.2.4 *Existing storage tanks* that are located in the Lower Fraser Valley of British Columbia, the Windsor–Quebec City corridor, the Saint John area of New Brunswick and other areas as required by the *authority having jurisdiction* shall be equipped to control emissions of volatile organic compounds in conformance with CCME–EPC–87E, "Guideline for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks". (See Appendix B, note B.3.2.5.)

Section 4.3 Field–erected Storage Tanks

4.3.1 Except as provided in this Part, *existing* field–erected *aboveground storage tank systems* shall be upgraded to meet the requirements of Part 3 of this Code within 15 years of the date the *authority having jurisdiction* adopts this Code.

4.3.2(1) Where authorized by the *authority having jurisdiction,* an *existing* field–erected *aboveground storage tank* may be exempt from adding an *impermeable barrier* to meet the *secondary containment* requirements of Part 3 of this Code provided that:

(a) either:

(i) a double bottom with *interstitial leak detection* is added to the *storage tank*; or

(ii) continuous *leak detection* is provided beneath the *storage tank*; or

(iii) best management practices are followed, as outlined in API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction". If inspection requires replacing or lining the tank bottom, then either subclause (i) or (ii) above shall be included. (See Appendix B, note B.4.3.2.)

(b) *tank bottom water* shall be segregated from rainwater and disposed of in conformance with the applicable provincial or territorial regulations, guidelines and policies;

(c) the areas under and around pumps and product transfer connection points are contained and directed to a holding tank or an *oil–water separator* so *leakage* or *spillage* cannot enter the main diked area;

(d) there is an *existing* dike in place that meets all requirements of the NFC and this Code other than the requirements for an *impermeable barrier*;

(e) all the conditions of Sentence 4.3.2(1) are met within 8 years of the date the *authority having jurisdiction* adopts this Code.

(2) In the event that a *storage tank owner* chooses the exemption provided in Clause 4.3.2(1)(a)(iii) but the *storage tank* bottom or shell becomes perforated, then all other *storage tanks* that are assumed to be in similar service for the purposes of the API inspection frequency shall also be assumed to be potentially *leaking*. Consequently, an inspection of at least 90% of the underside of the floor shall be conducted within 1 year. (See Appendix B, note B.4.3.2)

Section 4.4 Piping

4.4.1(1) *Existing* steel underground *piping* up to 75 mm nominal pipe size that is not *cathodically protected* and that is part of an aboveground *storage tank system* shall:

(a) be upgraded with *secondary containment* and *leak detection* added in conformance with Sections 3.9 and 3.10 within 10 years of the date the *authority having jurisdiction* adopts this Code; or

(b) be upgraded with *cathodic protection* in conformance with Section 3.6 and upgraded with *leak detection* in conformance with Sections 3.9 and 3.10 within 10 years of the date the *authority having jurisdiction* adopts this Code.

(2) Until the *existing steel* underground *piping* is upgraded with either *cathodic protection* or *leak detection* in conformance with Sections 3.9 and 3.10, the *piping* shall be pressure tested in conformance with the NFC every 2 years from the date the *authority having jurisdiction* adopts this Code.

4.4.2(1) *Existing* underground *piping* up to 75 mm nominal pipe size that is either *cathodically protected* steel *piping* or made of other non–corroding materials (fibreglass reinforced plastic) and that is part of an *aboveground storage tank system* shall:

(a) be upgraded with *secondary containment* and *leak detection* added in conformance with Sections 3.9 and 3.10 within 10 years of the date the *authority having jurisdiction* adopts this Code; or
(b) be upgraded with *leak detection* in conformance with Sections 3.9 and 3.10 within 15 years of the date the *authority having jurisdiction* adopts this Code.

4.4.3 *Existing* steel underground *piping* larger than 75 mm nominal pipe size that is part of an *aboveground storage tank system* shall be upgraded in conformance with Sections 3.9 and 3.10 within 5 years of the date the *authority having jurisdiction* adopts this Code.

4.4.4 When the pressure test required in conformance with Sentence 4.4.1(2) indicates a *leak,* the *piping* shall be replaced in conformance with Sections 3.9 and 3.10 prior to further operation.

4.4.5 *Existing* underground copper *piping* smaller than 25 mm nominal size shall be exempt from the requirements of this Section.

Section 4.5 Internal Lining

4.5.1 When permitted by the *authority having jurisdiction, aboveground storage tanks* may be internally lined as a means of upgrading.

4.5.2 Following an internal inspection, the tank lining company shall inform the *authority having jurisdiction* of all inspection results and perforated tanks.

4.5.3(1) When shop–fabricated *storage tanks* are internally lined, the lining shall:

(a) meet the requirements of CAN/ULC–S616, "Standard for the Testing of Liquid Protective Coating Materials as Required for ULC–

S603.1 for Use in Connection with the Corrosion Protection of Underground Tanks", and its application shall be in conformance with the lining manufacturer's installation instructions; and

(b) be installed under the direction of the lining manufacturer's representative.

(2) Field–erected *storage tanks* shall be lined in conformance with API–RP 652, "Lining of Aboveground Petroleum Storage Tank Bottoms".

Section 4.6 As–built Drawings

4.6.1(1) When a *storage tank system* is *altered*, the *owner* shall provide a revised as–built drawing to the *authority having jurisdiction* in the manner and time frame as specified by the *authority having jurisdiction*.

(2) The as–built drawing shall be in conformance with Sentence 3.5.5(2).

Part 5
Operation and Maintenance

Section 5.1 Scope

5.1.1 This Part applies to the operation and maintenance of *aboveground storage tank systems* containing *petroleum products*.

Section 5.2 Inventory Control

5.2.1 The *owner* of an *aboveground storage tank system* or the *owner's* designated representative shall ensure that the product level in an *aboveground storage tank* containing *motive fuels* is measured and reconciled at least weekly in conformance with Sentence 5.2.2(1).

5.2.2(1) *Storage tank* inventory control measurements shall be reconciled by comparing product measurements with dispenser meter readings, shipments, deliveries, and internal transfers.

(2) The computation of any gain or loss of product shall be recorded and included with a monthly summary of cumulative losses or gains of product. (See Appendix B, note B.5.2.2(1).)

5.2.3(1) The *authority having jurisdiction* shall be notified immediately in conformance with Section 5.9 when a *leak* or *discharge* is indicated by any one of the following:

(a) any unexplained loss of 1.0% or more of throughput in one month from an *aboveground storage tank* as indicated by the recording and reconciliation of inventory records done in conformance with Sentence 5.2.2(1);
(b) inventory reconciliations showing 4 or more consecutive weeks of unexplained product losses; and
(c) inventory reconciliation showing an unexplained loss in one calendar month.

Section 5.3 Inspections

5.3.1(1) Except as provided in Article 5.3.2, routine in–service inspections shall be conducted in conformance with Sentences 5.3.1(2), 5.3.1(3), and 5.3.1(4).

(2) Visual inspection of the *aboveground storage tank* facility to ensure that there has been no *leakage* or deterioration of the facility that could result in a *leak* shall be conducted either:

(a) each *day* the facility is in operation; or
(b) at a frequency specified by the *authority having jurisdiction*. (See Appendix B, note B.5.3.1(2)(b).)

(3) A shop–fabricated *aboveground storage tank system* having a capacity greater than 5 000 L shall be inspected by the *owner* or *operator* annually to assess conformance to the standards in this Code. This inspection shall be documented and shall include:

(a) for *storage tanks* in service, the tank identification number, product, capacity, foundations, tank walls, roof, protective coating, and tank attachments;
(b) dike capacity, condition of the dike wall and floor, and water removal systems;
(c) all auxiliary product–*handling* equipment;
(d) all pollution control equipment;
(e) any evidence of *leaks* or *spills*;
(f) all gauging equipment and overfill instrumentation; and
(g) integrity checks of *leak–detection* equipment.

(4) Any *storage tanks* not in service at the time of the inspection shall be noted on the inspection report stating:
(a) registered *storage tank* identification number, when last serviced, and capacity;
(b) date taken out of service; and
(c) status with respect to NFC Subsection 4.10.2.

5.3.2(1) In addition to the inspections required in Article 5.3.1, field–erected *aboveground storage tank systems* shall be inspected in conformance with API Standard 653, "Tank Inspection, Repair, *Alteration* and Reconstruction".

(2) Where the floor of the field–erected *storage tank* rests on the ground, soil or pad and the *storage tank* does not have an *impermeable barrier* beneath the floor, an inspection of at least 90% of the floor shall be conducted:

(a) within 20 years; or
(b) at the next scheduled internal inspection, whichever comes first.

5.3.3(1) Any deficiencies in the *aboveground storage tank systems* identified as a result of the inspections specified in Articles 5.3.1 and 5.3.2 shall be corrected in conformance with:

(a) CAN/ULC–S601(A), "Shop Refurbishing of Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids";
(b) CAN/ULC–S630(A), "Shop Refurbishing of Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids"; or
(c) API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction", as applicable.

5.3.4 If installed, monitoring wells shall be checked for liquid product and/or vapours at least monthly.

5.3.5(1) Overfill–protection systems that are installed in conformance with either 3.3.5(1) or 3.4.3(1) shall be routinely tested:

(a) in conformance with API Standard 2610, "Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities"; or
(b) in a manner and time frame specified by the *authority having jurisdiction.*

Section 5.4 Product Transfer Operations

5.4.1(1) Transfer of *petroleum product* into and out of a *storage tank system* shall conform to procedures outlined in the following documents:

(a) National Fire Code;
(b) API Standard 2610, "Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities"; and
(c) CPPI, "The Petroleum Products Professional Driver's Manual".

(2) Standard procedures for normal operation as well as for emergencies shall be given to *operators* and posted in printed form for convenient reference. Employees involved with the transfer of *petroleum products* shall be trained in the correct operating procedures for all equipment and shut–down devices. (See Appendix B, note B.5.4.1(2).)

5.4.2 The *owner* of a *storage tank system* shall ensure that filler ports, monitoring wells, and vapour recovery connections are colour–coded in conformance with "Using the CPPI Colour– Symbol System to Mark Equipment and Vehicles for Product Identification".

Section 5.5 Corrosion Protection Monitoring

5.5.1(1) Maintenance checks on the operation of *cathodic protection* systems shall be conducted in conformance with:

(a) CAN/ULC–S603.1, "Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids" for sacrificial anode systems;
(b) CPPI/PACE Report No. 87–1, "Guideline Specification for the Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks" Clause 5.55(c) and Part 6.0 for impressed current systems; or
(c) API RP 651, "Cathodic Protection of Aboveground Petroleum Storage Tanks".

5.5.2(1) *Cathodic protection* measurements conducted in conformance with Article 5.5.1 shall be considered satisfactory if:

(a) the measured surface potential for underground *piping* is equal to or greater than 850 mV negative using a copper/copper sulphate reference electrode; and
(b) the measured surface potential for the *aboveground storage tank* meets the criteria of a *corrosion expert.* (See Appendix B, note B.5.5.2(1)).

5.5.3 If corrosion protection monitoring conducted in conformance with this Section indicates inadequate corrosion protection, corrective measures shall be taken within 180 *days* to ensure that the measured surface potential conforms to the requirements of Article 5.5.2.

Section 5.6 Oil–water Separators (See Appendix B, note B.5.6.)

5.6.1(1) The *oil layer* and *oil layer* thickness in *oil–water separators* shall be checked and recorded monthly.

(2) After a *spill* or *leak*, the *oil layer* thickness and *sludge* levels should be checked and recorded.

5.6.2(1) *Oil–water separators* shall have the *sludge* removed:

(a) annually;
(b) whenever the *sludge* buildup exceeds 150 mm; or
(c) on a frequency based on a history of *sludge* layer monitoring, but at least every 2 years.

5.6.3 No person shall intentionally direct *petroleum products* or *motive fuels*, antifreeze, solvents, lubricants, *used oil*, or *tank bottom water* into an *oil–water separator*.

5.6.4 No person shall discharge detergents or cleaning solutions to an *oil–water separator.* (See Appendix B, note B.5.6.4.)

5.6.5(1) An *oil–water separator* shall have the *oil layer* removed:

(a) continuously by an automatic skimmer;
(b) whenever the thickness of the *oil layer* exceeds 50 mm; or
(c) on a frequency based on a history of *oil layer* monitoring, but at least every 2 years.

5.6.6 Oil, *sludge*, and water shall be disposed of in conformance with the applicable provincial or territorial regulations, guidelines and policies.

Section 5.7 Records

5.7.1(1) The *owner* of an *aboveground storage tank system* shall maintain inventory control records and reconciliation data on *site* for a period of at least 2 years for examination by the *authority having jurisdiction*.

(2) When computerized inventory reconciliation is conducted, the *authority having jurisdiction* may allow inventory control and reconciliation records to be stored off *site*.

(3) Inventory control and reconciliation records shall be kept in a manner and format as specified by the *authority having jurisdiction*.

5.7.2 When there is a change in *operator* of an *aboveground storage tank system*, the departing *operator* shall transfer the inventory control records and reconciliation data required under Sentence 5.7.1(1) to the incoming *operator*.

5.7.3(1) The *owner* of a *petroleum product storage tank system* shall maintain records of all:

(a) *cathodic protection* system checks;
(b) overfill alarm tests;
(c) *line–leak detection* system tests;
(d) *leak–detection* equipment tests and checks;
(e) excavation or nearby construction that could effect the integrity of the *storage tank system*;
(f) inspections, tests, or maintenance checks of the *storage tank system*; and
(g) *leak detection* and monitoring well results.

(2) The *owner* shall retain the records required in Sentence 5.7.3(1) for examination by the *authority having jurisdiction* for either 5 years or a period equal to the required time interval between the inspections, tests, or maintenance checks, whichever is greater.

5.7.4 The *owner* of a *petroleum product storage tank system* shall maintain a record of all *alterations* for examination by the *authority having jurisdiction* for the life of the *storage tank system*.

5.7.5 When there is a change in the *storage tank system owner*, the *owner* of records required under Sentence 5.7.1(1) and Sentence 5.7.3(1) shall transfer all such records to the new *owner*.

5.7.6(1) The *owner* of an *oil–water separator* shall maintain records of:

(a) the *oil layer* in the separator;
(b) the *sludge* level, measured at a point where maximum *sludge* buildup can be expected;
(c) the date and quantity of oil removed;
(d) the date and quantity of *sludge* removed; and
(e) the name of the contractor used in clauses 5.7.6(1)(c) and (d).

Section 5.8 Transfer of Ownership

5.8.1 The new *owner* of a *storage tank system* shall notify the *authority having jurisdiction* in writing within 30 *days* of the transfer of ownership and provide the information prescribed by the *authority having jurisdiction*.

5.8.2 When the ownership of a *storage tank system* is transferred, all as–built drawings shall be transferred to the new *owner* of the *storage tank system*.

Section 5.9 Leak and Spill Response

5.9.1 The *owner* of each registered *aboveground storage tank system* shall prepare and maintain an emergency response *contingency plan*.

5.9.2(1) The *owner* or *operator* of an *aboveground storage tank system* shall immediately notify the *authority having jurisdiction* by telephone and provide the information requested by the *authority having jurisdiction* when the *owner* or *operator* discovers, suspects, or is notified by any person of (see Appendix D):

(a) any *spill*, *leak*, or overfill of *petroleum product* that is more than 100 L; or
(b) any *leak* or *spill* that could reasonably threaten fresh water supplies, groundwater, or the health and safety of the public.

5.9.3(1) The *owner* of a *storage tank system* where a *leak* or *spill* is known or suspected, in consultation with the *authority having jurisdiction*, shall take such actions as the *authority having jurisdiction* requires to verify, stop, clean up, and mitigate the impact of the *leak* or *spill*. This includes but is not limited to the following requirements:

(a) arrange for immediate removal of the *petroleum product* from the isolated *leaking* components of the *storage tank system*;
(b) inspect the *storage tank*, conduct a *leak* test, or remove the *storage tank*;
(c) take all reasonable steps to establish the extent of the contamination (including vapours), contain the *leaked petroleum product*, and prevent its further migration; and
(d) take all reasonable steps to recover or remove escaped *petroleum product*.

Part 6
Withdrawal from Service of Aboveground Storage Tank Systems

Section 6.1 Scope

6.1.1 This Part applies to the procedures to be followed when *aboveground storage tank systems* for *petroleum products* are removed, relocated, disposed of, refurbished, or temporarily taken out of service.

Section 6.2 General Requirements

6.2.1 Except as provided in this Part, the withdrawal from service and removal of *aboveground storage tank systems* shall be in conformance with the NFC, Section 4.10.

6.2.2 *Aboveground storage tank systems* shall be removed by a company or individual that is authorized by the *authority having jurisdiction.*

6.2.3 A company or individual removing *aboveground storage tank systems* shall ensure that the system is removed in conformance with all the requirements of this Part.

Section 6.3 Temporary Withdrawal from Service

6.3.1 When the *storage tank system* uses an impressed current *cathodic protection* system, the *owner* shall ensure that this system is maintained and operated while the *storage tank system* is being withdrawn from service. (See Appendix B, note B.6.3.1.)

6.3.2(1) Subject to Sentence 6.3.2(2), *aboveground storage tank systems* with a capacity of less than 50 000 L shall pass an annual inspection in conformance with Sentence 5.3.1(3) before the *storage tank system* is returned to service.

(2) Field–erected *aboveground storage tanks* that have been out of service for more than 1 year shall pass an internal inspection conducted by a *corrosion expert* in conformance with API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction" before the *storage tank system* is returned to service.

6.3.3(1) Except for *aboveground storage tank systems* that have been registered with the *authority having jurisdiction* as operating on a seasonal basis, when a *storage tank system* is to be out of service for more than 180 *days*, the *owner* or *operator* shall notify the *authority having jurisdiction* in writing within seven

days after the *storage tank system* goes out of service, providing the following information:

(a) the name and mailing address of the *owner*;
(b) the name and mailing address of the *operator*;
(c) the location of the *storage tank system*;
(d) a description of the nature and quantity of the contents; and
(e) the registration number of the *storage tank*.

Section 6.4 Permanent Removal from Service

6.4.1 The *owner* of an *aboveground storage tank system* shall notify the *authority having jurisdiction* and provide the information requested within 30 *days* of the decision to permanently remove the *storage tank*.

6.4.2(1) When an *aboveground storage tank system* has been permanently removed from service, the *owner* of an *aboveground storage tank system* shall ensure that within 180 *days*:

(a) *petroleum products* are removed and vapours purged from the *storage tank*, *piping*, dispensing, and transfer equipment; and
(b) the *storage tank*, *piping*, dispensing, and transfer requirement are removed.

(2) If the *site* is contaminated with *petroleum product*, the *site* shall be remediated to the criteria defined by:

(a) CCME–EPC–CS34, "Interim Canadian Environmental Quality Criteria for Contaminated Sites"; or
(b) other cleanup criteria that have been adopted by the *authority having jurisdiction.*

Section 6.5 Disposal of Shop–fabricated Aboveground Storage Tanks

6.5.1 When a shop–fabricated *aboveground storage tank* is to be disposed of, it shall be purged of vapours and sufficient openings cut in the *storage tank* to render it unfit for future use.

Appendix A Authorities Having Jurisdiction

Listed below are the addresses, phone and FAX numbers of the federal, provincial, and territorial authorities that have jurisdiction over the regulation of *aboveground storage tank systems*.

Federal Contact

Oil, Gas and Energy Division
Environment Canada
13 Floor, Place Vincent Massey
Ottawa, Ontario
K1A 0H3

Phone: 819–997–1221
FAX: 819–953–8903

Provincial Authorities

British Columbia

B.C. Ministry of Environment
Technical Services
Suite 1106
1175 Douglas Street
Victoria, British Columbia
V8V 1X4

Phone: 604–387–9952
FAX: 604–953–3856

Office of the Fire Commissioner
Ministry of Municipal Affairs,
Recreation and Culture
3rd Floor, 800 Johnson Street
Victoria, British Columbia
V8V 1X4

Phone: 604–356–9000
FAX:604–356–9019

Alberta

Alberta MUST Project
Room 1443
Standard Life Centre
10405 Jasper Ave.
Edmonton, Alberta
T5J 3N4

Phone: 403–427–3943
FAX: 403–427–0413

Alberta Environment
5th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, Alberta
T5K 2J6

Phone: 403–427–6182
FAX:403–422–5120

Technical Services
Building and Fire Safety
Alberta Labour
701, 10808 – 99 Avenue

Phone: 403–427–8265
FAX: 403–422–3562

Edmonton, Alberta
T5K 0G5

Saskatchewan

Chemical Management Section — Phone: 306–787–6185
Air and Land Protection Branch — FAX: 306–787–0197
Saskatchewan Environment and Public Safety
3085 Albert Street
Regina, Saskatchewan
S4S 0B1

Department of Community Services — Phone: 306–787–4516
Fire Commissioner's Office — FAX: 306–787–9273
1870 Albert Street
Regina, Saskatchewan
S4P 3V7

Manitoba

Operations, Winnipeg Region — Phone: 204–945–7110
Department of Environment — FAX: 204–945–5229
Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0N6

Ontario

Fuels Safety Branch — Phone: 416–234–6030
Ministry of Consumer and Commercial Relations — FAX: 416–234–6043
Mutual Group, West Tower
3300 Bloor Street West, 4th Floor
Etobicoke, Ontario
M8X 2X4

Ministry of Environment and Energy — Phone: 705–675–4501
North Eastern Region — FAX: 705–675–4180
Sudbury Regional Office
199 Larch Street, 11th Floor
Sudbury, Ontario
P3E 5P9

Ontario Fire Marshall's Office — Phone: 416–965–4852
Ministry of the Solicitor General — FAX: 416–965–7620
7 Overlea Boulevard, 3rd Floor
Toronto, Ontario
M4H 1A8

Quebec

Petroleum Products Branch
Department of Natural Resources
5700–4th Avenue West
Room B405
Charlesbourg, Quebec
G1H 6R1
Phone: 418–643–3327
FAX: 418–528–0690

New Brunswick

Industrial Programs Section
Department of the Environment
P.O. Box 6000
364 Argyle Street
Fredericton, New Brunswick
E3B 5H1
Phone: 506–457–4848
FAX: 506–453–2265

Nova Scotia

Petroleum Storage Tank Systems
Department of the Environment
P.O. Box 2107
5151 Terminal Road
Halifax, Nova Scotia
B3J 3B7
Phone: 902–424–5300
FAX: 902–424–0503

Newfoundland and Labrador

Industrial Environmental Engineering Division
Department of Environment and Lands
P.O. Box 8700
St. John's, Newfoundland
A1B 4J6
Phone: 709–729–2561
FAX: 709–729–1930

Prince Edward Island

Director, Environmental Protection Branch
Department of the Environment
P.O. Box 2000
Charlottetown, Prince Edward Island
C1A 7N8
Phone: 902–368–5057
FAX: 902–368–5830

Territorial Authorities

Yukon

Public Safety Branch
Department of Community and Transportation Service
Box 2703, 2nd Avenue
Whitehorse, Yukon
Y1A 2C6
Phone: 403–667–5824
FAX: 403–667–7209

Northwest Territories

Office of the Fire Marshal
Department of Safety and Public Services
Government of Northwest Territories
Main Floor, Northway Building
Box 1302, 49th Avenue
Yellowknife, Northwest Territories
X1A 2L9

Phone: 403–873–7472
FAX: 403–873–0117

Appendix B Explanatory Material

The explanatory notes in this Appendix are intended to clarify the requirements of this Code or to provide additional relevant information. The **bold–face** reference numbers that introduce each item correspond to the applicable Article or Sentence in this Code.

B.1.5.2 *Interstitial space* includes the following space:

(a) outside the *storage tank* bottom and above a synthetic membrane liner or prepared soil layer;
(b) between the *storage tank* bottom and a secondary bottom creating a *leak*– containment space;
(c) between two pipes of a double–wall *piping* system; or
(d) between a pipe and a synthetic membrane liner.

B.1.5.2 The definition of *used oil* was taken from the 1989 CCME publication "Code of Practice for Used Oil Management in Canada" with the following modifications.

(a) The category of "metal–working fluids" has been removed as this product class is considered to be sufficiently different from the definition of *petroleum products.* Since metal–working fluids may include a substantial amount of water, further consideration would have to be given to the need to line steel tanks.
(b) The category of "insulating fluids or coolant" has been modified for similar reasons, and now reads as "insulating oils".

Used oil contains primarily hydrocarbons; however, it may also contain additives (e.g., a total of 14% by volume of detergents and viscosity–improvers in lube oils for gasoline engines). It contains physical and chemical impurities (e.g., solids, metals, and chlorinated organics) due to physical contamination and chemical reactions occurring during its use. Contamination of *used oil* may also occur from mixing with other oily fluids or fluid wastes when it is collected for recycling.

This Code does not treat *used oil* exclusively as a hazardous waste. *Used oil* may or may not be designated as a hazardous waste depending on the types and amounts of chemical impurities it contains. For example, *used oil* containing 50 ppm or more of PCBs is designated as a hazardous waste in most Canadian jurisdictions. If the *used oil* is designated as a hazardous waste, other requirements for its storage may apply. Consult the *authority having jurisdiction*.

B.2.2.1 All *storage tanks* that would ultimately be required to have *secondary containment* should be registered.

The wording "single or total capacity" is provided to prevent *owners* from using several small *storage tanks* to avoid either registration or *secondary containment* requirements. If two or more *storage tanks* having a combined capacity of greater than 4 000 L are manifolded together or are connected to the same appliance (eg. a furnace or a power generator), then all the tanks, regardless of capacity, must be registered and have *secondary containment*. However, if the *storage tanks* are completely independent systems and each tank has a capacity of less than or equal to 4 000 L, then registration and *secondary containment* are not required.

B.2.2.2 The registration form prescribed by the *authority having jurisdiction* will require, as a minimum, the information outlined in Appendix C. However, the *authority having jurisdiction* may require additional information about a *storage tank system, owner*, or *operator* as the authority sees fit.

B.2.2.3 *Storage tanks* shall be identified in a manner that will enable an inspector to match a *storage tank* in the field with the information provided on the registration form. It is recommended that both the application for approval to construct a *storage tank system* and the registration forms should include the emergency telephone numbers for a *leak* or *spill*.

B.3.2.5. The CCME "Guideline for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks" applies to storage tanks having a capacity of no more than 4 000 L, designed to contain a *petroleum product* that has a vapour pressure of 10 kPa or greater. The published document should be available from CCME in late 1994.

B.3.3.4 The concept of *interstitial space* monitoring is most often used with underground *storage tank systems*. Often the *interstitial space* is between the two walls of a double–wall *storage tank* or the space between a single–wall *storage tank* and an impermeable membrane liner. The definition of *interstitial space* in this Code is broad and is intended to include **any space** below the ground level that is within a diked area above the *impermeable barrier* of a *secondary containment* system, such as a synthetic membrane liner (or other *impermeable barrier*). Consequently, a sump that is properly designed and located within the diked area can be used to provide *interstitial space* monitoring.

B.3.3.5(1)(b) The overfill alarm system required shall be in addition to the alarm or gauging system that is routinely used. This system shall be used as a back–up system when the primary means of detecting a high level has failed.

B.3.3.7 The *tank bottom water* from the bottom of a *storage tank* normally contains water, insoluble oil or product, and dissolved hydrocarbons. The concentration of dissolved or soluble hydrocarbons is often sufficiently high that the *tank bottom water* would be considered toxic if a biological toxicity test were

conducted. Since *oil–water separators*, such as an API separator, only separate insoluble oil from water, the *tank bottom water* should be segregated in a holding tank and sent to a wastewater treatment facility either on–*site* or off–*site* (and not directly to an *oil–water separator*).

B.3.4.3(2) The option provided in Sentence 3.4.3(2) is not permitted where an *overfill protection device* in conformance with ULC/ORD–C58.15, "Overfill Protection Devices for Flammable Liquid Storage Tanks", is required. These *overfill protection devices* are required with concrete encased tank assemblies, contained steel tank assemblies, protected aboveground tank assemblies, and double wall horizontal tanks (ULC S601) that are not within a dike.

B.3.5.2(1) Differential settlement between a *storage tank* assembly and the connected *piping* is a potential concern. Installers shall ensure that tank assemblies are located on a solid foundation in conformance with the manufacturer's instructions.

B.3.6.1 Since a *secondary containment system* is required for most new *aboveground storage tank systems*, the consensus of the CCME National Task Force was that *cathodic protection* should not be mandatory. However, the use of certain *secondary containment* techniques may preclude the use of *cathodic protection* and in some cases cause accelerated corrosion of the *storage tank* bottom. For example, with a synthetic membrane liner, the option of *cathodic protection* becomes severely limited. Synthetic liners are usually non–conductive and act as a barrier to electrical current. If the anodes were on the underside of the liner, the *cathodic protection* system would be ineffective. When a synthetic membrane liner is used, special precautions and steps must be taken to ensure electrical continuity and proper operation of the *cathodic protection* system. A *corrosion expert* should be consulted.

B.3.7 An important issue with the use of *impermeable barriers* is that they trap precipitation as well as *spills*, overfills and *leaks*. If the *storage tank* pad or foundation is not sufficiently elevated and well drained, increased moisture on the underside of the *storage tank* bottom may cause accelerated corrosion.

There are advantages and disadvantages of certain types of *impermeable barriers.* In areas of high precipitation, the tank foundation design, the *secondary containment* system and *cathodic protection* options should be carefully evaluated.

B.3.7.3(1)(c)(i) If a clay (or bentonite) barrier drys out, it will crack and *leak*. Consequently, clay barriers must be kept wet. Design engineers should not permit the installation of clay barriers in arid or semi–arid parts of the country where desiccation of the clay is likely. An engineer should also supervise the installation to ensure that the material is homogenous and uniformly applied according to the engineer's specifications.

B.3.7.1(1)(d) ULC is developing a new standard (ULC S655) that may ultimately replace ULC/ORD C142.5 and ULC/ORD–C142.16.

B.3.7.5(1) The installer should advise the electrical contractor that synthetic membrane liners have been used and ensure that the liner is not punctured by grounding rods. It is recommended that grounding rods not be inserted within the diked areas where a synthetic membrane or clay liner has been used for *secondary containment*. If penetrations are required, locating the penetrations at a high point reduces the likelihood of *leaks*.

B.3.8.1 It is important to note that the requirements of the fire authorities must be met if any *used oil* collection tank is considered for use indoors.

B.3.9.6 If the connection point is located slightly above the horizontal product delivery/supply pipe, *spillage* can be minimized when lines are being disconnected during the product transfer process.

B.3.9.7 Mechanical joints, such as flanged joints or couplers, are not to be used below ground. Additionally, it is good practice to minimize the use of threaded joints below ground if possible.

B.3.10 The following explanation should clarify the *leak detection* terminology and monitoring requirements in this Code.

***Aboveground storage tanks*—monitoring the interstitial space:** Most aboveground *storage tanks* are located within a *secondary containment* system (usually a dike). This keeps *leaked* or *spilled petroleum product* from escaping into the environment. When this Code refers to aboveground *storage tanks* within *secondary containment*, "monitoring of the *interstitial space*" rather than "*leak detection*" is the process of detecting product that is between the primary *storage tank* and the *secondary containment*.

Monitoring of the *interstitial space* is typically conducted periodically (at least once a month). A sump located within the dike or contained area is checked for *petroleum product* with a baler or sampler if the sump is deep, or by visual observation if the sump is shallow.

Aboveground tank *leak detection*: In field–erected *storage tanks* and vertical shop–fabricated *storage tanks* (ULC S630 tanks), the floor rests on the ground. Regardless of whether an *impermeable barrier* lies beneath the floor of the tank, the term "*leak detection*" is used to describe a system of *pipes* (usually perforated) located under the floor of the *storage tank*. These perforated *pipes* transmit any *leakage* to the tank perimeter where the product can be observed or detected. API Standard 650 Appendix I provides a number of excellent details and specifications for this type of *leak detection*.

Aboveground *piping*: Since *leaks* from aboveground *piping* can be easily observed, *leak detection* is not required.

Underground *piping*: *Leak detection* terms are complicated for underground *piping*. To be consistent with the CCME–EPC–61E "Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products" and to specify the required performance level or type of *leak detection*, the terms *level 1, level 2, level 3 or level 4* are attached to the term *leak detection.* A precision *leak* test is also discussed. The reader should also refer to the *leak detection* definitions in Article 1.5.2.

***Level 1 leak detection*:** is *leak detection* capable of detecting *leaks* of less than 0.38 L/h with a probability of detection of 0.95 and a probability of false alarm of 0.05. Pressure testing of *piping* will often meet *level 1* performance. An alternate method of *level 1 leak detection*
is to add tracer compounds periodically to the *petroleum product* and then sense for the tracer.

A precision *leak* test: is *level 1 leak detection* conducted within 24 hours. Two examples of a precision *leak* test are *piping* pressure tests, and the addition of tracer compounds followed by tracer detection. Although statistical inventory analysis might qualify as *level 1 leak detection,* it would not qualify as a precision *leak* test because the data is typically acquired over a period of 30 *days*.

***Level 2 leak detection*:** If the pipe is larger than 75 mm in diameter, *secondary containment* is not required (although it is recommended).

In some cases a *line–leak detector* may work. However, in large–diameter *pipe* and/or with long *pipe* runs (for example, an airport hydrant system), *line–leak detectors* are not suitable. In these situations, *level 2 leak detection* is required.

There are several types of *level 2 leak detection*. Some are only suitable for underground *storage tank systems* with underground *piping* and an accurate product flow meter or dispenser (typically retail service stations).

Statistical inventory reconciliation is a *level 1 or level 2 leak detection* method that is suitable for underground *storage tanks and piping*, but it is not suitable for use with underground *piping* connected to an *aboveground storage tank*.

Groundwater monitoring or vapour monitoring are types of *level 2 leak detection* that may be suitable for larger diameter *piping*. Product vapour pressure and subsurface conditions (soil type, depth to groundwater) are significant factors in determining whether one of these types of *leak detection* is suitable for a particular *site*.

Leak detection methods that provide *level 1* performance would of course be considered satisfactory *level 2 leak detection*.

***Level 3 leak detection*:** is provided by *line–leak detectors* that are located on the primary *pipe*. Product passes through the *line–leak detector*. These devices sense a change in *petroleum product* pressure when a submersible pump starts up. *Line–leak detectors* are normally used at retail service stations and cardlocks that have submersible pumps and constantly pressurized *piping*. These devices are capable of quickly detecting large *leaks* (approximately 12 L/h). Some *line–leak detectors* are also capable of detecting small *leaks* as in *level 1 or level 2 leak detection*. *Line– leak detectors* are not available for *pipe* greater than 100 mm in diameter.

Level 4 leak detection: Underground *piping* of 75 mm in diameter or less must have *secondary containment*, typically in the form of double–wall *piping*. With double–wall *piping*, the secondary or outer pipe typically drains to a sump where a *level 4 leak detection* device (a product or water sensor) detects the *petroleum product* or water. Probes may also be located in the *interstial space* between the primary and secondary *piping.*

B.3.10.7(2) When the *leak–detection* device is not an electrical device (such as a monitoring well or statistical inventory reconciliation), electrical interlocks may not be possible.

B.3.10.8 Even with the present mechanical type of *line–leak detectors*, a line *leak* within a submersible pump system can result in large volumes of product being pumped into the ground. *Leaks* from submersible pump systems have been the cause of some of the largest environmental and safety incidents. Where *line–leak detectors* are used, they shall not be bypassed when problems are encountered when dispensing the product.

B.3.12.2 Centrifugal pumps would tend to emulsify an oil/water mixture and make the mixture extremely difficult to separate.

B.3.13.4 The soil should consist of gravels, coarse or medium sands, coarse silts, or other permeable material.

B.3.13.7(1) A filter pack is a porous medium usually consisting of sand or pea gravel.

B.3.13.10 Monitoring wells shall **not** be constructed of Schedule 20 PVC "sewer" or leach field *piping*.

B.4.2 This Section of the Code requires that *existing aboveground storage tank systems* be upgraded to the standards of Part 3 of this Code within 10 to 15 years, depending on whether the tank is shop–fabricated or field–erected. Since Part 3 of this Code requires that *storage tanks* be designed and installed in conformance with Part 4 of the NFC, the provisions in this Section could be interpreted to mean that all *existing* field–erected *aboveground storage tanks* must meet the requirements of Part 4 of the NFC (currently 1990 edition) by

2009, 15 years from the date of publication of this Code. However, this is not the intended interpretation. It is beyond the mandate of the CCME National Task Force on Storage Tanks to make requirements that are concerned with fire safety and are within the mandate of provincial or local fire marshals. *Storage tank owners* should consult the appropriate federal, provincial or territorial *authority having jurisdiction* to determine what upgrading, if any, might be required.

B.4.3.2 Option 4.3.2(1)(a)(iii) allows field–erected *storage tanks* to simply follow the requirements of API Standard 653. Strict adherence to API Standard 653 is required. API Standard 653 requires periodic corrosion monitoring. Once a corrosion rate is established, subsequent corrosion monitoring and repairs to the tank bottom can be performed prior the occurrence of any perforations. If perforations do occur, it can be assumed that the provisions of API Standard 653 have not been strictly followed. If this occurs, stronger preventive steps are specified.

B.5.2.2(2) To facilitate early detection of *leakage* from an *aboveground storage tank system*, proper inventory records must be developed, maintained, and reviewed continuously for any developing trends that may signify a loss of product. The traditional way of doing this has been to convert a liquid level to a liquid volume (i.e., gallons/litres of product) currently in the *storage tank*. A device (generally a recording type of pump) that will measure the amount of product withdrawn from the *storage tank* is also an integral part of the inventory control system. Finally, the amount of product in storage must be reconciled with the amount recorded weekly as having been withdrawn. Any continuous discrepancy (shortage) must be investigated as a possible *leak* from the *aboveground storage tank system*.

B.5.3.1(2)(b) Frequent visual inspections of *aboveground storage tank systems* are required to provide early detection of equipment failures and product *spills*. The *authority having jurisdiction* may decide that *operators* of small tanks (5 000 L and less) do not have to do daily checks. In addition, it may not be possible or practical to inspect *storage tanks* at unattended remote *sites*.

B.5.4.1(2) A significant number of the *spills* that occur at *aboveground storage tank* facilities result from improper procedures during routine activities. These accidents can be reduced or eliminated if operating personnel are properly trained about correct safety procedures and the importance of following them to prevent injury and environmental incidents. Training must be periodically followed up to ensure that proper procedures are being followed.

B.5.5.2(1) A surface potential of at least –850 mV is required on all parts of the floor for adequate *cathodic protection*. However, due to ground resistance on large–diameter *storage tanks,* for the centre of the tank to reach –850 mV, the potential at the outer edge may have to be somewhat higher—for example, –1050mV. Consequently, a *corrosion expert* should determine what the surface potential should be at the perimeter of the *storage tank.*

B.5.6 CPPI is developing an Environmental Code of Practice that addresses the management of *spills* and stormwater from petroleum storage and distribution facilities. This document would be useful for anyone who owns or operates an *oil/water separator.* The document should be available from CPPI in the fall of 1994.

In addition, ULC is in the process of developing a standard for shop–fabricated *oil/water separators.* This document should be available in 1995. It is expected that provincial and territorial regulatory authorities will require shop–fabricated *oil/water separators* to be designed, built and installed in conformance with this standard.

Oil/water separators do not remove the soluble fraction of oil that is in the water or storm runoff. Therefore, it should be noted that even if an *oil/water separator* produces an effluent that has an oil and grease or hydrocarbon content that is below provincial or territorial discharge limits, the effluent may still be acutely toxic to fish.

It is recommended that the *authority having jurisdiction* ensures that when an *oil–water separator* is to be installed, a proper design basis is used. The *storage tank owner* should control oil/water sources to the separator, and routinely remove *sludge* and the *oil layer* from the separator. Less attention should be paid to separator effluent *discharge* values which can vary substantially and are highly sensitive to flow rates and other factors at the time of effluent sampling.

B.5.6.4 Detergents and cleaning solutions cause oil to emulsify in water and prevent effective separation. Never wash trucks with such products in areas that drain to an *oil–water separator*.

B.6.3.1 An impressed current *cathodic protection* system provides protection against corrosion only when it is on and maintained. To avoid corrosion problems on tanks withdrawn from service, the impressed current system should be left on and maintained.

Appendix C Minimum Information Required for Registration of Aboveground Storage Tank Systems

C.1 The registration form prescribed by the *authority having jurisdiction* shall require, as
a minimum, the following information:

(a) name of *owner*;
(b) address of *owner*;
(c) name of *operator* (if different than *storage tank owner*);
(d) name of landowner (if different than *storage tank owner*);
(e) type of facility;
(f) location of *storage tanks* (if different than address of *owner*);
(g) type of *storage tank* (horizontal or vertical);
(h) capacity of *storage tank*;
(i) type of product stored;
(j) year of installation;
(k) type of *storage tank* material;
(l) type of *piping* material;
(m) corrosion protection provided (if applicable);
(n) type of pump;
(o) type of diking (material);
(p) type of *secondary containment* material;
(q) *internal linings*;
(r) *leak–detection* equipment;
(s) number and location of monitoring wells;
(t) type of overfill protection;
(u) type of VOC emission control; and
(v) plan indicating the location of each *storage tank system* in relation to buildings, water, and other distinctive features.

Appendix D Spill Reporting Telephone Numbers

The *owner* or *operator* of an *aboveground storage tank system* who discovers, suspects, or is notified by any person of possible *leakage* shall immediately notify the *authority having jurisdiction* by telephone and provide the information requested by the *authority having jurisdiction*.

The following are the emergency phone numbers of the federal and provincial authorities. Either of the two numbers listed can be called.

Province/Territory	**Federal Authority**	**Provincial/Territorial Authority**
Newfoundland	**709–772–2083**	**709–772–2083**
Prince Edward Island	**1–800–565–1633** Coast Guard (in Maritimes only)	**1–800–565–1633** Coast Guard (in Maritimes only)
Nova Scotia	**1–800–565–1633** Coast Guard (in Maritimes only)	**1–800–565–1633** Coast Guard (in Maritimes only)
New Brunswick	**1–800–565–1633** Coast Guard (in Maritimes only)	**1–800–565–1633** Coast Guard (in Maritimes only)
Quebec	**514–283–2333** Environment Canada Dept. of Emergency Answering Service	**514–873–3454** Environment Environmental Emergency
Ontario	**613–239–6065**	**1–800–268–6060**

Environment and Energy

Reporting Centre

Manitoba
944–4888

Environment

Environmental Emergency Line

Saskatchewan
667–7525

Centre

Environment and Public Safety

Alberta
222–6514

Environment

Control (in Alberta only)

Northwest Territories

Line

British Columbia
666–6011

Program

Yukon
667–7244

Environmental Protection

Environment Canada Ministry of

Environmental Emergencies Spill

403–468–8020 204–

Environment Canada Manitoba

Environmental Emergencies

403–468–8020 1–800–

Environment Canada Spill Report

Environmental Emergencies

403–499–2432 1–800–

Environment Canada Alberta

Spill Reporting Pollution

403–468–8020 403–920–8130
Environment Canada Spill Report

Environmental Emergencies

604–666–6100 604–

Environment Canada Coast Guard
Environmental Emergencies
1–800–663–3456
Provincial Emergency

403–667–7244 403–

Environmental Protection

Services Services