DRAFT OPERATOR'S MANUAL
UNDERGROUND FUEL STORAGE
TANK MANAGEMENT AT
FEDERAL FACILITIES IN ONTARIO

PREPARED FOR
ENVIRONMENT CANADA

PREPARED BY:
BARENCO INC.
IN COOPERATION WITH
JAGGER HIMS LIMITED

NOVEMBER, 1990

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COPY NO.

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CSA	-	CANADIAN STANDARDS ASSOCIATION
ECP	-	CANADA ENVIRONMENTAL CODE OF PRACTICE FOR UNDERGROUND STORAGE TANK SYSTEMS CONTAINING PETROLEUM PRODUCTS
FOC	-	ONTARIO ENERGY ACT AND FUEL OIL CODE
FRP	-	FIBERGLASS - REINFORCED PLASTIC
FSB	-	FUELS SAFETY BRANCH, ONTARIO MINISTRY OF CONSUMER AND COMMERCIAL RELATIONS
GHC	-	ONTARIO GASOLINE HANDLING ACT AND CODE
MOE	-	ONTARIO MINISTRY OF THE ENVIRONMENT
ULC	-	UNDERWRITERS' LABORATORIES OF CANADA

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF MANUAL

The purpose of this document is to provide operators of underground fuel tank systems at Federal facilities in Ontario with a management manual. Accordingly, this manual outlines

- regulatory requirements and guidelines at the Federal and Provincial levels.
- step-by-step management procedures in planning and installing new facilities or operating or abandoning existing facilities, and
- sources of information about tank management and the selection of outside companies to do the work.

This document is not intended to be a technical reference manual, and the reader is referred to other sources of information for detailed descriptions of tank systems.

1.2 FEDERAL AND PROVINCIAL JURISDICTIONS

Guidelines for the management of underground fuel tank systems at Federal facilities are established by the

- Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products.

This Environmental Code of Practice (ECP) was issued in 1989 by a National Task Force and is administered by Environment Canada. The document complements the National Fire Code of Canada and part of CSA Standard B139, Installation Code for Oil Burning Equipment.

The ECP was developed to promote uniform performance standards for tank management across Canada. Many requirements of the Code refer to the "jurisdiction having authority". In Ontario, this phrase usually refers to the Fuels Safety Branch (FSB) of the Ontario Ministry of Consumer and Commercial Relations.

The FSB regulates the storage of petroleum products through the Gasoline Handling and Energy Acts. The MOE regulates environmental protection through the Environmental Protection and Ontario Water Resources Acts, among other legislation. Some aspects of underground tank management, such as cleanup of contaminated soils, are covered under both FSB and MOE jurisdiction.

Pertinent legislation, regulations, and guidelines under Federal and Ontario jurisdiction are listed in Appendix A and are described in more detail in the individual sections of the manual.

1.3 MANUAL ORGANIZATION

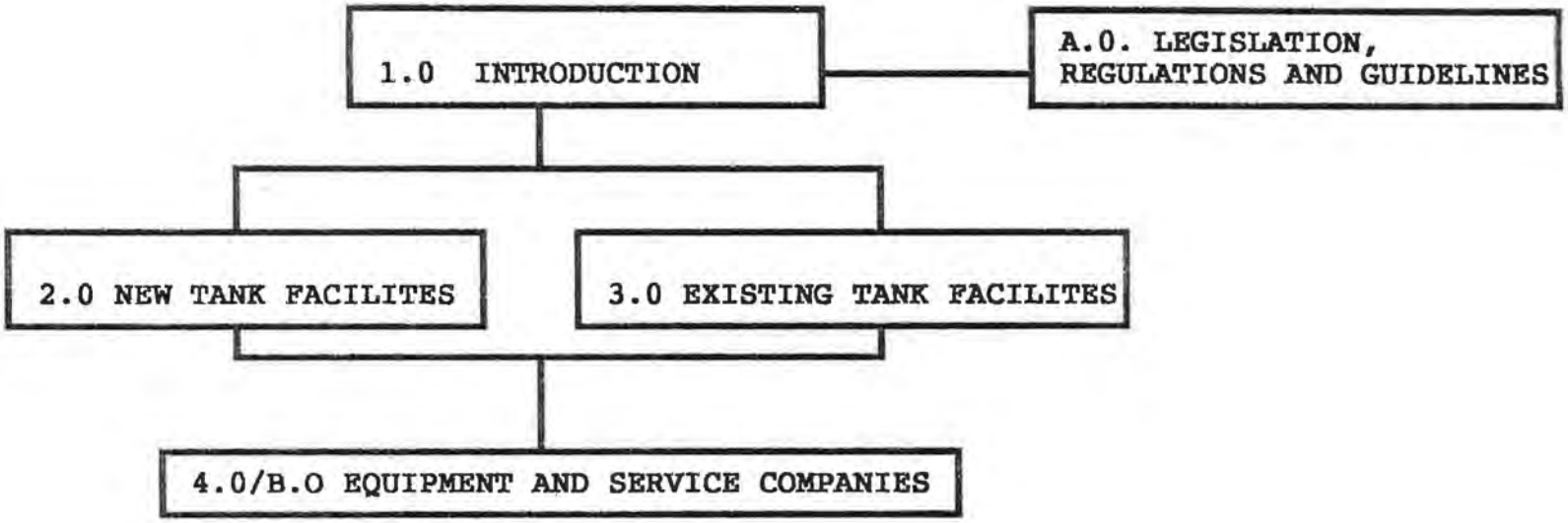
The general organization of the manual is shown by Figure 1-1.

Regulatory requirements and guidelines are introduced by Section 1.2 and listed in detail in Appendix A.

Basic management procedures are categorized by the age of the tank facility as either new (Part 2) or existing (Part 3). Descriptions of each category of procedures include a summary and references to pertinent sections of regulatory agency documents.

Dozens of companies in Ontario offer services and equipment related to tank management. Typically, these firms undertake work on both new and existing facilities. They are classified in Part 4 and listed in Appendix B by type of company.

FIGURE 1-1 FLOW CHART OF MANUAL ORGANIZATION



2.0 NEW TANK FACILITIES

2.1 MANAGEMENT COMPONENTS AND REQUIREMENTS

Installation of new tank facilities consists of four major procedures:

1) Registration
2) Site Assessment
3) Engineering Design and Equipment Selection
4) Installation

General requirements for these procedures tasks under the Environmental Code of Practice and Gasoline Handling Code are summarized by Figures 2-1 and 2-2.

FIGURE 2-1 FEDERAL CODE OF PRACTICE FOR NEW TANKS

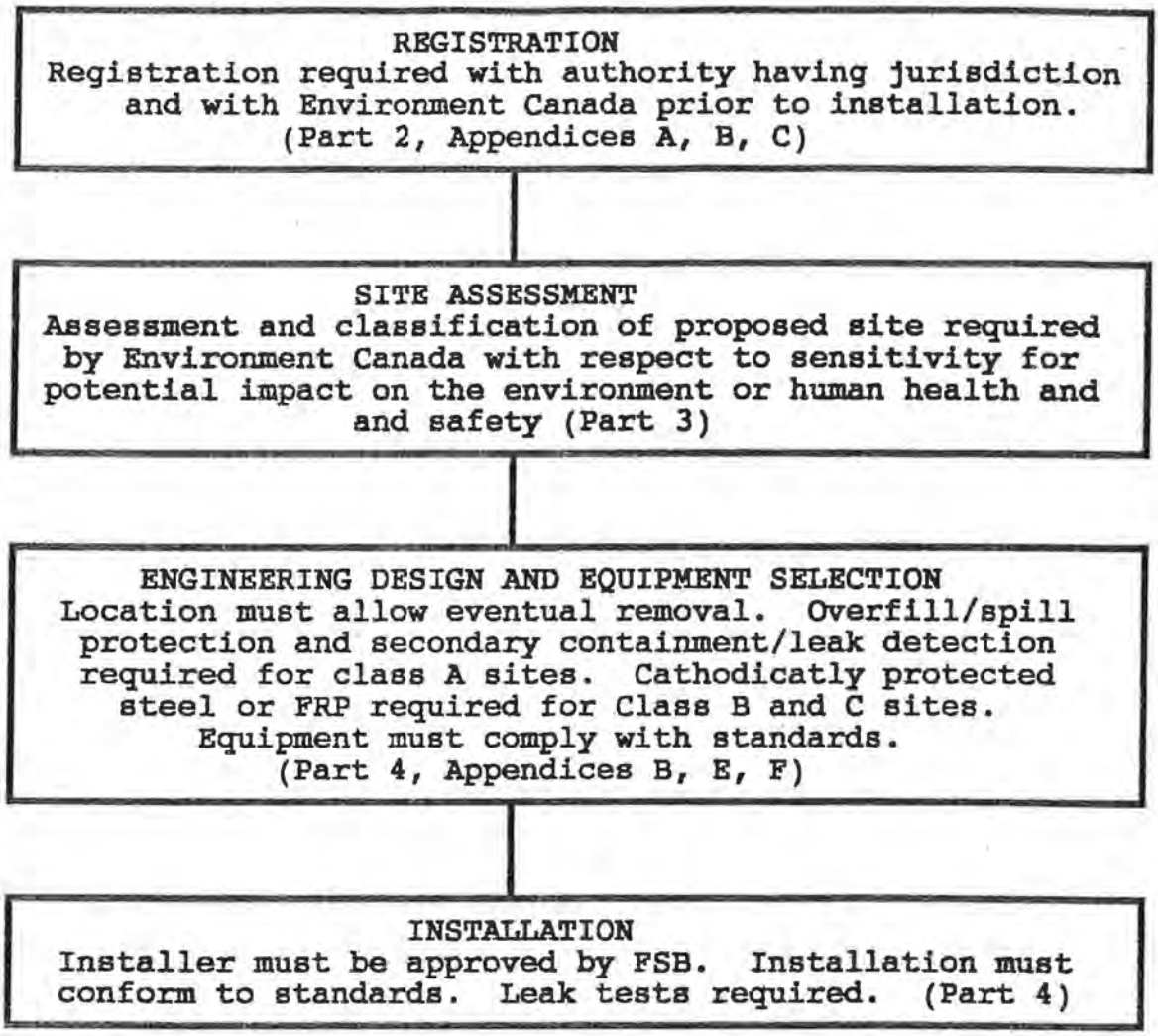
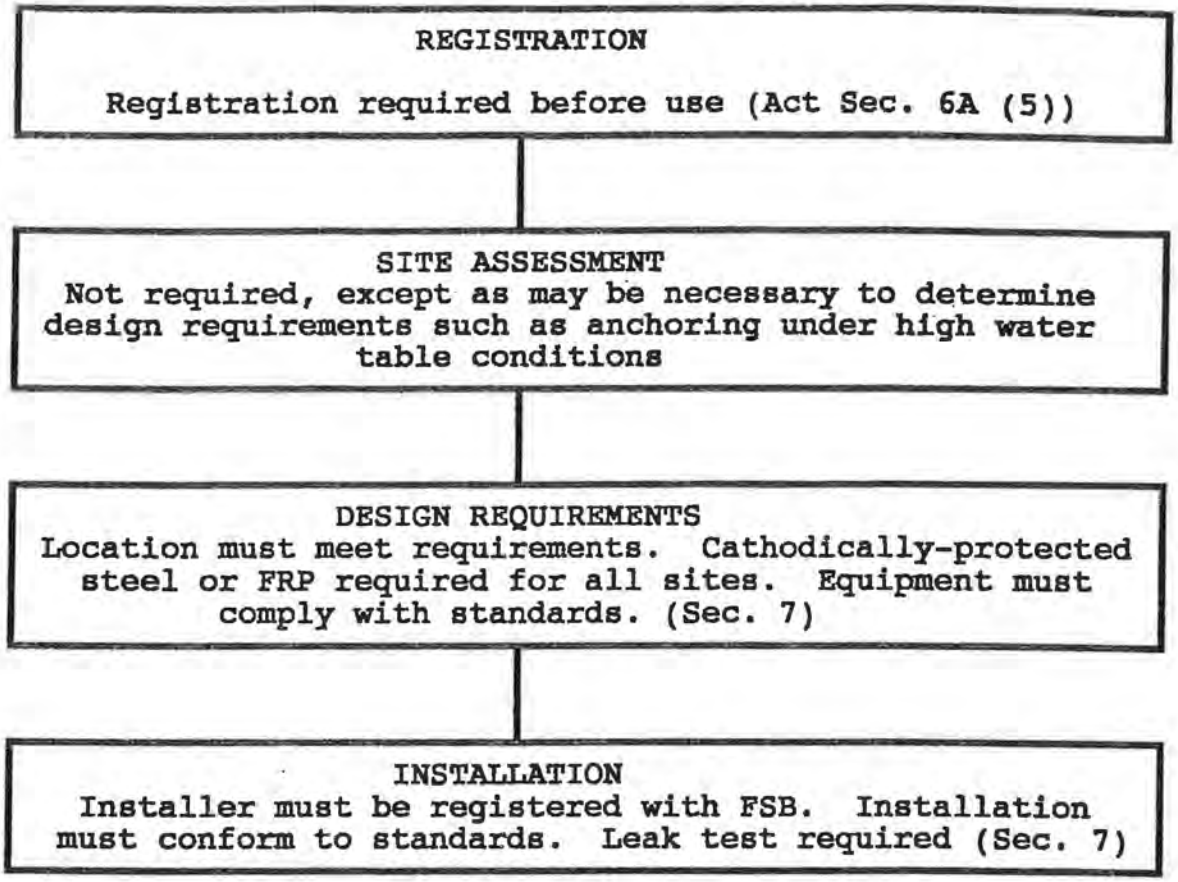


FIGURE 2-2 ONTARIO GASOLINE HANDLING CODE FOR NEW TANKS



2.2 REGISTRATION

Managers at Federal facilites are required to register new tanks with Environment Canada before the tanks are installed. The registration form is included in Appendix C.

Registration also is required with the FSB before the tank is used.

2.3 SITE ASSESSMENT

The ECD requires that proposed and existing sites be classified as Class A or Class B or Class C according to their sensitivity for potential impact on the environment and human health and safety. Class A sites are the most sensitive and Class C sites the least sensitive.

Presently, the classification of sites at Federal facilities is undertaken by Environment Canada. Detailed classification criteria are under development. General criteria recommended by the Code of Practice (Part 3) include, but are not limited to

- the quality and quantity of the ground water resource that could be affected by a leak,
- the density and proximity of wells,
- the local geology,
- the proximity of bodies of water,
- the proximity of densely populated areas,
- the proximity of subsurface structures and subsurface utility corridors,
- the presence in the area of geological, hydrogeological or environmental conditions, structures or animal, bird, aquatic or plant life that necessitates the taking of unusual precautions to prevent pollution of the environment.

Because most of the factors are related to subsurface conditions, the classification should be done or reviewed by a qualified hydrogeologist. Selection of outside consultants is described in Part 4 of this manual.

2.4 ENGINEERING DESIGN AND EQUIPMENT SELECTION

An outline of general requirements for engineering design of tank systems and selection of equipment is presented by Figure 2-3. Additional detailed requirements are described by the Environmental Code of Practice and Gasoline Handling Code.

Companies which perform design work or supply equipment described in Part 4 are listed in Appendix B of this manual.

2.5 INSTALLATION

The installation of new underground tank systems must be done by registered contractors. However, it is the responsibility of the owner to make sure that government regulations are followed and that an inspection is carried out (GHC_____).

Tank installation work performed by outside contractors at Federal facilities should be done under formal contract. The contents and specifications of contracts can vary widely depending upon the site and work required. A sample outline of a typical table of contents for an installation contract is shown by Figure 2-4.

Companies which install tank systems in Ontario are described in Part 4 and listed in Appendix B of this manual.

FIGURE 2-3 ENGINEERING DESIGN AND EQUIPMENT SELECTION FOR NEW TANKS

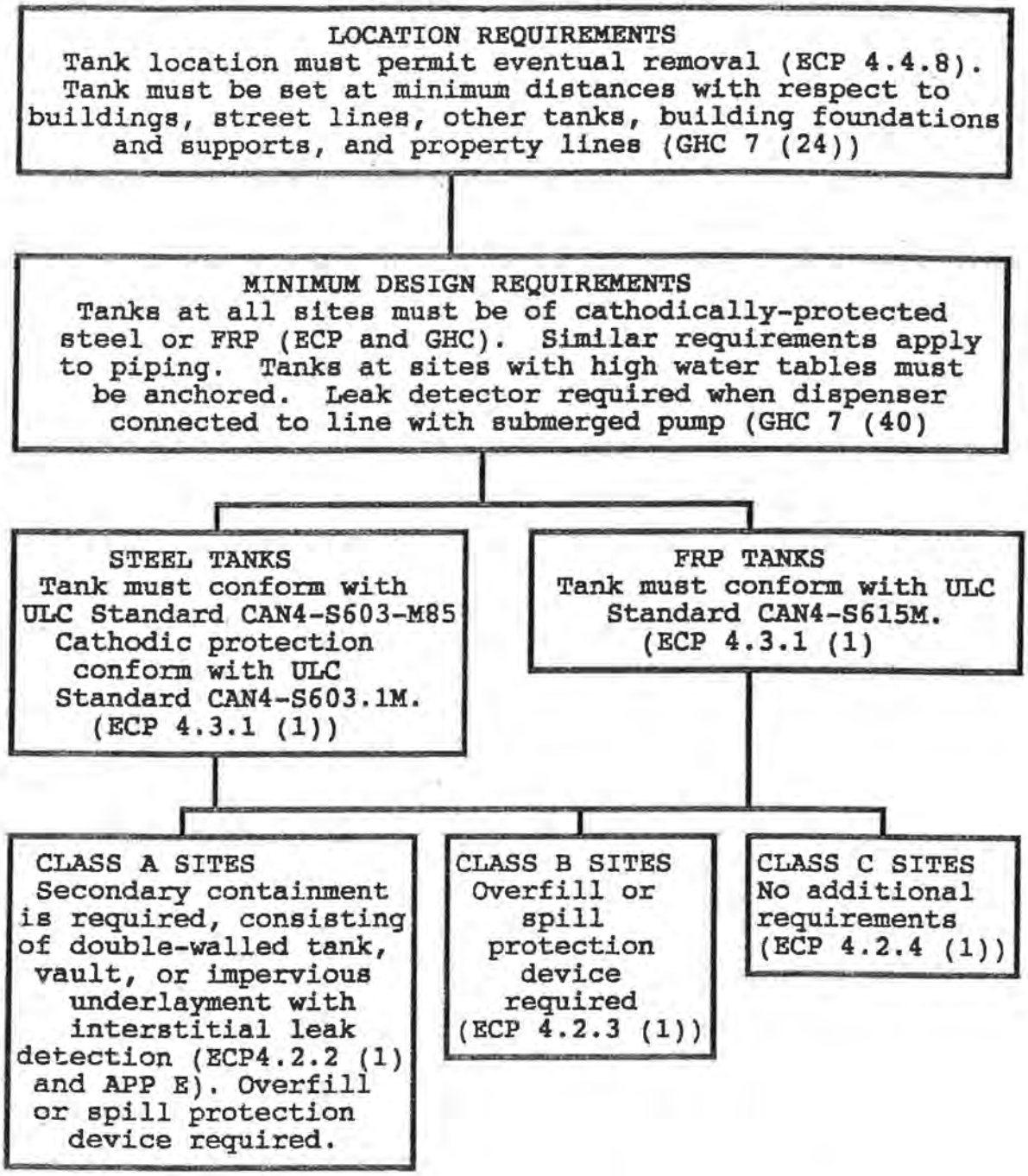


FIGURE 2-4 SAMPLE SPECIFICATION TABLE OF CONTENTS FOR INSTALLATION OF NEW TANKS

1) Scope of Work
    - Labour
    - Materials
    - Excluded Work

2) Contractor Qualifcation

3) Permits and Inspections

4) Insurance

5) Safety

6) Location
    - Tank and Piping Layout
    - Site Conditions

7) Materials
    - Tank Selection
        - Burial Depth
        - Anchoring System
    - Piping Selection
    - Spill Containment
    - Monitoring
    - Backfill

8) Site Clean Up

9) Workmanship and Code Compliance
    - Tightness Testing
    - Warranties

10) Costs
    - Terms of Payment
    - Extras

11) Schedules

3.0 EXISTING TANKS FACILITIES

3.1 MANAGEMENT COMPONENTS AND REQUIREMENTS

The management of existing tank facilities consist of six major procedures:

1) Registration
2) Site Assessment
3) Equipment Upgrading
4) Operations and Maintenance
5) Leaks
6) Abandonment

General requirements for these procedures under the Environmental Code of Practice and Gasoline Handling Code are summarized by Figures 3-1 and 3-2.

FIGURE 3-1 ENVIRONMENTAL CODE OF PRACTICE FOR EXISTING TANK FACILITIES

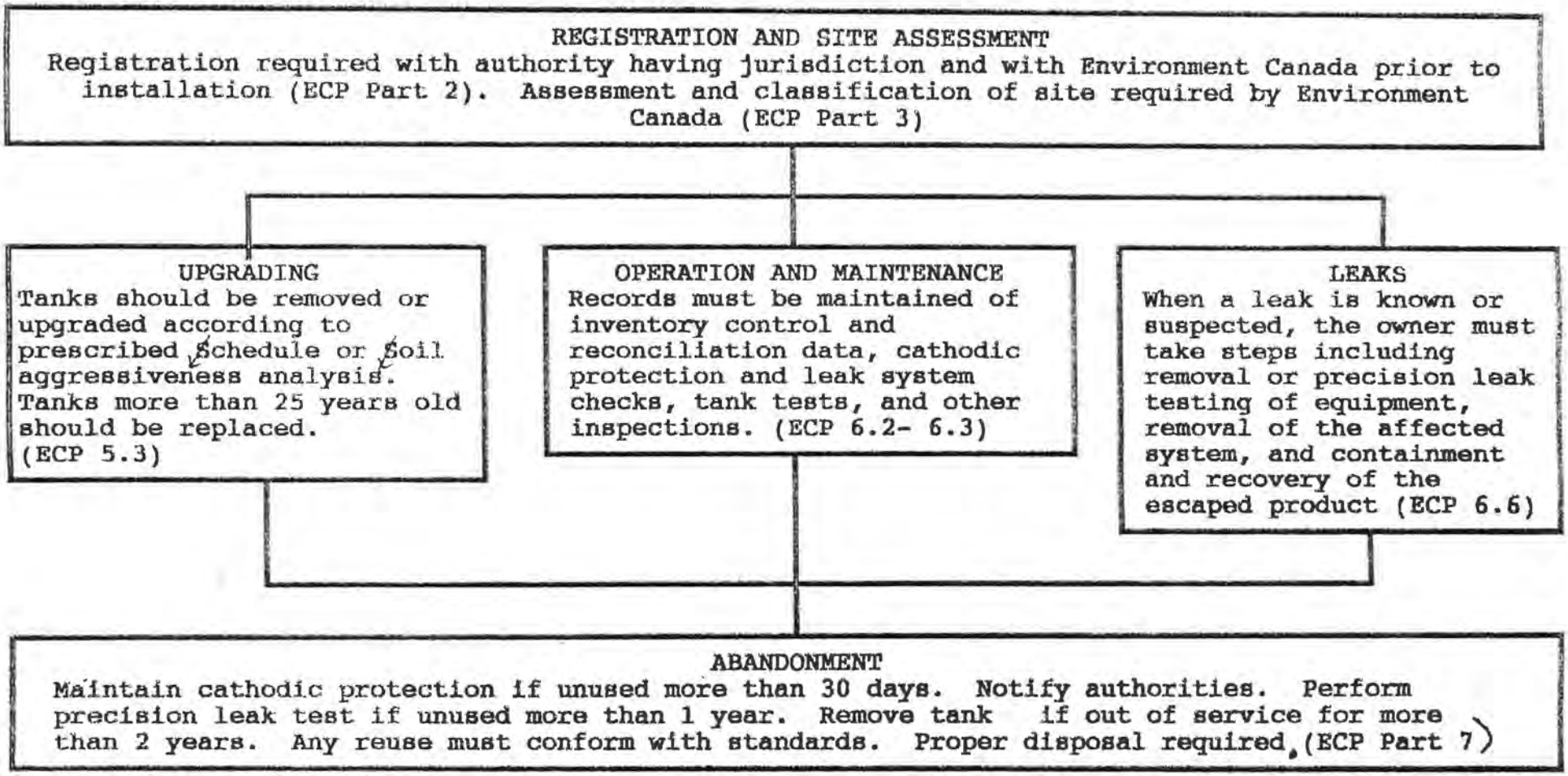
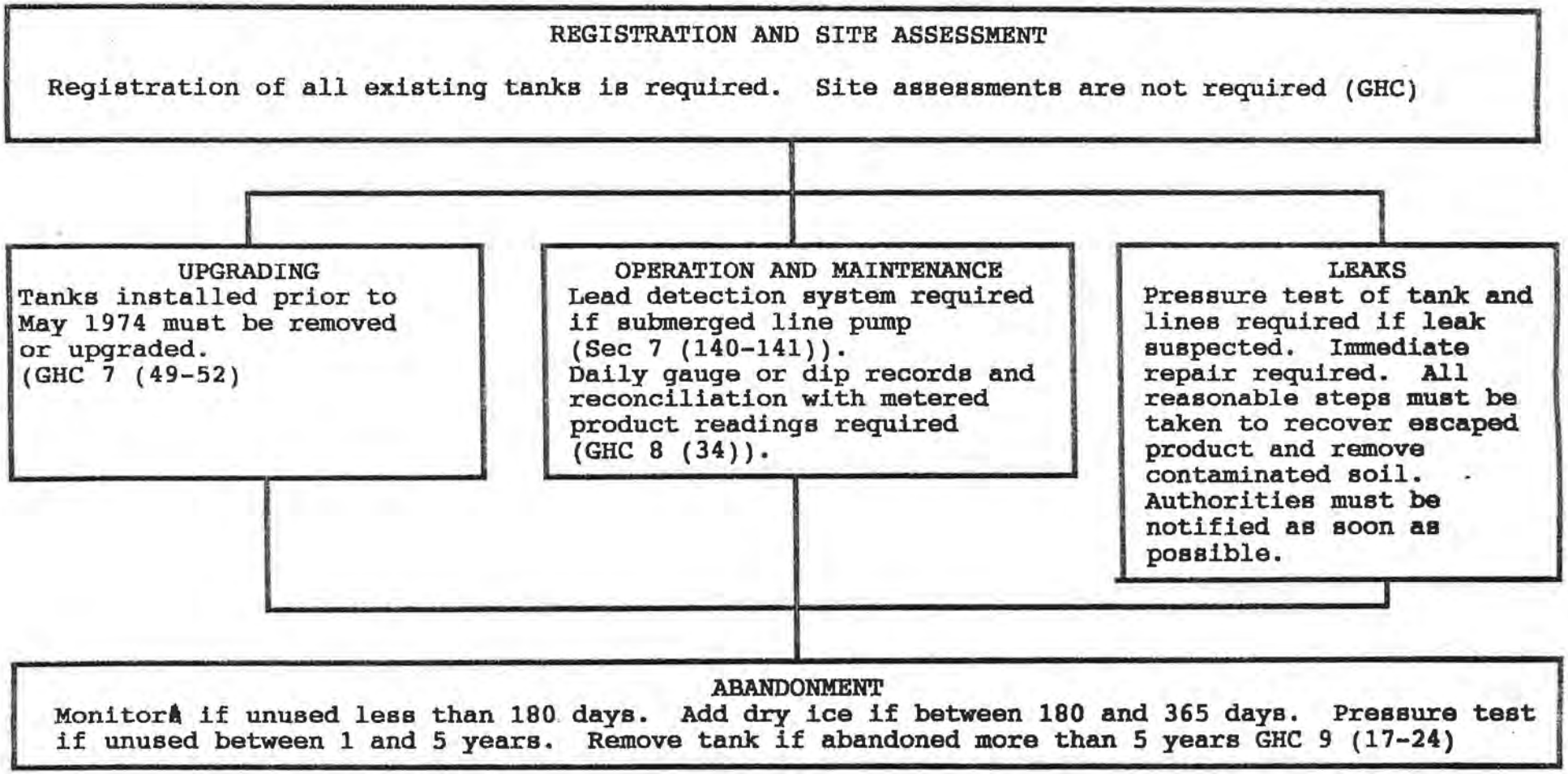


FIGURE 3-2 GASOLINE HANDLING CODE FOR EXISTING TANK FACILITIES



3.2 REGISTRATION AND SITE ASSESSMENT

Registration and site assessment requirements for existing tank facilities are similar to those for new facilities. These requirements re described in Sections 2.2 and 2.3 of this manual.

3.3 UPGRADING OF STEEL TANKS

Existing steel tanks may be protected against external corrosion by wrapping, coating, galvanizing or cathodic protection. If not, the tanks are unprotected.

Under the GHC (Sec. 7 (49-52), unprotected steel tanks and piping installed before May 1, 1974, must be removed or upgraded by January 1, 1991. The upgrading must be by replacement, lining, cathodic protection, or any other method approved by the Director of the FSB.

However, approval for unprotected tanks may be granted where they are installed in benign soil and the owner submits an engineering report to the Director of the FSB (GHC Sec. 7 (58)).

Under the ECP (5.3), tanks more than 25 years old should be replaced only.

3.4 OPERATION AND MAINTENANCE

Operation and maintenance requirements consist mainly of equipment maintenance, leak detection procedures and monitoring of cathodic protection equipment.

Acceptable leak detection according to the Environmental Code of Practice (Appendix F) may include the following:

- automated, frequent to continuous tank gauging system, capable of performing daily reconciliation,
- manual inventory control data that is statistically analyzed on at least a daily basis,
- secondary containment with interstitial monitoring, which includes double wall tanks,
- soil gas or vapour monitoring systems,
- hydrocarbon monitoring,
- other technologies acceptable to the authority having jurisdiction.

In Ontario, the GHC requires leak detection systems where the dispenser is connected to a line supplied by a submerged pump (Sec. 7 (140-141)). This system must be tested at least every 12 months and be maintained in good operating condition.

All underground tanks in Ontario subject to the Gasoline Handling Code must be closely monitored for product loss or entry of water (GHC, Sec. 8 (34)):

- tanks, except those at bulk plants, must be gauged or dipped daily for water and product,
- product and water dip or gauge readings must be recorded,
- the gauge or dip readings must be reconciled with product delivery and dispensing meter readings,

- when the reconciliation shows a possible product loss or when the water dip exceeds two inches it must be reported immediately to the owner,

- all gauge and dip records must be maintained for at least two years.

Under the ECP (6.4), inventory control procedures must also conform with the National Fire Code Subsection 4.3.17.

Corrosion protection monitoring at Federal facilities must conform (ECP 6.3.1) with

- CAN4-S603.1M for sacrificial anode systems (voltage between 850 mV and 1100 mV)

- PACE Report No. 87-1, Clause 5.5 (c) and Part 6.0 for impressed current systems.

3.5 LEAKS

3.5.1 LEAK SUSPECTED

When a leak is suspected or when the Director of the FSB requests, pressure tests of both the tank and lines must be conducted (GHC 8(35)). If there is any doubt about the results of the pressure tests, the tank or lines must be uncovered to allow visual inspection. Records of the tests must be kept.

3.5.2 LEAK CONFIRMED

Under the Gasoline Handling Code (Sec. 8 (35)), when a leak is confirmed the tank or line owner must

- arrange for immediate repair or replacement of the leaking systems.

- take all steps reasonable in the circumstances to recover escaped product and to remove product contaminated soil before installing a replacement tank or backfilling a repaired line, and

- report all leaks to the nearest FSB inspector or fire prevention authority as soon as practicable within 24 hours.

Tank owners and operators are also required to report immediately spills and leaks to the Ministry of the Environment (MOE) under requirements of the Environmental Protection Act.

For a relatively small leak, limited excavation of contaminated soil around the tank may be all that is required. For larger leaks, however, several stages of work may be necessary, as portrayed by Figure 3-3.

3.6 ABANDONMENT

General requirements for the abandonment of tanks are outlined by Figure 3-4. When a tank is abandoned permanently, the preferred procedure is removal and disposal. Sample instructions for this procedure are presented by Figure 3-5. In special cases, a tank may be abandoned in-place without removal (Figure 3-4).

FIGURE 3-3 INVESTIGATION AND REMEDIATION OF LARGE PRODUCT LEAKS

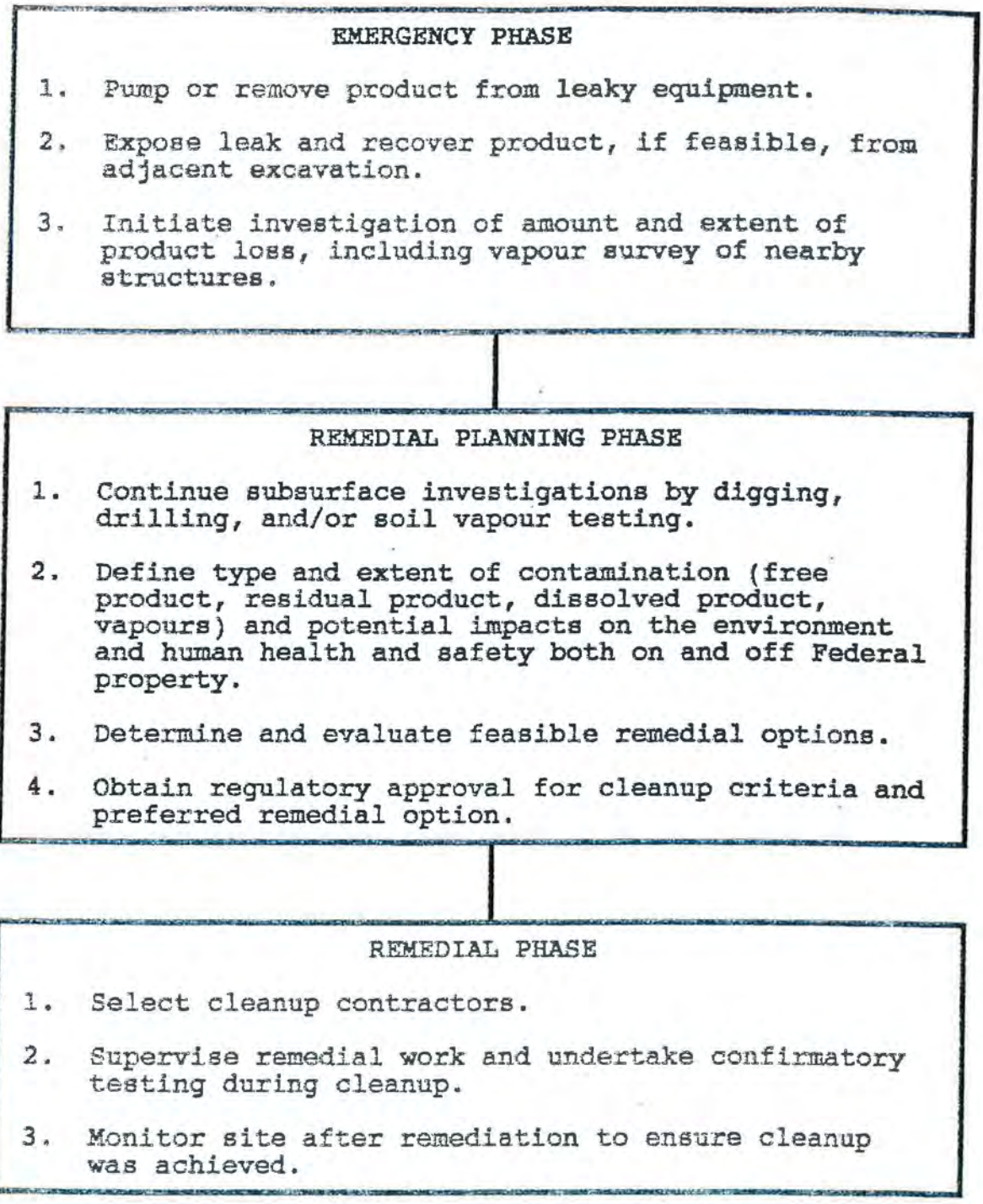


FIGURE 3-4 TANK ABANDONMENT REQUIREMENTS

Less than 180 days:

- Notify chief inspector of FSB before going out of service and upon reactivating.
- Record and safekeep monthly tank gauging measurements.
- Keep pipe covers, facilities and controls locked.
- Maintain and operate any impressed current protection.

More than 180 days:

- All of the above.
- Empty the tank of all Class I product and either refill with Class II product or remove explosive fumes with dry ice.

More than 365 days:

- All of the above.
- Preform a precision leak test before reactivating.

More than 2 years or when no further use is apparent:

- Removal is favoured over abandonment in place, but if the tank cannot be removed because it would endanger overhead facilities or heavy equipment access for removal is not available, then the tank can be abandoned in place by purging the tank of fumes, either having a licensed inspector check the interior for performations or perform a precision leak test, remove the sludge, cut holes in the tank top and fill the tank with sand, gravel, or concrete. Piping must be removed. An unearthed tank must be rendered gas free and unfit for further use.

  (GHC Sec. 17 to 23; E(P/C) Sec. 7.2 to 7.5)

FIGURE 3-5 SAMPLE INSTRUCTIONS FOR UNDERGROUND TANK REMOVAL AND DISPOSAL

1. Remove all residues and liquids from tank. Dispose correctly.
2. Excavate to the top of the tank.
3. Disconnect all fittings, except vent pipe, carefully draining any liquid into a container.
4. Purge the tank of flammable vapours.
5. Excavate and remove tank.
6. Excavate and dispose any contaminated soil from around tank.
7. Render tank unsuitable for reuse and dispose at an approved facility.

4.0 EQUIPMENT AND SERVICE COMPANIES

Dozens of companies in Ontario offer services and equipment related to the management of underground fuel tanks. Service companies include consultants, contractors, and analytical laboratories. Consultants undertake environmental studies, engineering design, and construction supervision. Contractors do the construction work. Some companies provide or attempt to provide both consulting and contracting services.

A partial listing of companies is contained in Appendix B. This part of the manual describes general sources of information. The services offered by companies can vary widely from company to company, office to office, and year to year. Accordingly the user of this manual is cautioned to ensure that the companies are capable of and experienced with undertaking the work that is required and specified.

4.1 ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering and environmental consulting firms may offer services in the areas of

- design of storage facilities,
- auditing and testing,
- environmental surveys and monitoring,
- hydrogeology studies, and
- remediation of contaminated sites.

The most comprehensive listing of engineering consulting firms in Ontario is contained in the Consulting Engineers of Ontario Directory, which is revised annually. Copies may be obtained from

Consulting Engineers of Ontario
86 Overlea Boulevard - Suite 403,
Toronto, Ontario
M4H 1C6
Tel: (416) 425-8027.

Many consulting firms which are active in the hazardous waste and spill cleanup fields are listed in the Directory of Hazardous Waste Services, available from

Corpus Information Services
1450 Don Mills Road,
Don Mills, Ontario
M3B 2X7
Tel: (416) 445-6641.

A partial listing of consusltants is contained in Appendix B of this manual.

4.2 TANK MANAGEMENT CONTRACTORS

Tank management contractors offer services in areas such as

- tank installation and removal,
- tank upgrading and protection programs,
- tank testing and monitoring, and
- auditing and instrumentation.

In Ontario, tank management contractors must be registered with the Fuels Safety Branch. The list of currently registered contractors may be obtained from

Fuels Safety Branch
Shipp Centre West Tower
3300 Bloor Street West - 4th Floor
Etobicoke, Ontario
M8X 2X4
Tel: (416) 234-6030.

Some tank management contractors also offer consulting, drilling, and waste management services.

4.3 DRILLING CONTRACTORS

Drilling contractors offer services in areas such as:

- sampling of soils and rock, and
- installation of ground water monitors.

Depending upon the firm, additional services may include geotechnical testing.

Under requirements of the Ontario Water Resources Act drillers who install ground water monitoring wells should be registered with the MOE

4.4 ANALYTICAL LABORATORIES

Analytical laboratories perform chemical testing of samples of petroleum products, soils, waters and air or soil vapours.

4.5 WASTE MANAGEMENT CONTRACTORS

Waste management contractors offer services in areas such as:

- excavation of contaminated materials, and
- haulage of unearthed tanks, contaminated soils, and waste water.

In Ontario, generators of waste are required to register with Environment Ontario under Regulation 309. The waste must be hauled by a licenced carrier under a manifest or list of cargo system.

Many contractors who undertake spill cleanup work are listed in the Province of Ontario Contingency Plan for Spills of Oil and Other Hazardous Materials (1989). Copies of this list of independent contractors are available from

Ministry of the Environment
Spills Action Centre
7 Overlea Boulevard - 5th Floor
Toronto, Ontario
M4H 1A8
Tel: (416) 965-9619

These and other contractors are also listed in the Corpus Directory of Hazardous Waste Services (see Section 4.1 of this manual).

4.6 EQUIPMENT SUPPLIERS

Equipment available for management of underground fuel tanks includes:

- steel and FRP tanks,
- leak detection sensors and alarms, and
- instrumentation.

A partial list of companies which provide this type of equipment is contained in Appendix B.

APPENDIX A

LEGISLATION, REGULATIONS, AND GUIDELINES

A.1 FEDERAL LEGISLATION, REGULATIONS, AND GUIDELINES

A.1.1

Environment Canada
Ontario Region
25 St. Clair Avenue East
Toronto, Ontario

Environment Canada
Industrial Programs
Oil and Gas Group
Hull, Quebec

- Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products (1989), Catalogue No. En40-359/1989E.

- Detection, Prevention and Remediation of Leaks from Underground Storage Tanks (February, 1989), Report EPS 2/PN/1.

A.1.2

Canadian Standards Association
118 Rexdale Boulevard
Rexdale, Ontario
M9W 1R3
(416) 747-4000

- Installation Code for Oil Burning Equipment, CSA Standard B139-1976.

- General Requirements for Oil Burning Equipment CSA Standard B140.0.

A.1.3

National Research Council of Canada
Ottawa, Ontario
K1A OR6

- National Fire Code of Canada (1985), Report NRCC 23175.

A.1.4

Canadian Petroleum Products Institute
275 Slater Street - Suite 1202
Ottawa, Ontario
K1P 5H9

- Guideline Specification for the Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks, PACE Report 87-1.

A.1.5 Underwriters Laboratories of Canada
7 Crouse Road
Scarborough, Ontario
M1R 3A9

- Standard for Steel Underground Tanks for Flammable and Combustible Liquids, CAN4-S603-M85.
- Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids, CAN4-S603.1-M85.
- Refurbishing of Steel Underground Tanks for Flammable and Combustible Liquids, CAN4-S603(A).
- Standard for Reinforced Plastic Underground Tanks for Petroleum Products, CAN4-S615-M85.
- Refurbishing of Reinforced Plastic Underground Tanks for Petroleum Fuels, CAN4-S615(A).

A.2 PROVINCIAL LEGISLATION, REGULATIONS AND GUIDELINES

A.2.1 Fuels Safety Branch
Shipp Centre West Tower
3300 Bloor Street West - 4th Floor
Etobicoke, Ontario
M8X 2X4
Tel: (416) 234-6030

- Gasoline Handling Act (RSO 1980 Chapter 185) and Regulation 439 (RRO 1980) also called the Gasoline Handling Code.
- Energy Act (RSO 1980 Chapter 139) and Regulation 288 (RRO 1980), also called the Fuel Oil Code.

A.2.2 Ministry of the Environment
135 St. Clair Avenue West
Toronto, Ontario
M4V 1P5
Tel: (416) 323-4321

Regional Offices:		
	Toronto	(416) 467-3000
	Sudbury	(705) 675-4501
	Thunder Bay	(807) 475-1205
	Kingston	(613) 548-6908
	London	(519) 661-2200
	Hamilton	(416) 521-7640

- Environmental Protection Act (RSO 1980, Chapter 141).
- Regulation 309 (RRO 1980) regarding Waste Management.
- Ontario Water Resources Act (RSO 1980, Chapter --).
- Guidelines for the Decommissioning and Cleanup of Sites in Ontario (1989).
- Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste (1985).

A.2.3 **Publications Ontario**
880 Bay Street - 5th Floor
Toronto, Ontario
M7A 1N8
Tel: (416) 326-5300 or 1-800-668-9938

Branch Stores: London
Ottawa

- Provincial government documents listed above.
- Government of Ontario Telephone Directory
- Ontario Municipal Directory

APPENDIX B

EQUIPMENT AND SERVICE COMPANIES

B.1 ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Acres International Limited
5259 Dorchester Road, P.O. Box 10001
Niagra Falls, Ontario
L2E 6W1
(416) 374-5407

A.J. Graham Engineering
Consultants Limited
P.O. Box 917, R.R. #5,
Ottawa, Ontario
K1G 3N3
(613) 822-1052

Arcturus
6862 Keiffer Street
Niagara Falls, Ontario
L2E 5K1
(416) 357-6424

Barenco Incorporated
10 Kodiak Crescent
Downsview, Ontario
M3J 3G5
(416) 222-7232

Beak Consultants Limited
14 Abacus Road
Brampton, Ontario
L6T 5B7
(416) 458-4044

Canviro Consultants
A Division of CH2M Hill Engineering Ltd
Suite 600, 180 King Street South
Waterloo, Ontario
N2J 1P8
(519) 579-3500

Central Projects Group Incorporated
7030 Woodbine Avenue, Suite 500
Markham, Ontario
L3R 1A2
(416) 470-6570

Clayton Environmental Consultants
6 Lansing Square
Toronto, Ontario
M2J 1T5
(416) 498-7444

Conestoga-Rovers and Associates Limited
651 Colby Drive
Waterloo, Ontario
(519) 884-0510
Branch Offices: Mississauga, Kincardine

Gartner Lee Limited
140 Renfrew Drive, Suite 102
Markham, Ontario
L3R 8B6
(416) 477-8400

Geocon Incorporated
3210 American Drive
Mississauga, Ontario
L4V 1B3
(416) 673-1664

Golder Associates
2180 Meadowvale Boulevard
Mississauga, Ontario
L5N 5S3
(416) 567-4444

B.1 ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Groundwater Technology Incorporated
1520 Trinity Drive, # 5,
Mississauga, Ontario
L5T 1N9

(416) 672-1700

Heath Consultants Limited
2085 Piper Lane
London, Ontario
N5Z 3S5
(519) 659-1144

Henderson, Paddon & Associates
945-3rd Avenue East, Suite 212
Owen Sound, Ontario
N4K 2K8
(519) 376-7612

Intera Kenting

Jagger Hims Limited
92 Davis Drive, Suite 210,
Newmarket, Ontario
L3Y 2N1
(416) 853-3303

Keystone Environmental Resources Incorporated
2233 Argentia Road
Mississauga, Ontario
L5N 2X7
(416) 858-0200

MacLaren Plansearch

Monenco Consultants Limited
160 Traders Boulevard, Unit 4
Mississauga, Ontario
L4Z 3K7
(416) 890-9995

Morrison Beatty Limited
4200 Dixie Road, Unit 12A
Mississauga, Ontario
L4W 1V7
(416) 624-9308

O'Connor & Associates Limited
3105 Unity Drive, #9
Mississauga, Ontario
L5L 4L2
(416) 820-6330

The Proctor & Redfern Group
45 Green Belt Drive
Don Mills, Ontario
M3C 3K3
(416) 445-3600

Terraqua Investigations Ltd.
232 King Street North, Suite 307
Waterloo, Ontario
N2J 2Y7
(519) 888-7892

Trow, Dames and Moore
7560 Airport Road
Mississauga, Ontario
L4T 2H5
(416) 793-9921

Water and Earth Science Associates Limited
P.O. Box 430,
Carp, Ontario
KOA 1LO
(613) 839-3053

B.2 TANK MANAGEMENT CONTRACTORS

Peel Petro-Chemical Services Inc.,
1680 Bonhill Road
Mississauga, Ontario
L5T 1C8
(416) 670-7867

Penny &Casson Co., Ltd.
3039 Kennedy Road
Agincourt, Ontario
MIV 1S7
(416) 298-1144

NOTE: A list of contractors registered with the FSB is on order.

B.3 DRILLING CONTRACTORS

All-Terrain Drilling Ltd
30661 Colby Drive,
Waterloo, Ontario
N2V 1C2
(519) 886-8810

Archer Drilling Ltd.
R.R. #1
Midhurst, Ontario
LOL 1XO
(705) 726-8338

Atcost Soil Drilling Incorporated
2160 Highway 7 West
Concord, Ontario
L4K 1B6
(416) 669-1253

DBM Technical Drilling Limited
747 Charlotte Street
Sudbury, Ontario
P3E 4C1
(705) 671-6107

Dominion Soil Investigation Inc.
104 Crockford Boulevard
Scarborough, Ontario
M1R 3C6
(416) 751-6565
Branch Offices: London, Sarnia,
Thunder Bay, Waterloo, Windsor

Eastern Soil Investigation Ltd.
80 Barbados Boulevard, Unit 17
Scarborough, Ontario
M1J 1K9
(416) 261-1333

F.E. Johnson Drilling Co. Ltd
P.O. Box 4134, Station 'E'
Ottawa, Ontario
K1S 5B2
(613) 822-2631

KX5 Drilling Limited
272 Oriole Court
Milton, Ontario
L9T 3R4
(416) 878-7570

London Soil Test Ltd./
5 Cottonwood Crescent
London, Ontario
N6G 2Y7
(519) 472-5486

Longyear Canada Inc.
11 Credit Stone Road, Unit 13
Concord, Ontario
L4K 2P1
(416) 669-1097

Malone's Soil Samples Co. Ltd.
36 Racine Road
Rexdale, Ontario
M9W 2Z3
(416) 748-9060

Marathon Drilling Co. Ltd.
P.O. Box 8173, Alta Vista Terminal
Ottawa, Ontario
K1G 3H7
(613) 822-0571

Master Soil Investigation Ltd.
192 Toryork Drive
Weston, Ontario
M9L 1X6

B.3 DRILLING CONTRACTORS

(416) 749-1062

Morton Geotech Inc.
P.O.Box 69, Stn. 'M'
Toronto, Ontario
M6S 4T2
(416) 762-7474

North Bay Drilling
Division of National Geotech Inc.,
121 Kennedy Avenue, Suite 108
Toronto, Ontario
M6S 2X8
(416) 766-0629
(416) 762-2293

PVK & Sons Drilling Limited
R.R. #2
Burford, Ontario
NOE 1AO
(519) 449-5175

V.A. Wood Associates Limited
1080 Tapscott Road - Unit 24
Scarborough, Ontario
M1X 1E7
(416) 292-2868

B.4 ANALYTICAL LABORATORIES

ARECO Canada Incorporated
28 Concourse Gate
Nepean, Ontario
K2E 7T7
(613) 228-1145

Barringer Laboratories
5735 McAdam Road
Mississauga, Ontario
L47 1N9
(416) 890-8566

Bondar-Clegg & Company Limited
5420 Canotek Road
Ottawa, Ontario
K1J 8X5
(613) 749-2220

Chemex Labs Limited
450 Matheson Boulevard East, Suite 54
Mississauga, Ontario
L4Z 1R5
(416) 890-0310

Chem-King Incorporated
King Technology Division,
R.R. # 3
Barrie, Ontario
L4M 4S5
(705) 737-1221

Environmental Applications Group
475 Cochrane Drive, Unit 13
Markham, Ontario
L3R 9R5
(416) 479-6107

Enviroclean
921 Leathorne Street
London, Ontario
N5Z 3M7
(519) 686-7558

Environment Protection Laboratories
6850 Goreway Drive
Toronto, Ontario
L4V 1P1
(416) 673-3255

Mann Testing Laboratories Limited
5550 McAdam Road
Mississauga, Ontario
L4S 1P1
(416) 890-2555

Monenco Science and Technology
70 Hanlan Road, Unit 1
Woodbridge, Ontario
L4L 3P6
(416) 850-0111

Ortech International
2395 Speakman Drive
Mississauga, Ontario
(416) 822-411 ← L5K 1B3

Rand R Laboratories Limited
1557 Fair Avenue
Peterborough, Ontario
K9K 1T1
(705) 748-1506

T.S.L. Environmental Laboratories Inc.
1140 Fewster Drive
Mississauga, Ontario
L4W 1A1
(416) 625-1544

Walker Laboratories
2800 Thorold Townline Road
P.O. Box 100
Thorold, Ontario
L2V 3Y8
(416) 227-4142

B.4 ANALYTICAL LABORATORIES

Wellington Environmental Consultants
Incorporated
398 Laird Road,
Guelph, Ontario
N1G 3X7
(519) 822-2436

XRAL Environmental
1885 Leslie Street
Don Mills, Ontario
M3B 3J4
(416) 445-5809

Zenon Environmental Incorporated
845 Harrington Court
Burlington, Ontario
L7N 3P3
(416) 639-6320

B.5 WASTE MANAGEMENT CONTRACTORS

Accurate Industrial Waste Limited
1929 Highway 7 West
Concord, Ontario
L4K 1V5
(416) 223-0436

Barenco Incorporated
10 Kodiak Crescent
Downsview, Ontario
M3J 3G5

Beeline Carriers Limited
211 Lanark Street
Stoney Creek, ontario
L8E 2Z9
(416) 560-0101
Branch Offices: Goderich, Milton

Browning-Ferris Industries Limited
161 Bridgeland Avenue
Toronto, Ontario
M6A 1Z1
(416) 789-7341
Branch Offices: Chatham, London, Oshawa, Thunder Bay, Windsor

Cannington Excavating 1989 Ltd.
R.R. #1, P.O. Box 604,
Gormley, Ontario
LOH 1GO
(416) 887-1416

Chem-King Incorporated
Chemical and Petro Waste
(CPW) Disposal Division,
R.R.#3
Barrie, Ontario
L4M 4S5
(705) 737-1221

Environmental Management Corporation
2128 River Road
London, Ontario
N6A 4C3
(519) 451-6630

Laidlaw Environmental Services Limited
265 North Front Street, Suite 502
Sarnia, Ontario
N7T 7X1
(519) 332-0720
Branch Offices: Burlington, Guelph, Mississauga, London, St. Catharines, Sarnia, Windsor

O.H. Materials of Canada Limited (OMC)
2192 Wyecroft Road,
P.O. Box 7010
Oakville, Ontario
L6J 6L5
(416) 847-1700

Philip Environmental Services Corporation
52 Imperial Street
Hamilton, Ontario
L8L 7W2
(416) 544-6687

Sanexan Internation Incorporated
3027 Harvester Road, Unit 202
Burlington, Ontario
(416) 681-3366

Waste Management of Canada Incorporated
(WMI)
55 Fenmar Drive
Weston, Ontario
M9L 1M4
(416) 741-1600

B.5 WASTE MANAGEMENT CONTRACTORS

Woodington Systems Incorporated
P.O. Box 100
Thorold, Ontario
L2V 3Y8
(416) 262-4227

B.6 EQUIPMENT SUPPLIERS

Clemmer Industries (1964) Ltd
P.O. Box 130
Waterloo, Ontario
(519) 884-3210

EMCO Supply
65 Huxley Avenue
Weston, Ontario
(416) 826-0257

EMCO Wheaton Ltd.
136 The East Mall
Toronto, Ontario
M8Z 5M2
(416) 231-4141

E.O. Butts Consultants Ltd.
78B Jamie Street
Nepean, Ontario
K2E 6T6
(613) 226-3050

Liquidex Equipment Inc.
8500 Jules-Leger
Ville D'Anjou, Quebec
H1J 1A7
(514) 351-6900

MFM Industries
P.O. Box 2159, Sta. A
Moncton, N.B.
(506) 857-2700

OPW Dover Corp. (Canada) Ltd
31 Progress Court, Unit 10
Scarborough, Ontario
M1G 3V5
(416) 439-9713

Petroquip Ltd.
33 Mallard Road
Don Mills, Ontario
M3B 1S4
(416) 449-4725

Pipe Specialties of Canada
705 Progress Avenue, Unit 38
Scarborough, Ontario
(416) 431-7780

RNG Equipment Ltd.
32 Stoffel Drive
Rexdale, Ontario
M9W 1A8
(416) 249-7383

Shaw Pipe Protection Ltd.
25 Bethridge Road
Rexdale, Ontario
M9W 1M7
(416) 743-7111

APPENDIX C

GOVERNMENT FORMS

Note: Appendix C is missing in the original document.
L'appendice C est manquante dans le document original.