



Environmental Guidelines

318-8

Management of Petroleum Storage Tanks

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ENVIRONMENTAL GUIDELINES (EG) – MANAGEMENT OF PETROLEUM STORAGE TANKS

PRIMARY GOALS

To avoid the contamination of the environment and negative ecological impacts by preventing leaks, discharges or spills of hydrocarbons (gasoline, diesel, heating oil, waste/used oil).

To ensure adequate containment (during refuelling, storage, and transfer) of the hydrocarbons in petroleum storage tanks owned by the Correctional Service of Canada (CSC).

To reduce the releases of volatile organic compounds (VOC) from petroleum storage tanks that contribute to the production of ground-level ozone (smog).

SPECIFIC OBJECTIVES

To demonstrate that CSC registers and manages petroleum storage tanks at its facilities in a way that complies with the applicable acts, federal regulations, guidelines, norms and codes.

To ensure that petroleum storage tanks under CSC's charge are operated, maintained and monitored in accordance with standardized preventive practices.

To reduce the financial and environmental risks (soil, groundwater and surface water contamination) related to the operation of petroleum storage tanks.

To keep monitoring an up-to-date official registry of the petroleum storage tanks owned by CSC.

AUTHORITIES

Correctional Service of Canada Commissioner's Directive 318 – Environmental Programs.

Canadian Environmental Protection Act, 1999.

Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands Regulations, 1997.

Technical Guidelines for Aboveground Storage Tank Systems Containing Petroleum Products, Environment Canada, 1996.



Technical Guidelines for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products, Environment Canada, 1995.

Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products, CCME, August 1994.

Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products, CCME, March 1993.

Fisheries Act, R.S.C. 1985, c. F-14.

National Fire Code of Canada (NFC) 1995, Part 4.

CAN/CSA-B139-M91 *Installation Code for Oil Burning Equipment.*

SECTION 1 – DEFINITIONS, RESPONSIBILITIES AND SCOPE

DEFINITIONS

The following definitions apply to these Environmental Guidelines. For additional definitions, refer to the above-mentioned Regulations and Codes of Practice.

Cathodic protection – A method of preventing or reducing corrosion of a metal surface by making the metal a cathode, using an impressed direct current or attaching sacrificial anodes.

Dispenser sump (dikes) – A container, located underneath or near a dispenser or self-contained suction pump, that collects or contains leaks (raised part of dike floor).

Internal lining – A coating of a non-corrodible material bonded firmly to the interior surface of the tank and resistant to the petroleum products or allied petroleum products stored.

Leak detection – A device or a method that is capable of detecting leaks in storage tanks and piping with a probability of detection of 0.95 and a probability of false alarm of 0.05.

- a. Level 1 detection: Device or method that is capable of detecting a leak of 0.38L/h.
- b. Level 2 detection: Device or method that is capable of detecting a leak of 0.76L/h.
- c. Level 3 detection: Device or method used in pressure piping that operates whenever the submersible pump starts up, and that is capable of detecting a leak of 12L/h.
- d. Level 4 detection: Device or method that is capable of detecting a leak:
 - i. before the monitoring sump or interstitial space fills up to 50% of its capacity by volume; or
 - ii. before 600 litres has leaked, whichever comes first.

Motive fuels – Any fuel that powers a vehicle (gasoline, diesel, ethanol, etc.).

Overfill-protection device – An electrical or mechanical device that is installed in an underground storage tank, fill tube, or vent and helps prevent a storage tank from being overfilled.

Petroleum product – 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, it includes such products as gasoline, diesel fuel, aviation fuel, kerosene, naphtha, lubricating oil, fuel oil, and engine oil (new or used), and excludes propane, paints and solvents.



Registered tank – Any underground storage tank for petroleum or allied products that have a capacity of more than 230 litres, as well as any outside aboveground storage tank system for petroleum products having a single or total capacity of more than 2,500 litres.

Secondary containment – Containment that prevents leaks from the primary storage tank system from reaching outside the containment area. It includes double wall underground storage tanks and piping, and liners.

Spill containment device – A container fitted to the inlet of a storage tank or to the suction coupling of a used oil storage tank that helps prevent spills from entering the environment.

VOC recovery system (phase I) – Equipment used to recover motive fuel vapours that escape between the fuel delivery trucks and the storage tanks.

VOC recovery system (phase II) – Equipment used to recover motive fuel vapours that escape when refuelling motor vehicles.

Volatile organic compounds (VOC) – Gases that contribute to the production of ground-level ozone.

RESPONSIBILITIES

The Institutional Head, his or her Assistants and the Corcan Operations Managers are accountable to ensure compliance with these Environmental Guidelines.

The Chief, Plant Maintenance (CPM) will normally be the person responsible for managing and monitoring the implementation of these Environmental Guidelines.

SCOPE

All CSC facilities that manage petroleum storage tanks are subject to these Environmental Guidelines.

SECTION 2 – GENERAL REQUIREMENTS

1. An institutional inventory of all on-site storage tanks containing petroleum products will be kept up to date at all times and placed in the appropriate file of the institution's Environmental Management System (EMS).
2. Copies of documents that are essential to the management of the institution's petroleum storage tanks (e.g. registrations, reports of leaks/spills, etc.) must be sent to the CSC's Regional Environmental Officer (REO) for information and future use.



SECTION 3 – SPECIFIC REQUIREMENTS

STORAGE TANK REGISTRATION

1. All underground storage tanks for petroleum products with a capacity of more than 230 litres, as well as aboveground storage tanks with a capacity of more than 2,500 litres are regulated and therefore must be registered with CSC National Headquarters (NHQ), which serves as the "**appropriate federal department**" (AFD). To this effect, an official CSC form [refer to Annex A] must be completed, signed, and dated for each registered tank.
2. The custodian of a petroleum storage tank must register it within 60 days after the installation is completed, or within 60 days of the tank being filled for the first time, whichever comes first. For compliance purposes, NHQ must be advised of all changes that pertain to the information requested in the registration form, and be notified within 60 days of a tank replacement, modification, or withdrawal from service.

DESIGN AND INSTALLATION

3. All work carried out on storage tank systems containing petroleum products (installation, tests, upgrades, dismantling) must be carried out by contractors who are qualified and accredited for petroleum equipment installation.
4. The design, operation, and maintenance of tanks must meet the following Technical Guidelines and Codes of Practice:
 - a. Technical Guidelines for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products, Environment Canada, 1995;
 - b. Technical Guidelines for Aboveground Storage Tank Systems Containing Petroleum Products, Environment Canada, 1996;
 - c. *Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products*, CCME, March 1993;
 - d. *Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products*, CCME, August 1994.

Note: The principle requirements for the design and installation of petroleum storage tanks are summarized in Annexes B and C.

5. All new under and aboveground motive fuel storage tanks as well as all existing under and aboveground motive fuel storage tanks with a capacity of 2,500 litres or more located in the Lower Fraser Valley, the Windsor-Quebec City corridor and the Saint John N.B. region, should have (where available) a phase I and phase II volatile organic compound recovery system.



MAINTENANCE PLAN – EQUIPMENT INSPECTION AND INVENTORY CONTROL

6. Within institutions, every tank covered under the Regulations will be assigned a custodian, i.e. the person who operates the tank.
7. The tank custodian must prepare a formal operation, maintenance, inspection, and testing plan for each tank. The CPM can provide the necessary planning services.
8. A leak detection system must be installed and maintained on all regulated tanks.
9. A card/key lock pumping station must have signs posted that provide details of operating and spill procedures and emergency telephone numbers.
10. The planned frequency and protocol for most pressure, vacuum and other tests on tanks can be based on manufacturers and installers instructions, except that once every two years a professional engineer should be retained to inspect and recertify the integrity of protection systems (e.g. cathodic) of every tank with underground components.
11. It is suggested that the Maintenance Management System (MMS) operated by the Chief of Plant Maintenance (CPM) be used to schedule tests of all tanks and record test results.
12. Any leaks and any abnormal or unexplained variances that result from the inventory reconciliation must be acted upon immediately and reported to CSC's Regional Environmental Officer (REO).
13. For underground tanks, and for aboveground tanks that are connected to underground fuel distribution pipes, the institutional custodian must:
 - a. once weekly take a dipstick measurement of the quantity of water and fuel, respectively, in the tank (this requires special pastes for the dipstick);
 - b. once weekly, simultaneously with the dipstick measurement, take a reading of the amount of fuel pumped from the tank;
 - c. once weekly calculate the amount of fuel that should be in the tank based on a perpetual inventory of fluid transfers in and out (compare the dipstick measurement result with the calculated inventory and average the discrepancy between calculated and measured inventory during the last four weeks); and
 - Note:** The custodian must immediately investigate suspected leakage if:
 - i. the water level at any time exceeds 5 cm (2 inches);
 - ii. the 4-week moving average difference between calculated and measured fuel levels exceeds 0.5% of tank capacity.
 - d. once monthly inspect monitoring wells and take action if leaked fuel is detected. The CPM can normally provide this service.



14. For aboveground tanks, the institutional custodian conducts a weekly visual inspection and records this as having been done in the appropriate EMS registry.

Note: If combined with an acceptable statistical inventory reconciliation, inventory control of underground motive fuel storage tanks with a capacity of less than 5000 litres is an acceptable form of leak detection (level 2). Inventory control of underground motive fuel storage tanks with a capacity of greater than 5000 litres is an acceptable form of inventory monitoring, but is not an acceptable form of leak detection.

SECTION 4 – DATA MANAGEMENT AND REPORTING

RECORDS

1. Upon request from regional or central authorities, the CPM will submit the following information:
 - a. up-to-date registration information of the petroleum storage tanks;
 - b. where applicable, the inventory control data (records) for the requested period; and
 - c. where applicable, the petroleum product leak or spill reports.
2. The documents required by these Environmental Guidelines (registrations, maintenance files, upgrade project briefs, inspection reports, inventory control registry, leak and spill incident reports) need to be kept on site at least five years after the petroleum storage tank has been removed or its operational life has expired.
3. Inventory control and reconciliation records must be kept on site in an acceptable manner and format, and maintained for a period of at least two years for examination by the authority having jurisdiction.

REPORTING

4. Any episode involving a major petroleum product leak or spill (that is to say one that had or could have significant environmental impact or that requires the intervention of external expertise and equipment to confine and recover the contaminants) must be written up in an environmental incident report within 24 hours of the event. This report must be given to CSC's Regional Environmental Officer (REO). Where applicable, depending on the nature and severity of the incident, the appropriate CSC authorities will provide a written report to Environment Canada. In cases of major spill, institutional authorities must advise directly by telephone Environment Canada (Environmental Emergencies Division) in their region.

Note: The contact numbers for Environment Canada – Regional Environmental Emergency Divisions are indicated in Annex D of CSC's Environmental Guidelines on Environmental Emergency Plan.



SECTION 5 – REFERENCES

1. For more information on managing petroleum storage tanks, please see the Technical Assistance Bulletins (TABs) developed by the Federal Programs Division of Environment Canada. They are available on the infonet at: www.on.ec.gc.ca/pollution/fpd/tabs/intro-e.html. The bulletins are an excellent source of information on managing, operating and maintaining petroleum storage tanks.
2. The federal government's tank registration and other requirements are summarized in the compliance promotion bulletins at: <http://www.on.ec.gc.ca/pollution/fpd/cpb/3017-e.html>.
3. Justice Canada infonet site on the *Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands or Aboriginal Lands Regulations* at: <http://laws.justice.gc.ca/en/C-15.31/SOR-97-10/text.html>.
4. Canadian Council of Ministers of the Environment (CCME) internet site at: <http://www.ccme.ca/ccme>.

Assistant Commissioner,
Corporate Services

Original signed by:

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ANNEX A

Petroleum Storage Tank Registration Form *

Correctional Service Canada / Service correctionnel Canada		TANK REGISTRATION <small>NOTE: Numbers 1 to 22 on this form, are in reference to the Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands or Aboriginal Lands/Régulation des réservoirs pétroliers et de produits associés sur le territoire fédéral et les terres autochtones</small> <small>YELLOW highlighted field = Commentaire field - can be read by placing your cursor over field. Champ surligné en JAUNE = Champ commentaires - il est possible de lire les commentaires en passant le curseur de la souris sur ces lignes.</small>		ENREGISTREMENT DES RÉSERVOIRS PÉTROLIERS <small>NOTE: Les numéros 1 à 22 figurant sur ce formulaire, font référence au Règlement fédéral sur l'enregistrement des systèmes de stockage de produits pétroliers et de produits associés sur le territoire fédéral et les terres autochtones</small>	
<input type="text"/> Tank number - Numéro du réservoir		<input type="text"/> Site Classification (NHQ USE ONLY - Classification de l'emplacement (À L'USAGE DE FAC SEULEMENT))			
GENERAL INFORMATION - INFORMATION GÉNÉRALE:					
1. Owner Name (Institution) - Nom du propriétaire (établissement) CSC - <input type="text"/>					Institution no. - N° de l'établissement <input type="text"/>
2. Address - Adresse City - Ville <input type="text"/> Province <input type="text"/> Postal code - Code postal <input type="text"/>					
3. Name of Operator - Nom de l'opérateur					Telephone number - Numéro de téléphone <input type="text"/>
4. Name of Landowner - Nom du propriétaire du terrain Correctional Service Canada					
TANK INFORMATION - INFORMATION SUR LE RÉSERVOIR					
5. Type of facility - Type d'installation Select from list here - Choisir de la liste ici		6. Location of storage tank (i.e. Building #45) - Emplacement du réservoir (ex. Bâtiment #45) <input type="text"/>			
7a. Type of tank - Type de réservoir Select from list here - Choisir de la liste ici		7b. Capacity of tank (combined capacity for tank systems) - Capacité du réservoir (capacité combinée pour les systèmes de stockage) Select from list here - Choisir de la liste ici			
8. Tank contents - Contenu du réservoir Select from list here - Choisir de la liste ici		9. Year installed - Année d'installation <input type="text"/>			
10a. Tank material - Matériau de fabrication du réservoir Select from list here - Choisir de la liste ici		10b. Tank construction - Construction du réservoir Select from list here - Choisir de la liste ici			
11a. Piping material - Matériau de fabrication de la tuyauterie Select from list here - Choisir de la liste ici		11b. Piping construction - Construction de la tuyauterie Select from list here - Choisir de la liste ici			
12a. Tank corrosion protection - Protection contre la corrosion (réservoir) Select from list here - Choisir de la liste ici		12b. Piping corrosion protection - Protection contre la corrosion (tuyauterie) Select from list here - Choisir de la liste ici			
13. Type of pump(s) - Type de pompe(s) Select from list here - Choisir de la liste ici		14a. Tank leak detection - Détection des fuites (réservoir) Select from list here - Choisir de la liste ici			
		14b. Piping leak detection - Détection des fuites (tuyauterie) Select from English list / Choisir de la liste française ici			
15. Internal tank(s) - Revêtement(s) intérieur(s) Select from list here - Choisir de la liste ici		16a. Tank secondary containment - Contènement secondaire (réservoir) Select from list here - Choisir de la liste ici			
17. Monitoring wells - Puits de surveillance Number / Nombre <input type="text"/>		19. VOC Emission Control (Volatile Organic Compound) - Réduction des émissions de COV (Composé Organique Volatile) Select from list here - Choisir de la liste ici			
18. Overfill protection - Protection contre les débordements Select from list here - Choisir de la liste ici		20. Tank manufacturer - Fabricant du réservoir <input type="text"/>			
21. Type of dike (ASTs only) - Type de digue (réservoirs hors sol seulement) Dike Floor - Pavé <input type="text"/> Dike Wall - Mur <input type="text"/>		22. Type of storage tank (ASTs only) - Orientation du réservoir (réservoirs hors sol seulement) Select from list here - Choisir de la liste ici			
COMMENTS - COMMENTAIRES <input type="text"/>					
FORM COMPLETED BY - FORMULAIRE COMPLETÉ PAR :					
Name - Nom <input type="text"/>		Title - Titre <input type="text"/>		Telephone number - Numéro de téléphone <input type="text"/>	
Signature <input type="text"/>		Date (YYYYMMDD-AAAAA) <input type="text"/>			
<small>CSC/CC 1265-02 (2002-11) (Word Version) Original = NHQ - Technical Services/Environnement Copy = Région - Services techniques/Environnement</small>					

* Note: This official CSC form is available on the infonet at: <http://infonet/forms/forms/1265-02.doc>.



ANNEX B

Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products: Principle Requirements of the Technical Guidelines

The following table summarizes the requirements set out in the Technical Guidelines for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.

Type of Petroleum Product Constituent	Motive Fuel Class A Sites *	Motive Fuel Class B Sites *	System Connected to Fuel Oil Burning Equipment	Used Oil	Allied Petroleum Products
Storage tanks (general construction)	ULC approved single or double wall steel or fibreglass reinforced plastic	ULC approved single or double wall steel or fibreglass reinforced plastic	ULC approved single or double wall steel or fibreglass reinforced plastic	ULC approved single or double wall steel or fibreglass reinforced plastic	ULC approved single or double wall steel or fibreglass reinforced plastic if compatible with the liquid to be stored ⁽¹⁾
Secondary containment	Required for tanks and piping	Required for piping through which the product runs ⁽²⁾	Required for tanks and piping	Required for tanks and fill tubes	Required for tanks and piping
Corrosion protection	Required for steel tanks and piping	Required for steel tanks and piping	Required for steel tanks and piping	Required for steel tanks and piping	Required for steel tanks and piping
Overfill protection device	Required	Required	Required (or vent alarm)	Not required	Required
Fill tube spill containment device	Required on fill pipe	Required on fill pipe	Required on fill pipe when the pipe is at ground level	Required for removal or transfer couplings	Required on fill pipe
Dispenser sump	Required	Required	Not required	Not applicable	Required
Leak detection system	<ul style="list-style-type: none"> Level 2 or 4 required for the suction tubes, the dispenser sump, and the interstitial space Level 4, 2 or 3 for pipes under pressure 	<ul style="list-style-type: none"> Level 2 or 4 required for the suction tubes, the dispenser sump, and the interstitial space Level 4, 2 or 3 for pipes under pressure 	<ul style="list-style-type: none"> Level 2 or 4 required in the interstitial space Manhole or access to the couplings between the piping and the tank Supply line and return piping must slope toward the tank 	<ul style="list-style-type: none"> Level 2 or 4 required for the interstitial space and remote fill pipes 	<ul style="list-style-type: none"> Level 2 or 4 required for the suction tubes, the dispenser sump, and the interstitial space Level 4, 2 or 3 for pipes under pressure

(1) The appropriate federal department may require additional equipment if justified.

(2) May not be required for the suction tubes in certain cases.

* For more information on the classification of CSC sites, consult Annex D.

Note: For more information, consult the *Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products*, CCME, March 1993.



ANNEX C

Aboveground Storage Tank Systems Containing Petroleum Products: Principle Requirements of the Technical Guidelines

The following table summarizes the requirements set out in the Technical Guidelines for Aboveground Storage Tank Systems Containing Petroleum Products.

Type of Tank Component	Prefabricated Storage Systems	Storage Tanks Built on Site
Storage tank (general characteristics)	ULC approved single or double wall steel	Double or single wall steel that meets API 650 standard
Secondary containment		
For the tank	Required for storage system above 4,000 L of capacity	Required
For the piping	Required for underground piping unless its diameter is greater than 75 mm (piping with a diameter greater than 75 mm must undergo precision testing every two years as of their 5 th year of use)	Required for underground piping unless its diameter is greater than 75 mm (piping with a diameter greater than 75 mm must undergo precision testing every two years as of their 5 th year of use)
Corrosion protection	Must be coated with rust-resistant material	Must be coated with rust-resistant material
Overfill protection device	Required	Required
Spill containment device	Required on the fill pipe and the dispenser sump	Required on the fill pipe and the dispenser sump
Dispenser sump	Required for dispensers of motive fuel	Required for dispensers of motive fuel
Leak detection system	<ul style="list-style-type: none"> • Interstitial space within the secondary containment must be monitored • Leak detection within the interstitial space of the secondary containment, vapour and groundwater monitoring wells, or leak detection systems on the piping • Level 2 or 4 leak detection system for the motive fuel dispenser sump 	<ul style="list-style-type: none"> • Interstitial space within the secondary containment must be monitored • Leak detection within the interstitial space of the secondary containment, vapour and groundwater monitoring wells, or leak detection systems on the piping • Level 2 or 4 leak detection system for the motive fuel dispenser sump

Note: For more information, please consult the *Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products*, CCME, August 1994.



ANNEX D

Classification of CSC Sites with Underground* Motive Fuel Storage Tank Systems

Region	Institution	Institution Number	Site Classification
ATLANTIC	Springhill	210	A
	Dorchester	220	A
	Westmorland	221	A
	Atlantic	231	A
	Nova	250	A
QUEBEC	MSF	312	A
	FTC	320	A
	Donnacona	321	B
	Joliette	325	A
	Leclerc	330	A
	Archambault	341	A
	SADP	342	A
	RRC	343	A
	Drummond	345	B
	Cowansville	350	A
	La Macaza	352	A
Port-Cartier	368	A	
ONTARIO	Kingston	416	A
	Millhaven	421	A
	Fenbrook	422	A
	Bath	423	A
	Collins Bay	440	A
	Frontenac	441	A
	Beaver Creek	443	A
	Joyceville	450	A
	Pittsburgh	451	A
	Grand Valley	465	A
	Warkworth	466	A
PRAIRIES	RPC	504	B
	Stony Mountain	510	A
	Rockwood	511	A
	Saskatchewan	520	B
	Riverbend	521	B
	Maple Creek	523	B
	Drumheller	530	B
	Grande Cache	532	B
	Pê Sâkâstêw	535	B
	Bowden	537	B
	Edmonton FSW	538	A
Edmonton (Max.)	539	B	
PACIFIC	William Head	820	A
	Matsqui	831	A
	RHC	832	A
	Mountain	833	A
	Sumas	835	A
	Kent	836	A
	Elbow Lake	847	A
	Ferndale	848	A
Mission	849	A	

* **Note:** Class A sites are considered more sensitive than class B sites due to the potential impacts of underground motive fuel storage tanks on the environment, on health or safety.