
Columbia South Shore Groundwater Protection Program



Program Implementation Guidance

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CITY OF PORTLAND
WATER BUREAU



CITY OF GRESHAM
ENVIRONMENTAL
SERVICES



CITY OF FAIRVIEW
PUBLIC WORKS
DEPARTMENT



Columbia South Shore Groundwater Protection Program Program Implementation Guidance

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In compliance with Title VI of the Civil Rights Act and Title II of the Americans with Disabilities Act, it is the policy of the City of Portland that no person shall be denied the benefits of or be subjected to discrimination in any City program, service, or activity on the grounds of race, color, national origin, or disability. To help ensure equal access to City programs, services and activities, the City will provide reasonable translation and interpretation services, and will reasonably modify policies/procedures and provide auxiliary aids/services/alternative formats to persons with disabilities. Please notify us in advance of scheduled events if accommodations or translations are needed. To make requests, file complaints, or for additional information, please contact (Program Contact Number), use City TTY 503-823-6868, or use Oregon Relay Service: 711 or visit the City's Civil Rights Title VI & ADA Title II web site.

1.0 Introduction

1.1 Purpose

Groundwater Protection Program

The purposes and objectives of the Columbia South Shore Groundwater Protection Program (GWPP) are to:

- Maintain the quality of groundwater used as drinking water;
- Set minimum standards for protection of groundwater in the regulated area; and
- Provide recommendations for facilities and transportation authorities to assist them in providing groundwater protection for onsite chemical usage or activities.

The Groundwater Protection Program requirements are focused on efforts to protect groundwater quality, based on the types of chemicals present onsite using the structural and non-structural measures described herein. The requirements and recommendations are intended to:

- Complement other requirements where deemed necessary;
- Be consistent with other requirements;
- Be balanced and implementable, and
- Establish consistency across jurisdictional boundaries

Since the protection area encompasses portions of the Cities of Portland, Gresham and Fairview, these requirements and recommendations are intended to ensure consistency and equity.

The regulated area (i.e., the designated groundwater protection area) is based on a groundwater model simulation of the 30-year time of travel to the production wells of the Columbia South Shore Groundwater Protection Area (GWPA). The area (see Figure 1¹) includes portions of the Cities of Portland, Gresham, and Fairview. The groundwater resource protection areas include the:

City of Portland

Columbia South Shore Well Field Wellhead Protection Area

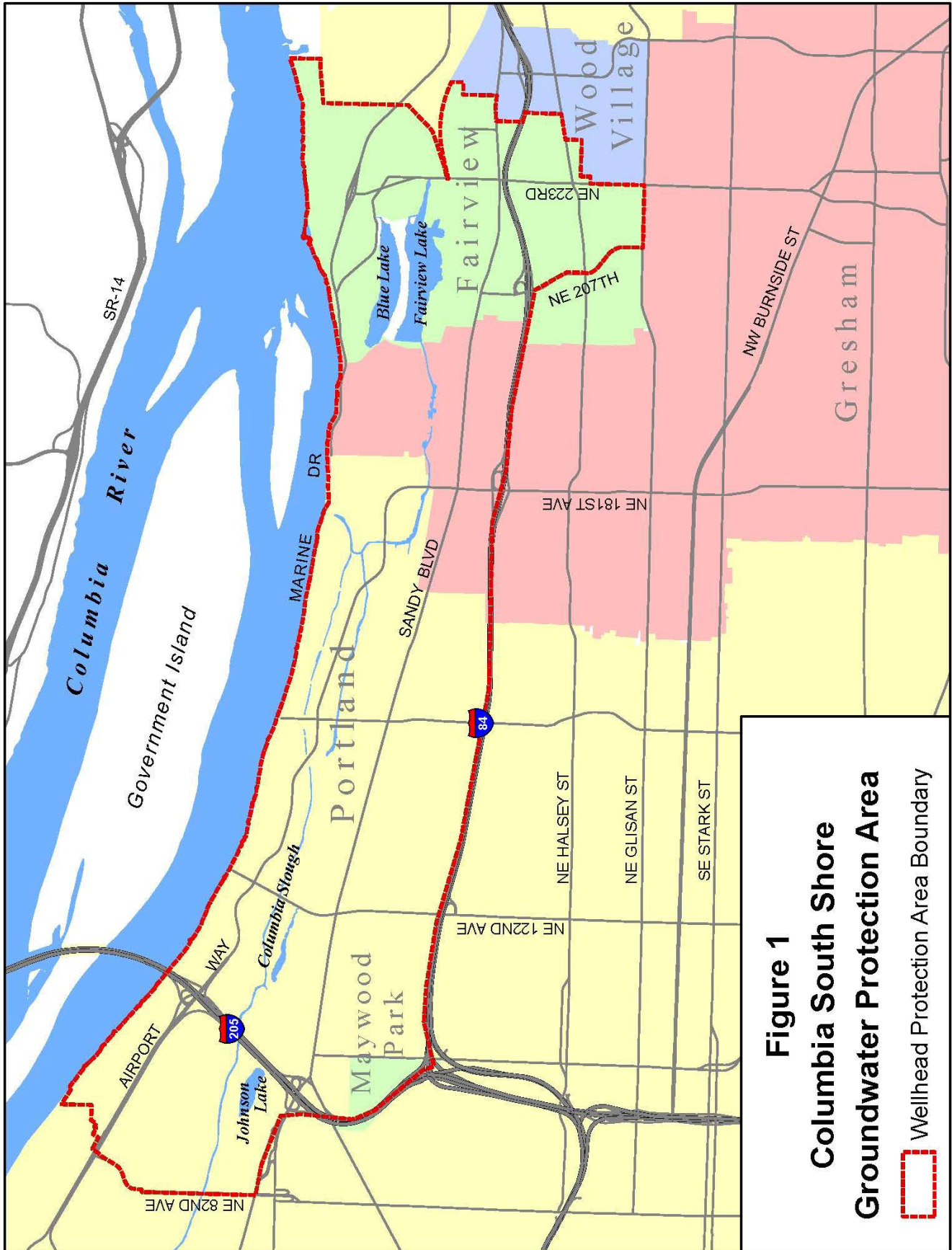
Columbia South Shore (COSS) Plan District

Cascade Station/Portland International Center (CS/PIC) Plan Districts

City of Gresham

Well Field Protection Area

¹ Figure 1 has been reproduced from the City of Portland Code Chapter 21.35 – Wellhead Protection and Figure 1 of the Columbia South Shore Well Field Wellhead Protection Area Reference Manual.



City of Fairview

Wellhead Protection Overlay District

Multnomah County

Blue Lake Park (City of Fairview)

Area between Blue Lake and Fairview Lake (Interlachen Community)

Program Implementation Guide

This implementation guide has been prepared for Portland and Gresham Inspectors, City of Portland, City of Gresham, and City of Fairview staff responsible for implementing the program, regulated businesses, and technical assistance personnel working with businesses in the GWPA. It is intended to be a resource tool that can be used in conjunction with the program's technical requirements that are defined in the *Columbia South Shore Well Field Groundwater Protection Area Reference Manual* ("Reference Manual", City of Portland, January, 2017).

This guide contains references and examples for readily available resources, equipment and facilities intended to prevent spills or unintentional releases of regulated hazardous materials and, in the event of a spill, devices and equipment that can be used to prevent spilled materials from flowing off-site or into the ground.

There are nine general categories under which hazardous materials are referenced to help identify what may be available to help at a site. Each category has a reference to the requirements in the Reference Manual.

Table 1 Cross-References to Reference Manual	
Hazardous Material Activity or Spill Control Category	Reference Manual Sections
Chemical storage / secondary containment – containers, tanks indoor/outdoor storage and containment, etc.	3.3; 3.5
Containment surfaces or coating systems – epoxy, crack and damage repair, types of surfaces, etc.	3.3.2; 3.4.2; 3.5.2
Chemical transfer – e.g. loading docks and design, indoor chemical transfer, material handling, mode of transportation.	3.4; 3.6.1
Runoff control – Storm drain covers, valves, etc.	3.3.2; 3.4.1.1.1; 3.4.1.1.2; 3.4.2; 3.5.1.1.1; 3.5.1.1.2; 3.5.1.1.3; 3.5.2; 3.6.1; 3.6.2; 3.7.1.2; 3.7.1.3; 3.7.2; 3.8.1.2
Spill response and clean-up – spill kits and absorbents.	3.1.4; 3.4.2; 3.5.2; 3.6.2; 3.7.1.1
Runoff treatment – oil-water separators, etc.	3.5.1.1.2; 3.5.1.1.3; 3.5.2; 3.6.2; 3.7.1.2; 3.7; 1.3; 3.8.1.2; 3.10
Required Signage.	3.4.2; 3.5.2; 3.7.2
Fuel dispensing.	3.7
Training and Operational Best Management Practices (BMPs).	3.1.4; 3.1.5; 3.7.1.1; 3.9

1.2 Compliance Schedule

The Groundwater Protection Program went into effect in the regulated areas of Portland, Gresham, and Fairview in 2003.

Existing Facilities

Initial Program Implementation

The Groundwater Protection Program was phased in over the course of 5 years for businesses that were in existence when the program was adopted. As of June 30, 2008, all existing facilities subject to the initial adoption of the Groundwater Protection Program in 2003 were expected to be in full compliance with all applicable requirements.

Implementation of Future Program Modifications

Periodically, all elements of the Groundwater Protection Program are reviewed by the City, including the regulated area, substances regulated, and the facility technical requirements. If substantive changes are made to the Program such as adding additional areas regulated or adding new regulated hazardous substances beyond those initially adopted in 2003, newly regulated facilities will be provided a two-year phase-in period to comply with the new or revised requirements. For existing facilities that are already subject to the Groundwater Protection Program, but may have additional, new requirements as a consequence of Program modifications, the two-year phase-in period only applies to the new or revised requirements.

The phase-in compliance milestones are shown in Table 2. For example, if new hazardous substances are added to the program, a facility will have 12 months to implement all applicable Phase 1 and Phase 2 technical requirements, and 24 months to implement applicable Phase 3 and Phase 4 requirements.

Table 2 Non-Conforming Uses^a - Implementation Schedule	
Functional Area	Compliance Deadline
Phase 1	
1. All Hazardous Material and Fuel Container Storage Less Than 10 Times Table 3 Thresholds, 2. All Intra-Site Hazardous Material and Fuel Transfer Operations	12 Months After Non-Conforming Use Becomes Subject to Regulation
Phase 2	
1. All Hazardous Material and Fuel Container Storage Greater Than 10 Times Table 3 Thresholds, 2. Hazardous Material and Fuel Container Load/Unload Operations	12 Months After Non-Conforming Use Becomes Subject to Regulation
Phase 3	
1. All Hazardous Material and Fuel Tank Management, 2. Hazardous Material and Fuel Tanker/Railcar Load/Unload Operations	24 Months After Non-Conforming Use Becomes Subject to Regulation
Phase 4	

1. Hazardous Material Transportation Routes and Public Underground Injection Control (UIC) Systems.	24 Months After Non-Conforming Use Becomes Subject to Regulation
<p>^aAs used here, “non-conforming use” means that a regulated hazardous material activity or a functional area where hazardous materials are handled (and exceeds the thresholds defined in Section 1.3 of the <i>Reference Manual</i>) does not comply with the applicable requirements of Section 3 of the <i>Reference Manual</i>.</p> <p>Compliance deadlines that are referenced to 12 or 24 months after a non-conforming use becomes subject to regulation are only implemented if the City amends or revises the Groundwater Protection Program regulations to include additional hazardous materials or more stringent technical requirements beyond those promulgated in the July 10, 2010 version of the <i>Reference Manual</i>.</p>	

New Facilities

Compliance with the Groundwater Protection Program requirements applies to new development² at the time of initial operations (See Section 2.1 of the *Reference Manual*). No ‘phase-in’ period exists.

An initial compliance determination will typically be completed by the Portland or Gresham Fire Bureau as a condition of issuing an Occupancy Permit at a new facility. To determine the requirements, the cities of Portland, Gresham, and Fairview require that programmatic reviews be completed during the development permit process. Relevant requirements will be established during this review process, though program compliance is the ultimate responsibility of the facility proponent.

Modified Facilities

Compliance with the Groundwater Protection Program requirements applies to “modified facilities” at the time facility modifications are made (See Section 2.2 of the *Reference Manual*). No ‘phase-in’ period exists unless the modifications are being implemented solely to comply with Groundwater Protection Program implementation changes made after June 25, 2003 (see Existing Facilities and Table 2, above).

Examples of a ‘modified facility’ could include:

- Addition of new manufacturing space that includes areas where regulated Hazardous Materials are stored or used, and the aggregate facility-wide quantity of Hazardous Materials is above threshold quantities.
- Conversion of existing warehouse space into a manufacturing area where regulated Hazardous Materials are stored or used, and the aggregate facility-wide quantity of Hazardous Materials is above threshold quantities.

Only the modified portion of the facility subject to the development permit will be subject to the functional area requirements as a condition of the development permit. Other existing functional areas where regulated Hazardous Materials are used, stored, or handled are subject to the compliance timelines identified in Table 2, above.

² A “new development” shall mean the intended construction of one or more buildings on land that is not currently occupied by buildings or other structures suitable for any industrial or commercial purpose, including the situation where all prior buildings or structures on the land have been demolished in preparation for a wholly new use of the land. All other planned construction, alteration, or reconstruction at a commercial or industrial facility, whether currently in operation or where operations have been suspended or halted but existing buildings or other structures are suitable for industrial or commercial use, with or without alteration, reconstruction and new construction, shall be considered an “existing development” controlled by the provisions of Section 2.2 of the *Reference Manual*.

Put another way, a facility that is modifying a portion of its facility does not automatically subject the remainder of the facility where Hazardous Materials are used, stored or handled to be upgraded as part of the facility modifications.

1.3 Regulated Chemicals

A facility that stores or uses, in the aggregate, any chemical, chemical mixture, or waste material defined in Section 1.3.1 or 1.3.2 of the Reference Manual that exceeds the threshold quantity defined in Table 3, is subject to the GWPP. When determining the threshold quantity for a particular site, those chemicals defined in Section 1.4 of the Reference Manual (Exempt Uses and Materials) are exempt and do not need to be considered when determining the site threshold quantity.

Table 3 Chemical Category Thresholds	
Category of Material	Threshold Quantity^{a,b}
Hazardous Materials	As Noted
Halogenated Solvents	10 gallons or 100 lbs
Hazardous Substances	50 gallons or 400 lbs
Hazardous Wastes	30 gallons or 220 lbs
Fuel^c	50 gallons or 400 lbs ^d
Petroleum Products^c	50 gallons or 400 lbs ^{d,e} (for Section 5 Reporting Only)
^a As defined in Section 1.3.1 of the Reference Manual, a 10% by weight concentration threshold applies to each chemical category, except Hazardous Wastes and Petroleum Fuels. That is, products or chemical mixtures containing, before use, less than 10% by weight of a Hazardous Material need not be considered in the threshold quantity calculation. ^b If a material is classified in more than one chemical category, the more restrictive threshold quantity shall apply. ^c Petroleum Products or Fuels that are known to contain greater than 10% by weight of any category of Hazardous Materials or are designated as a Hazardous Waste, as determined by reviewing the product's MSDS or other information, shall be considered a Hazardous Material and regulated under that category (see also note b, above). ^d For Petroleum Products and Fuel only, the threshold quantity determination is made based on the capacity of the largest single container or tank. That is, the threshold quantity is not triggered unless the facility stores Petroleum Products or Fuel in any single container or tank that has a capacity greater than 50 gallons. ^e For Petroleum Products EXCEPT Fuel, this threshold quantity is for determining the applicability of Section 5.1 – Annual Hazardous Material Inventory Report. Petroleum Products not otherwise defined as a Hazardous Material or Fuel are not subject to Section 3 – Requirements and Recommendations.	

2.0 Required Operational Source Control Best Management Practices (BMPs)

2.1 Overview

REGARDLESS of improvements that a regulated facility may be required to install or use to store and contain its regulated Hazardous Materials, overall compliance with the GWPA requirements will also be based on the facility adequately demonstrating that it has implemented certain Operational Source Control Best Management Practices (BMPs) discussed in this section (see Section 3.1.4 of Reference Manual).

Operational Source Control BMPs are procedures or practices that help prevent spills from entering stormwater or groundwater. Examples include formation of a pollution prevention team, good housekeeping practices, preventive maintenance procedures, spill prevention and cleanup, employee training, periodic inspections of Hazardous Material or Fuel sources, and record keeping.

Operational BMPs can also include process changes, raw material/product changes, and recycling wastes.

While the Reference Manual does not expressly require the preparation of written compliance plans, the Inspector will be looking for evidence that the requirements of Section 3.1.4 of the Manual are being met. It is recommended (but not required) that the facility prepare a brief written plan that covers the Operational BMP requirements, below, and how compliance will be maintained.

If the facility has already prepared written plans for any of the regulatory programs listed below, they may help, or completely satisfy GWPP requirements. To satisfy the requirements, these plans must address regulated Hazardous Materials covered by the Groundwater Protection Program.

- Spill Prevention Control and Countermeasures Plan (SPCC) prepared in accordance with 40 CFR 112. An SPCC plan is required if the facility stores more than 1320 gallons of oil or petroleum products.
- Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 or 265. A Contingency plan is required if the facility generates more than 2,200 lbs of hazardous waste per month.
- Storm Water Pollution Control Plan (SWPCP) prepared in accordance with 40 CFR 122. A SWPCP must be prepared if the facility is required to have a 1200-Z or 1200-COLS Storm Water National Pollutant Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ).
- Hazardous Materials Management Plan (HMMP) prepared in accordance with Appendix H of the Oregon Fire Code. Depending on the type of occupancy and

type/volume of hazardous materials managed at a facility, the Fire Department may have required the facility to prepare a HMMP.

- Hazardous Material or Fuel Response Plan prepared in accordance with local, state, or federal regulations. A facility may have prepared a plan to address accidental discharges to the sanitary sewer or storm sewer. Facilities that have an industrial wastewater discharge to the City are often required to prepare an Accidental Spill Prevention Plan (ASPP).
- Facility-specific Operations and Maintenance Plans. Some facilities may have implemented quality systems such as ISO 9000 (Quality Manufacturing) or ISO 14001 (Environmental Management System). These international protocols typically will require the development of some form of Operations and Maintenance plans.

2.2 Requirements

Formation of a Pollution Prevention Team

- Assign one or more individuals to be responsible for onsite Hazardous Material or Fuel management. Hold periodic meetings to review the overall operation of the BMPs. Establish responsibilities for inspections, operation and maintenance, and availability for emergency situations. Provide training for all team members.

[Note: The formation of a Pollution Prevention Team must include at least one designated facility representative that is responsible for overall compliance with the GWPP Operational BMP requirements.]

General Housekeeping

- Promptly contain and clean-up all leaks and spills.
- Promptly repair or replace all cracked or damaged pavement or concrete that is located in areas used as secondary containment, and any other drainage areas which may be used to contain leaks or spills.
- Promptly repair or replace all leaking connections, pipes, hoses, valves, etc.

Preventive Maintenance

- Prevent the discharge of Hazardous Materials or Fuels to the ground, groundwater or surface water, to any storm drain inlet, or to any drainage ditch.
- Do not connect floor drains in potential Hazardous Material or Fuel source areas to storm drains, surface water, or to the ground.
- Construct impervious areas that are compatible with the materials handled. Portland cement concrete, asphalt, or equivalent materials may be considered. Materials such as asphalt may also need to be surfaced with a chemical resistant coating if Fuels are handled in that area.

Spill Prevention and Cleanup

- Upon discovery, IMMEDIATELY stop, contain, and clean-up all spills.
- Have spill containment and clean-up kits readily accessible.

- If a spill has reached or may reach a sanitary sewer or a storm drain, groundwater, or surface water at least one facility person is responsible for immediately notifying the appropriate authority.

Employee Training

- At least annually, provide training to all facility personnel that handle Hazardous Materials or Fuels.
- Annual training must include the basic elements and recordkeeping requirements defined in Section 3.9 of the Reference Manual.

2.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector may specifically inquire how the facility complies with the Operational BMPs. For example:

- Hazardous material storage, handling, and use areas will be visually inspected for evidence of cracked or deteriorated secondary containment systems, and the overall condition of the storage devices such as containers, totes, and tanks.
- In hazardous material storage or handling areas that rely on an impermeable, chemical resistant floor coating system, the area will be inspected for coating integrity. The facility may also be asked to furnish vendor-supplied coating or liner system specifications to demonstrate that the material is compatible and resistant to the regulated hazardous materials stored, handled, or used in that area. (See also Section 3.3.2 of the Reference Manual)
- If piping and pumps are used to transfer hazardous materials to use areas, those areas will be inspected for evidence of leaks, drips, or other signs of material loss.
- Examination of facility drawings or site plans, if available, or visual inspection of floor drains in hazardous material storage or handling areas, to verify they are not connected directly to storm drains, dry well sumps, the ground, or drain to surface water.
- All spill kits and other emergency response equipment will be visually inspected to determine if an adequate supply is present, the supplies are located in close proximity to locations where they may be needed in the event of a spill, and can be accessed easily.

[Note: It is the facility's responsibility to determine and justify what constitutes an *adequate* supply of spill response supplies and equipment. Criteria that should be considered are the volumes and types of hazardous materials handled, and proximity of storage and handling areas to potential discharge points such as storm drains, unpaved areas, drainage swales, etc.]

- Presence of written inspection logs or maintenance records that show hazardous material storage and handling areas are periodically inspected and maintained.
- Presence of written procedures (e.g., plans, signs, or posters) that provide instructions to facility personnel on how to respond in the event of a spill and how to notify responsible facility personnel.

- Presence of a written training log or other documentation that demonstrates annual employee training has been completed.

3.0 Indoor Hazardous Material Storage and Containment

3.1 Introduction

The main objectives of the GWPA are to protect groundwater by providing some form of secondary containment for regulated hazardous materials, preventing spills, and providing structural or operational BMPs to isolate any released materials before they get into surface water, soil, or groundwater. Adequate storage and secondary containment will aid in accomplishing the primary program goal of chemical release prevention.

Relevant sections of the Reference Manual that articulate the requirements for indoor storage and containment of regulated hazardous materials include:

3.3 - Indoor Storage Areas

3.8 - Storage, Maintenance and Repair of Vehicles and Equipment

As described below, secondary containment for the storage of regulated hazardous materials can be accomplished in a variety of ways. It is the responsibility of the facility to determine what method, or combination of methods will be used to satisfy the secondary containment requirements. *Structural Source Control BMPs* are physical, structural, or mechanical devices or facilities that are intended to prevent spills from entering stormwater or groundwater. Examples of indoor and outdoor Structural Source Control BMPs include:

- Enclosing or covering the Hazardous Material or Fuel source (e.g., within a building or other enclosure, a roof over storage and working areas, temporary tarp, etc.).
- Physically segregating the Hazardous Material or Fuel source to prevent run-on of uncontaminated stormwater.
- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area. Use a drip pan during liquid transfer

3.2 Requirements

Exempt Quantities

If the total quantity of an individual category of Hazardous Material stored or handled in a specific functional area (such as a maintenance area or work station) or indoor storage area does not exceed 25 percent of the facility quantity threshold for the material defined in Table 3, the secondary containment requirements described in this section are not applicable³. The exempt quantity threshold amounts for an individual storage area are:

- Halogenated Solvents – 2.5 gallons

³ For certain types of hazardous materials such as flammable liquids, the Oregon Fire Code may require approved secondary containment or storage in approved cabinets.

- Hazardous Substances – 12.5 gallons
- Hazardous Wastes – 7.5 gallons⁴
- Fuels – Greater than 50 gallons contained in any container or tank⁵

While not specifically required for the exempt quantities noted above, provision of secondary containment is *recommended* for all hazardous materials.

Secondary Containment

Section 3.3.1.1 and 3.3.2 of the Reference Manual provide the requirements for indoor storage of regulated hazardous materials, EXCEPT Fuels. Under Section 3.3.1.2 of the Manual, the indoor storage of fuels is exempt from the secondary containment requirements⁶.

The basic requirement for indoor storage of regulated hazardous materials is threefold:

1. Provide secondary containment for the storage of all regulated hazardous materials that exceed the facility quantity thresholds defined in Table 3.
2. All secondary containment devices must be constructed of impervious materials, or be coated with a chemical resistant coating (CRC) that is compatible with the hazardous material being stored and is capable of adhering to the surface being coated.
3. Any floor drain located near an indoor hazardous material storage area must either be sealed or removed, piped to the sanitary sewer (with appropriate shut-off valves AND with prior approval of the City), be blind sumps, or be directed to a containment or treatment system. IN MOST CASES, sealing or removing the drain will be the simplest solution.

Section 3.3.1.1 of the Reference Manual lists the requirements for provision of secondary containment.

Secondary containment areas/devices must provide a minimum of 110 percent of the volume of the largest container or tank, or 10 percent of the total volume stored at that location, whichever is greater.

For example, if four 55-gallon drums will be stored in a particular area, the secondary containment capacity is the greater of the following two calculations:

Volume of Largest Container or Tank (gal) x 1.1 = 55 gal x 1.1 = 60.5 gal, or

Total Volume Stored at Individual Location (gal) x 0.1 = (55 gal x 4) x 0.1 = 22 gal

60.5 gal > 22 gal, therefore a minimum of 60.5 gallons of secondary containment must be provided for that area.

⁴ Oregon's hazardous waste regulations (OAR 340-100 through 105) may require secondary containment for smaller amounts depending on the facility's generator or permit status.

⁵ Unless otherwise required by the Oregon Fire Code, secondary containment for Fuels is not required for INDOOR storage.

⁶ Indoor storage of fuel is regulated by the Oregon Fire Code, however. The exemption noted for the GWPP requirements in no way relieves a facility from complying with the City's Fire Code requirements.

Provided the Oregon Fire Code⁷ does not impose more specific secondary containment requirements for certain materials, secondary containment can be attained using portable devices, constructed containment, or a combination of the two. Both techniques are described here:

- **Portable Devices** - Prefabricated portable devices such as single or multiple drum containment vessels may be used if they have adequate capacity. See Figures 2 through 4 on the following pages for examples of both acceptable and inadequate types of portable secondary containment devices.

Regulated facilities are encouraged to use these types of secondary containment devices because (a) they are portable and can be moved as necessary, (b) they are relatively inexpensive when compared to building permanent types of secondary containment, (c) they provide “off-the-shelf” solutions to a wide variety of situations, and (d) are available from a number of suppliers.

Costs – Typical costs are provided on the figures. These costs are estimates only based on review of several manufacturers’ catalogs and should be used for budgetary purposes only. Costs shown do not include shipping.

⁷ For certain classes of hazardous materials, Section 2704.2 of the 2007 Oregon Fire Code may require additional containment capacity for projected fire flows originating from the fire suppression system. This applies only if the floor of the building or room where the hazardous materials are stored is being used as the secondary containment system. It does not apply to portable containment devices. Facilities should refer to the Oregon Fire Code to determine the specific containment requirements. [2014 Version] <https://www.oregon.gov/osp/SFM/Pages/2014ORFireCode.aspx>

Figure 2 - Examples of Acceptable Portable Secondary Containment for Small Containers



(a) Simple Pan Containment for Small Containers
(Typical cost: \$50-75)



(b) Containment Platforms for Containers Up To 30 Gallon Capacity
(Typical cost: \$100-200)



(c) Closable Storage Cabinets for Small Containers
(Typical cost: \$400-1,000)



(d) Rack Storage with Containment Built into Shelving
(Typical cost: \$600-800/rack)

Figure 3 - Examples of Acceptable Portable Secondary Containment for 55-Gallon Containers



(a) Single 55-Gallon Drum Containment with Optional Dolly
(Typical cost: \$100-200)



(b) Two and Four-Drum Containment Pallets with Lift-Truck Compatibility
(Typical cost: \$200-500)



(c) Two Drum Containment with Lift-Truck Compatibility
(Typical cost: \$200-300)



(d) Single and Four Drum Containment Unit that can be used on a Standard Pallet
(Typical cost: \$150-500)

Figure 3 - Examples of Acceptable Portable Secondary Containment for 55-Gallon Containers (continued)



(e) Four-Drum Containment Pallet Moveable with a Lift Truck
(Typical cost: \$250-500)



(f) Four-Drum Containment Platform with Hand Truck Ramp
(Typical cost: \$350-450)



(g) Four-Drum Containment Unit that Can Rest on Floor or be used with a Standard Pallet (Typical cost: \$150-200)



(h) **INADEQUATE** Secondary Containment Skid for 55-Gallon Drums
(Only has 32 gallons of Containment Capacity – 60 gallons Required)

Figure 4 - Examples of Acceptable Portable Secondary Containment for Intermediate Bulk Container (IBC) Totes and Tanks



(a) Containment Vessel for Standard IBC Tote Container
(Typical cost: \$700-1,200)



(b) Containment for Standard IBC Tote Container with Lift Truck Compatibility
(Typical cost: \$1,200-1,900)



(c) Containment for Small Tanks/Larger Containers
(Typical cost: \$200-500)



(d) Indoor or Outdoor Secondary Containment for Tanks up to 300-Gallon Capacity
(Typical cost: \$700-800)

- **Constructed Containment** – Depending on the type of operation and the volume of regulated hazardous materials to be stored indoors, the use of portable containment devices may not be practical or meet the needs of the facility. For non-portable devices such as fixed or mounted tank systems, it typically will be more practical to use a constructed containment system.

Constructed containment at existing or modified facilities can take on many forms and shapes. The most common installation is to use the building floor as the 'base' of the secondary containment, followed by the installation of cast-in-place or extruded concrete berms, or installing pre-manufactured 'cut-to-fit' synthetic or fiberglass berm materials to provide an enclosed containment area.

Access into container storage areas is usually provided by a roll-over berm with a crown width suitable for a hand truck or lift truck. The crown height must be set at a height that will meet the containment volume requirements below.

Access into larger tank storage areas is usually by ladder or steps because the required containment berm height will be too high to allow a roll-over berm.

Constructed containment systems at new facilities may also use the floor as the base of the containment, but the secondary containment volume typically is provided by recessed floor sumps, or recessed containment trenches/receptacles (this may not be practical for larger volume requirements such as fixed tank systems). A low-height perimeter berm is normally provided on one to three sides of the area to contain and direct released liquids into the containment system. Recessed containment is often constructed to eliminate safety and access issues created by roll-over berms because access into the area can be at floor level. The recessed containment system is usually open to the floor, but covered by a metal grate.

General Requirements. Any constructed containment system must meet the following requirements:

Containment Capacity – The containment capacity must equal 110 percent of the volume of the largest container or tank, or 10 percent of the aggregate liquid volume of hazardous materials to be stored, whichever is greater. If hazardous materials to be stored are also regulated by the Fire Code, additional containment capacity may be required to contain fire flows.

Floor and Sides –

1. The floor and sides (berms) of the containment area must be constructed of impervious materials that are compatible with the hazardous materials to be stored within the area.
2. If the floor and berms are constructed of concrete, all surfaces within the designated storage and containment area must be coated with a chemical resistant coating (CRC) system that is capable of sealing all surfaces, including concrete shrinkage and slab joint cracks⁸. CRC systems are typically a multi-component application that adheres to and seals the underlying concrete with the finished coating being resistant to attack from the chemicals stored in the area. Most CRCs that offer good chemical resistance are epoxy- or urethane-based. Prior to selection of

⁸ It is recommended that chemical resistant water stops be installed in concrete slab/pour joints.

any CRC, the product literature should be reviewed to assure that it will offer suitable protection against the hazardous materials that will be stored in the area. For example, CRC systems that offer good protection against acids often do not provide protection against organic solvents. The CRC must be installed in accordance with the manufacturer's instructions.

3. Alternatively, the area may be lined with a flexible membrane liner (FML) that is chemically compatible with the hazardous materials to be stored. FMLs must have a maximum permeability of 1×10^{-6} cm/sec⁹, and be installed to at least the height required to achieve the secondary containment capacity. All seams must be constructed in accordance with manufacturer specifications. FMLs do not offer significant abrasion or tear resistance and should not be used in any area that will have vehicular or other traffic.

3.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector will specifically inquire how the regulated facility complies with the indoor storage requirements. For example:

- Indoor hazardous material storage, handling, and use areas will be visually inspected for evidence of cracked, leaking, or deteriorated secondary containment systems, and the overall condition of the storage devices such as containers, totes, and tanks.
- For indoor hazardous material storage or handling areas that rely on an impermeable, chemical resistant floor coating system, the area will be inspected for coating integrity. The facility may also be asked to provide documentation from the vendor to demonstrate that the material is compatible and resistant to the regulated hazardous materials stored, handled, or used in that area. (See also Section 3.3.2 of the Reference Manual)
- If piping and pumps are used to transfer hazardous materials to use areas, those areas will be inspected for evidence of leaks, drips, or other signs of material loss.
- Examination of facility drawings or site plans, if available, or visual inspection of floor drains in hazardous material storage or handling areas, to verify they are not connected directly to storm drains, dry well sumps, the ground, or drain to surface water.
- All spill kits and other emergency response equipment will be visually inspected to determine if an adequate supply is present, the supplies are located in close proximity to locations where they may be needed in the event of a spill or release, and can be accessed easily.
- Presence of written inspection logs or maintenance records that show hazardous material storage and handling areas are periodically inspected and maintained.

⁹ See Section 3.3.2 of the Reference Manual.

- Presence of written procedures (e.g., plans, signs, or posters) that provide instructions to facility personnel on how to respond in the event of a spill and how to notify responsible facility personnel.

Figure 5 - Examples of Secondary Containment Using Chemical Resistant Coating Systems



(a) Tank Vessel Showing CRC Applied to Floor. Containment Berm not Shown in Photo.



(b) Tank System shown with Perimeter Containment Berm and CRC



(c) General Installation showing Containment Berm and CRC on Interior of Containment



(d) Floor of Tank Containment System without CRC showing Exposed Aggregate from Continued Chemical Exposure

Figure 6 - Examples of Secondary Containment Using Fabricated or Flexible Materials that also are Chemical Resistant Systems



(a) Tank with Raised Curb and Floor Containment System Constructed from Chemical Resistant Materials



(b) Larger View of System shown in (a)



(c) Chemically Resistant Flexible Liner System for an IBC Tote.



(d) Tank Secondary Containment Constructed with Flexible Liner System and External Support Framework.

4.0 Outdoor Hazardous Material Storage and Containment

4.1 Introduction

It is often not feasible or practical to store all Hazardous Materials indoors. The overall control approach for outdoor storage is to provide impervious secondary containment and to store the material under a roof or other form of cover.

Relevant sections of the Reference Manual that articulate the requirements for **outdoor** storage include:

3.5 – Outdoor Storage Areas

3.8 - Storage, Maintenance and Repair of Vehicles and Equipment

Provision of secondary containment and covers for the outdoor storage of regulated hazardous materials can be accomplished in a variety of ways. It is the responsibility of the facility to determine what method, or combination of methods will be used to satisfy the GWPP requirements.

Section 3.5 of the Reference Manual applies to the storage of containers, tanks, and bulk solid materials. It applies to Hazardous Materials and Fuels.

4.2 Requirements

Exempt Quantities

If the total quantity of an individual category of Hazardous Material stored or handled in an outdoor functional area (such as a maintenance area or work station) or storage area does not exceed 25 percent of the facility quantity threshold for the material defined in Table 3, the secondary containment requirements described in this section are not applicable. The exempt quantity threshold amounts for an individual storage area are:

- Halogenated Solvents – 2.5 gallons
- Hazardous Substances – 12.5 gallons
- Hazardous Wastes – 7.5 gallons¹⁰
- Fuels – Greater than 50 gallons contained in any container or tank

While not specifically required for the exempt quantities noted above, provision of secondary containment is *recommended* for all hazardous materials.

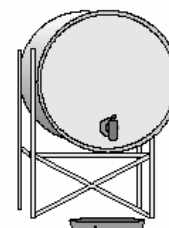
¹⁰ Oregon's hazardous waste regulations (OAR 340-100 through 105) may require secondary containment for smaller amounts depending on the facility's generator or permit status.

Outdoor Container Storage

Operational BMPs

Required Operational BMPs are defined in Section 3.5.1.1.1 of the Reference Manual:

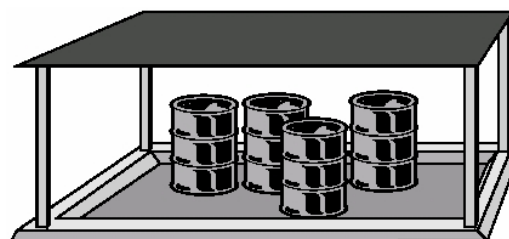
- Place tight-fitting lids on all containers. The lids should be securely closed except when adding or removing materials from the container.
- Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
- Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers *daily* for leaks/spills. Replace containers, and replace and tighten bungs in drums as needed.
- Hazardous Materials that do not contain any liquids may be stored in a sloped designated area with the containers elevated or otherwise protected from stormwater run-on.
- Drums stored in an area where unauthorized persons may gain access must be secured in a manner that prevents accidental spillage, pilferage, or any unauthorized use.
- Storage of reactive, ignitable, or flammable liquids must comply with the Fire Code.



Structural BMPs

Required Structural BMPs are defined in Section 3.5.1.1.1 of the Reference Manual:

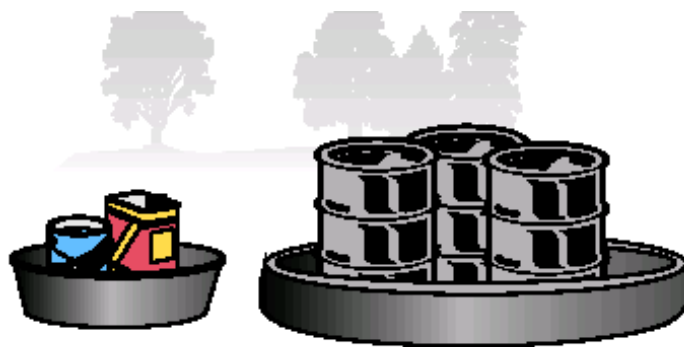
- Keep containers of Hazardous Materials liquids inside a building unless this is impracticable due to site constraints or Fire Code requirements.
- Store containers in a designated area, which is covered, bermed or diked, paved and impervious in order to contain leaks and spills. The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.



[Note: Covered storage areas are not required if the facility meets the Additional Requirements in Section 3.5.2 of the Reference Manual for managing accumulated stormwater.]

- For liquid Hazardous Materials, surround the containers with a dike as illustrated in diagram above. The dike must be of sufficient height to provide a volume of either 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater, or, if a single container, 110 percent of the volume of that container.

- Where material is temporarily stored in drums, a containment system can be used as illustrated, in lieu of the above system. See diagram to the right.
- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer. (See section 3.5.1 in Reference Manual.)



Secondary Containment

Section 3.5.1.1.1 of the Reference Manual lists the requirements for provision of secondary containment. Permanent (i.e., constructed) or portable devices may be used to satisfy the requirements to provide secondary containment. Portable devices can be very cost-effective for smaller inventories of containers.

Covered Outdoor Storage. The containment requirement for covered outdoor storage is to provide a minimum of 110 percent of volume of the largest container of hazardous material being stored, or 10 percent of the total volume being stored at that individual storage location, whichever is greater. For example, if a pallet of four 55-gallon drums will be stored in a covered outdoor storage area, the required secondary containment capacity is the greater of the following two calculations:

Volume of Largest Container or Tank (gal) x 1.1 = 55 gal x 1.1 = 60.5 gal, or

Total Volume Stored at Individual Location (gal) x 0.1 = (55 gal x 4) x 0.1 = 22 gal

60.5 gal > 22 gal, therefore a minimum of 60.5 gallons of secondary containment must be provided for that area

Uncovered Outdoor Storage. If the storage area will be uncovered, additional containment capacity provisions should be made for rainfall accumulation inside the secondary containment system. The 'general rule of thumb' for the Portland area is to provide additional containment capacity for a 25-year, 24-hour recurrence interval storm event (3.9 inches or 0.33 feet).

For example, if an *uncovered*, outdoor area will be used for storage containers containing regulated hazardous materials, the secondary containment requirements would be the volume required for the containers *and* the volume required for accumulated precipitation. Assuming twenty 55-gallon drums will be stored in a 15 ft x 15 ft area (225 square feet) in an uncovered outdoor storage area, the secondary containment capacity is the greater of the following two calculations:

Volume of Largest Container or Tank (gal) x 1.1 = 55 gal x 1.1 = 60.5 gal, or

Total Volume Stored at Location (gal) x 0.1 = (55 gal x 20) x 0.1 = 110 gal

110 gal > 60.5 gal, therefore a minimum of 110 gallons of secondary containment must be provided for containment of the hazardous materials, *but capacity for contaminated stormwater must also be added*:

Volume of accumulated rainfall = 0.33 ft x 225 sq ft = 63 cubic feet x 7.48 gal/cubic foot = 547 gallons.

TOTAL Required Secondary Containment Volume = 110 gallons + 547 gallons = 657 gallons

Note Regarding Managing Accumulated Water in Uncovered Storage Areas: See Section 3.5.2 of the Reference Manual. Water will accumulate in uncovered storage areas during and after rain. Any *contaminated* water cannot simply be drained from the area. It must be collected, inspected, and possibly tested before proper disposal can be determined.

In uncovered storage areas, a blind sump, quick-closing valve, or other shut-off device that is capable of isolating the storage area shall be installed on the drain line in the storage area so excess stormwater can be transferred or drained out of the storage area and directed either to the storm drainage facilities (*if clean*) or into the City sanitary sewer, or authorized pretreatment facility (*if contaminated*).

Except when excess stormwater is being discharged, any installed valves shall be kept closed.

All discharges to the sanitary sewer shall be considered batch discharges and shall require approval by the City and possible pretreatment prior to discharge. Pretreatment requirements will be set as part of the discharge approval process, based on the types and quantities of material to be discharged. A discharge evaluation shall be performed before connection or discharge to a sanitary sewer. Testing may be required to establish characteristics of the wastewater or contaminated stormwater and to verify that local discharge limits are not exceeded and determine if pretreatment is needed.

Signage

The following language shall be provided at the above-ground storage area for liquid materials that is plainly visible and water resistant, and include the following information:

- Safety precautions
- Immediate spill response procedures
- Emergency contacts and telephone numbers

Portable Devices - Prefabricated portable devices such as single or multiple drum containment vessels may be used for outdoor storage of containers. Limited prefabricated options are available for tanks; typically, a double-walled tank installation would be preferred. See Figure 7 for examples of acceptable types of portable secondary containment devices.

Regulated facilities are encouraged to use these types of secondary containment devices because (a) they are portable and can be moved as necessary, (b) they are relatively inexpensive when compared to building permanent types of secondary

containment, (c) they provide “off-the-shelf” solutions to a wide variety of situations, and (d) are available from a number of suppliers.

Costs – Typical costs are provided on the figures. These costs are estimates only based on review of several manufacturers’ catalogs and should be used for budgetary purposes only. Costs shown do not include shipping.

Tank Storage

Hazardous Materials Control approach

Install secondary containment or a double-walled tank. Slope the containment area to a drain with a sump. Stormwater collected in the containment area may need to be discharged to treatment such as an API or CP oil/water separator, or equivalent BMP. Add safeguards against accidental releases including protective guards around tanks to protect against vehicle or forklift damage, and tagging valves to reduce human error. *Tank water and condensate discharges are process wastewater that may need an NPDES Permit issued by the City or the Oregon Department of Environmental Quality.*

Operational BMPs

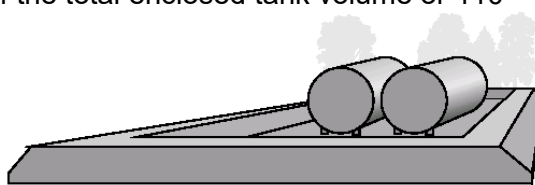
Required Operational BMPs are defined in Section 3.5.1.1.2 of the Reference Manual:

- Inspect the tank containment areas regularly to identify problem components such as fittings, pipe connections, and valves, for leaks/spills, cracks, corrosion, etc.
- Place adequately sized drip pans beneath all mounted taps and drip/spill locations during filling/unloading of tanks. Valved drain tubing may be needed in mounted drip pans.
- Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
- All installations shall comply with the Fire Code and the National Electric Code.

Structural BMPs

Required Structural BMPs are defined in Section 3.5.1.1.2 of the Reference Manual:

- Locate permanent tanks in impervious secondary containment surrounded by dikes, or UL Approved double-walled. The dike must be of sufficient height to provide a containment volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank, whichever is greater, or, if a single tank, 110 percent of the volume of that tank.
- Slope the secondary containment to drain to a dead-end sump (optional), or equivalent, for the collection of small spills.
- Include a tank overfill protection system to minimize the risk of spillage during loading.



Secondary Containment

Section 3.5.1.1.2 of the Reference Manual lists the requirements for provision of secondary containment. Permanent (i.e., constructed) or portable devices may be used to satisfy the requirements to provide secondary containment. Portable or prefabricated devices can be very cost-effective for smaller tanks (under 500 gallons) when compared to the permitting, construction, and maintenance costs associated with a permanent structural solution. Limited prefabricated solutions are available for larger tanks aside from double-walled tanks that have integrated secondary containment.

Covered Outdoor Storage. If the tank storage area is covered, the requirement is to provide a minimum of 110 percent of volume of the largest tank of hazardous material being stored, or 10 percent of the total volume being stored if multiple tanks are located within an individual functional area, whichever is greater.

Uncovered Outdoor Storage. If the tank storage area will be uncovered, additional containment capacity provisions should be made for precipitation that can fall and accumulate inside the secondary containment system. The 'general rule of thumb' for the Portland area is to provide additional containment capacity for a 25-year, 24-hour recurrence interval storm event (3.9 inches or 0.33 feet).

To the extent practicable, all taps, couplings, pumps, and other potential drip, spill, and leak-prone spots (during liquid transfer operations, and when making and breaking connections) that are not located inside a secondary containment system shall be covered with rain shields. Drip pans shall be placed under the rain shields. Any materials collected in the drip pans and any soiled absorbent materials shall be reused, recycled, or appropriately disposed.

Double-Walled Tank Systems. Properly installed and maintained double-walled tank systems are deemed to meet the secondary containment requirement, PROVIDED that areas with exposed dispensing hoses or fixtures associated with double-walled tank systems are equipped with some form of containment. Containment shall be provided through a quick-closing valve, other shut-off device, or other methods (such as drain covers, diking material, sorbent booms, etc.) to isolate spilled materials within the conveyance system that handles runoff, or by containing the spilled material prior to reaching the conveyance system.

Signage

Facilities are required to provide signage similar to that shown below that is plainly visible from all material transfer activity areas. Signage shall be provided at outdoor storage area(s) that is plainly visible and water resistant, and shall include the following information:

- Safety precautions
- Immediate spill response procedures
- Life safety or fire emergency, dial 911
- Emergency contacts and telephone numbers - Report spills of reportable quantities to the Oregon Emergency Response System at 800-452-0311 and the appropriate local City spill responder:
 - In Portland: 503-823-7180
 - In Fairview & Gresham: 503-823-3333

- The Columbia Corridor Association (CCA), in cooperation with the Portland Water Bureau, has generic signage available at no charge to GWPA businesses. Contact CCA at 503-287-8686. Signs vary slightly depending on whether the facility is located in Portland, Gresham, or Fairview.

4.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector will specifically inquire how the regulated facility complies with the requirements for outdoor storage. For example:


- Outdoor hazardous material storage, handling, and use areas will be visually inspected for evidence of cracked, leaking, or deteriorated secondary containment systems, and the overall condition of the storage devices such as containers, totes, and tanks.
- If the facility has uncovered outdoor storage areas for tanks or containers, it will be asked to furnish documentation regarding the adequacy of the secondary containment system capacity. If water is discharged from the containment area, review of water handling procedures will be examined such as:
 - If water is discharged to the storm drain system, are records of inspections or testing available to document that the water discharged to the storm drain system was *uncontaminated*?
 - If accumulated water is discharged to the sanitary sewer system, does the facility have batch authorization from the City? Is testing performed to assure compliance with the discharge requirements?
- If piping and pumps are used to transfer hazardous materials to use areas, those areas will be inspected for evidence of leaks, drips, or other signs of material loss.
- Examination of facility drawings, if available, or visual inspection of sumps or drains in outdoor hazardous material storage, handling, or use areas, to verify they are not connected directly to storm drains, dry well sumps, the ground, or drain to surface water.
- All spill kits and other emergency response equipment will be visually inspected to determine if an adequate supply is present, the supplies are located in close proximity to locations where they may be needed in the event of a spill or release, and can be accessed easily.

IN THE EVENT OF A SPILL


1. Cover and isolate nearby drains
or turn off drain valve located at _____
2. Call the supervisor _____
3. If a spill reaches a drain, water or soil, call **503-823-7180** anytime.
For Police, Fire or Medical Emergencies call 911

If you are cleaning up a spill:

- Wear protective gear
- Keep unauthorized vehicles and people out of spill
- Use the spill kit:
 - Seal off drains
 - Set up a berm to contain the spill
 - Cleanup with absorbent materials



GROUNDWATER
PROTECTION PROGRAM
COLUMBIA SOUTH SHORE



HELP PROTECT DRINKING WATER. You are standing over
Portland's Columbia South Shore Well Field - a regional drinking
water source from groundwater.

Chemical Transfer Procedures

Refer to the unloading procedures located _____

[Note: It is the facility's responsibility to determine and justify what constitutes an *adequate* supply of spill response supplies and equipment. Criteria that should be considered are the volumes and types of hazardous materials handled, and the proximity of storage and handling areas to storm drain inlets, unpaved areas, drainage swales, etc.]

- Presence of written inspection logs or maintenance records that show hazardous material storage and handling areas are periodically inspected and maintained.
- Presence of written procedures (e.g., plans, signs, or posters) that provide instructions to facility personnel on how to respond in the event of a spill and how to notify responsible facility personnel.
- Presence of adequate signage that provides information or instructions to facility personnel on how to respond in the event of a spill or release of regulated hazardous materials and how notify responsible facility personnel.

Figure 7 - Examples of Acceptable Portable Outdoor Secondary Containment Containers



(a) Portable Containment for Two 55-Gallon Containers
(Typical cost: \$1,000-1,200)



(b) Portable Containment for Two or Four 55-Gallon Containers
(Typical cost: \$1,000-1,500)



(c) Portable Containment for up to Four 55-Gallon Containers
(Typical cost: \$1,000-2,000)



(d) Portable Welded Steel Storage and Containment for up to Four 55-Gallon Containers
(Typical cost: \$2,000-3,000)

5.0 Intra-Site Transfer Areas

5.1 Introduction

Relevant sections of the Reference Manual that articulate the requirements for Intra-Site Transfer Areas include:

3.4 – Loading and Unloading Areas

3.4.2 – Additional Requirements

As defined in Section 3.2 of the Reference Manual, “Intra-Site Transfer Areas” are:

- Any areas located within a site that are used for transferring Hazardous Materials or Fuels to/from mobile storage devices (such as portable tanks, tanker trucks, or vacuum trucks) to/from processing equipment reservoirs or to other storage devices.
- Intra-site transfer areas do not include areas used for fueling vehicles with mobile fueling/service rigs.

[Note: Intra-site transfer areas also do not include the transportation routes between the source and receiving locations – these would be regulated under Section 3.6 – Transportation Routes (or Access Roads) of the Reference Manual.]

Intra-site transfer areas can be any location, permanent or temporary, where regulated Hazardous Materials are transferred between two or more points onsite. That is, Hazardous Materials that are already located onsite are transferred or moved to some other location onsite. Examples might include:

- Use of a mobile tanker or trailer-mounted tank to transfer a regulated liquid from a bulk storage tank to the reservoir of a piece of manufacturing equipment. (A good example, though the oil would not be specifically regulated by the GWPP, would be the transfer of hydraulic oil from an onsite bulk storage tank to the reservoir on a hydraulic press located in another area of the facility.)
- Removal of a waste regulated liquid from a piece of equipment and transfer to an onsite storage tank until the liquid can be transferred to an offsite treatment/recycling facility.

The “Intra-Site Transfer area” is anywhere where the transfer operation occurs. Typically, it will involve the transfer of bulk materials at or near the bulk storage location (transfer into the portable device) and at or near the receiving location (transfer from the portable device).

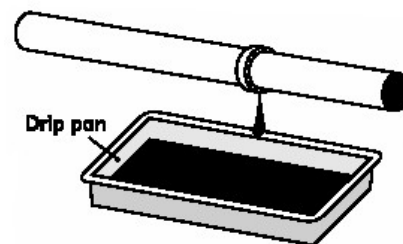
5.2 Requirements

Section 3.4 – Loading and Unloading Areas of the Reference Manual applies to “Intra-Site Transfer Areas.”

The Hazardous Materials control approach for Intra-site transfer areas is to cover OR contain the loading/unloading area where necessary to prevent run-on of uncontaminated stormwater and runoff of contaminated stormwater.

Required Operational BMPs

See Section 3.4.1.1.1 of the Reference Manual. Place drip pans, or other appropriate temporary containment device, at locations where leaks or spills may occur such as hose connections, hose reels and filler nozzles. Drip pans must always be used when making and breaking connections. Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.



Required Structural BMPs

See Section 3.4.1.1.2 of the Reference Manual. The highest preference is to have the intra-site transfer area inside a building or under a cover (e.g., a building awning). For some facilities that may not be a practicable solution, given that intra-site transfer operations may be temporary or mobile types of activities.

If the intra-site transfer does not meet the structural requirements contained in Section 3.4.1.1.2 of the Manual, the following requirements apply:

Paved Surfaces and Spill Containment

See Section 3.1.4 of the Reference Manual.

The intra-site transfer area must be located on a paved or concrete surface where Hazardous Material loading and unloading activities will be conducted.

As shown in Figure 8, if drainage from a loading or unloading area can enter a stormwater conveyance system, the area must be equipped with drain covers, absorbent booms, diking material sufficient to isolate spilled material, or a quick-closing valve and proper signage (see below). In the event of a spill or release during a transfer operation, the spill containment equipment must be readily accessible. If the area is equipped with spill isolation valves or drain covers, it is recommended that the valves be closed or drain covers installed during transfer operations.

Spill Containment Inspection Required

If drainage from an intra-site transfer loading or unloading area can enter a stormwater system in the immediate proximity¹¹ where Hazardous Material loading and unloading operations are performed, the facility must arrange for an inspection by the City to document that required transfer procedures are in place and that required spill containment devices, if applicable, are installed and function adequately to isolate the storm drain inlet(s).

¹¹ Professional judgment must be used to define 'immediate proximity' for an individual intra-site transfer area. If the typical volume of Hazardous Materials is very small (e.g., less than 50 gallons), 'immediate proximity' may be less than 25 feet away from the transfer area, depending on the site-specific nature of the area, and the ability to respond and isolate the drain system in the event of a spill. If larger volumes will be transferred, then the 'immediate proximity' distance will likely increase.

Signage

Facilities are required to provide signage similar to that shown in all material transfer activity areas. Signage shall be provided at the intra-site transfer area that is plainly visible and water resistant, and shall include the following information:


- Transfer procedures (i.e., instructions for operation – the instruction may also refer to a location onsite where detailed instructions are located)
- Safety precautions
- Immediate spill response procedures
- Life safety or fire emergency, dial 911
- Report spills of reportable quantities to the Oregon Emergency Response System at 800-452-0311 and the appropriate local City spill responder:
 - In Portland: 503-823-7180
 - In Fairview & Gresham: 503-823-3333


IN THE EVENT OF A SPILL

1. Cover and isolate nearby drains or turn off drain valve located at _____
2. Call the supervisor _____
3. If a spill reaches a drain, water or soil, call **503-823-7180** anytime.
For Police, Fire or Medical Emergencies call 911

If you are cleaning up a spill:

- **Wear protective gear**
- **Keep unauthorized vehicles and people out of spill**
- **Use the spill kit:**
 - Seal off drains
 - Set up a berm to contain the spill
 - Cleanup with absorbent materials





HELP PROTECT DRINKING WATER. You are standing over Portland's Columbia South Shore Well Field - a regional drinking water source from groundwater.

Chemical Transfer Procedures

Refer to the unloading procedures located _____

The Columbia Corridor Association (CCA), in cooperation with the City of Portland Water Bureau, has generic signage available at no charge to GWPA businesses. Contact CCA at 503-287-8686. Signs vary slightly depending on whether the facility is located in Portland, Gresham, or Fairview.

5.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector will specifically inquire how the regulated facility complies with the Intra-Site Transfer Area requirements, if applicable. For example:

- The Intra-Site Transfer Area(s) will be visually inspected for evidence of cracked or deteriorated asphalt or concrete paving, and the overall condition transfer area paved surfaces and drainage pattern.
- All spill kits and other emergency response supplies or equipment will be visually inspected to determine if an adequate supply is present, and the supplies are located in close proximity to the Intra-Site Transfer Area(s), and that they can be accessed easily.

[Note: It is the facility's responsibility to determine and justify what constitutes an *adequate* supply of spill response supplies and equipment. Criteria that should be considered are the volumes and types of hazardous materials handled, and proximity of storage and handling areas to vulnerable facility areas such as storm drain inlets, unpaved areas, drainage swales, etc.]

- Presence or absence of written inspection logs or maintenance records that document Intra-Site Transfer Areas are periodically inspected to document that preventative maintenance is being performed.
- Presence or absence of written Hazardous Material transfer procedures or other instructions to facility personnel on how to respond in the event of a spill or release of regulated hazardous materials and how to notify responsible facility personnel.
- General knowledge and awareness of transfer and emergency response procedures for facility personnel who are responsible for operating/using Intra-Site Transfer Areas.
- Presence of adequate signage.

Figure 8 - Examples of Devices that can be Used for Spill Containment at Intra-Site Transfer Areas



(a) Flexible Plastic Drain Covers can be Used to Isolate Drain Inlets.



(b) Flexible Dike Materials can be Used to Isolate Drain Inlets.



(c) Spill Control Shut-off Valve Installed on Storm Drain System.



(d) Prefabricated Catch Basin Inserts ("Safe-Drains") with Butterfly Valve that can be Quickly Closed in Event of Spill and During Transfer Operations.

6.0 Loading and Unloading Areas

6.1 Introduction

Relevant sections of the Reference Manual that articulate the requirements for Loading and Unloading Areas include:

- 3.4 – Loading and Unloading Areas
- 3.6 – Transportation Routes (Or Access Roads)

As defined in Section 3.2 of the Reference Manual, “Loading/Unloading Areas” are any areas that:

- Are designed (size, width, etc.) to accommodate truck/trailer loading or unloading activities. Loading/unloading may occur at loading/unloading docks, bay doors, and any other building access point(s) that will accommodate a truck/trailer being backed up to, or into it; and
- are expected to be used specifically to receive or load Hazardous Materials to/from trucks or trailers.
- Loading/unloading areas may also receive or load Hazardous Materials to/from rail cars and tanker trucks.

6.2 Requirements

The following additional requirements apply to facilities with Hazardous Material loading and unloading areas, including intra-site transfer areas.

[Advisory Note: New, reconstructed, and significantly modified facilities located within the City of Portland might also be subject the requirements of the *Stormwater Management Manual* and the *Source Control Manual*, published by the City of Portland Bureau of Environmental Services. Facilities should check those documents to determine potential applicability requirements.]

The primary Hazardous Materials control approach for loading and unloading areas is to cover or contain the loading/unloading area to:

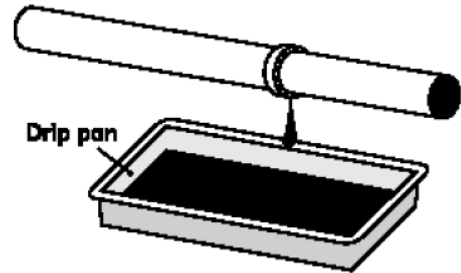
- Prevent storm water run-on into the area,
- Minimize the potential for spills during loading/unloading activities, and
- Prevent the runoff of contaminated storm water.

Operational BMPs

Required Operational BMPs are defined in Section 3.4.1.1.1 of the Reference Manual.

All Loading/Unloading Areas

- Use drip pans or other containment devices at all locations where leaks or spills may occur. Use drip pans under hose connections, hose reels, filler nozzles, and other locations.
- Always use a drip pan when making and breaking hose connections.
- Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.



Tanker Truck and Rail Transfer Areas to Storage Tanks

- See Section 3.4.1.1.1 of the Reference Manual.

Structural BMPs

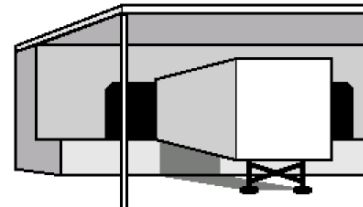
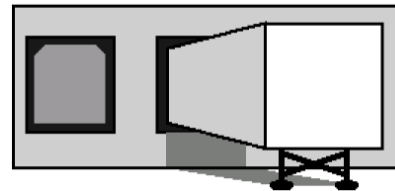
Required Structural BMPs are defined in Section 3.4.1.1.2 of the Reference Manual.

All Loading/ Unloading Areas

- If possible, conduct unloading or loading inside a building, under a roof, under a lean-to, or other covered area.
- Berm, dike, or slope the loading/unloading area to prevent run-on of stormwater into the area and to prevent runoff (or spilled material) from leaving the area.
- Pave and slope loading/unloading areas to prevent the pooling of water.
- Minimize the use of catch basins and drain lines within the interior of the paved area as they will frequently be covered by vehicles, equipment, or material (e.g., containers). Catch basins should be placed in designated areas that are not covered by material, containers or equipment.

Loading and Unloading Docks

- Install and maintain overhangs, or door skirts that enclose the trailer end to prevent contact with rainwater.
- Design the loading/unloading area with berms, or slope the ground to prevent the run-on of stormwater.
- Retain on-site the necessary materials for rapid cleanup of spills.



Tanker Truck Transfer Areas

- Pave the area where transfers occur. If any transferred liquid, such as gasoline, is reactive with asphalt, pave the area with Portland cement concrete. Alternatively, install a chemical resistant pavement coating on the asphalt.

- Slope, berm, or dike the transfer area to a dead-end sump, spill containment sump, a spill control (SC) oil/water separator, or other spill control device. See Section 3.4.1.1.2 of the Reference Manual for specific containment requirements.

Paved Surfaces and Spill Containment

If the loading/unloading area does not meet the structural requirements summarized above, as required in Section 3.4.2 of the Manual, the following requirements apply:

- The loading/unloading area must be located on a paved or concrete surface around the area where Hazardous Material loading and unloading activities will be conducted.
- As shown in Figure 8, if drainage from a loading or unloading area can enter a stormwater conveyance system, the area must be equipped drain covers, absorbent booms, diking material sufficient to isolate spilled material, or a quick-closing valve and proper signage (see below). In the event of a spill or release during a transfer operation, the spill containment equipment must be readily accessible. If the area is equipped with spill isolation valves or drain covers, it is recommended that the valves be closed or drain covers installed during transfer operations.

Spill Containment Inspection Required

If drainage from a loading or unloading area can enter a stormwater system in the immediate proximity¹² where Hazardous Material loading and unloading operations are performed, the facility must arrange for an inspection by the City to confirm that required transfer procedures are in place and that required spill containment devices, if applicable, are installed and function adequately to isolate the storm drain inlet(s). This inspection, if not performed during a routine inspection by the City, may have a fee assessed pursuant to the Schedule of Fees established by the City.

¹² Professional judgment must be used to define 'immediate proximity' for a loading/unloading area. If the typical volume of Hazardous Materials is very small (.e.g., less than 50 gallons), 'immediate proximity' may be less than 25 feet away from the transfer area, depending on the site-specific nature of the area, and the ability to respond and isolate the drain system in the event of a spill. If larger volumes will be transferred, then the 'immediate proximity' distance will likely increase.

Signage

Facilities are required to provide signage similar to that shown that is plainly visible from all material transfer activity areas. Signage shall be provided at the loading/unloading area that is plainly visible and water resistant, and shall include the following information:


- Transfer procedures (i.e., instructions for operation – the instruction may also refer to a location onsite where detailed instructions are located)
- Safety precautions
- Immediate spill response procedures
- Life safety or fire emergency, dial 911
- Emergency contacts and telephone numbers – In addition to an internal telephone number, the sign should also have one of the following external telephone numbers depending on which city the facility is located;
 - City of Portland – Environmental Services Emergency Spill Response, dial 503-823-7180
 - City of Gresham/Fairview – dial 503-823-3333

IN THE EVENT OF A SPILL


1. Cover and isolate nearby drains or turn off drain valve located at _____
2. Call the supervisor _____
3. If a spill reaches a drain, water or soil, call **503-823-7180** anytime.
For Police , Fire or Medical Emergencies call 911

If you are cleaning up a spill:

- **Wear protective gear**
- **Keep unauthorized vehicles and people out of spill**
- **Use the spill kit:**
 - Seal off drains
 - Set up a berm to contain the spill
 - Cleanup with absorbent materials



GROUNDWATER
PROTECTION PROGRAM
ESTABLISHED 1990



HELP PROTECT DRINKING WATER: You are standing over Portland's Columbia South Shore Well Field - a regional drinking water source from groundwater.
Portland Water Bureau

Chemical Transfer Procedures
Refer to the unloading procedures located _____

The Columbia Corridor Association (CCA), in cooperation with the Portland Water Bureau, has generic signage available at no charge to GWPA businesses. Contact CCA at 503-287-8686. Signs vary slightly depending on whether the facility is located in Portland, Gresham, or Fairview.

6.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector will specifically inquire how the regulated facility complies with the Loading/Unloading Area requirements, if applicable. For example:

- Loading/unloading area(s) will be visually inspected for evidence of cracked or deteriorated asphalt or concrete paving, and the overall condition transfer area paved surfaces and drainage pattern.
- All spill kits and other emergency response supplies or equipment will be visually inspected to determine if an adequate supply is present, and the supplies are located in close proximity to the loading/unloading area, and that they can be accessed easily.

[Note: It is the facility's responsibility to determine and justify what constitutes an *adequate* supply of spill response supplies and equipment. Criteria that should be

considered are the volumes and types of hazardous materials handled, and proximity of storage and handling areas to vulnerable facility areas such as storm drain inlets, unpaved areas, drainage swales, etc.]

- Presence or absence of written inspection logs or maintenance records that document loading/unloading areas are periodically inspected to document that preventative maintenance is being performed.
- Presence or absence of written Hazardous Material transfer procedures or other instructions to facility personnel on how to respond in the event of a spill or release of regulated hazardous materials and how to notify responsible facility personnel.
- General knowledge and awareness of transfer and emergency response procedures for facility personnel who are responsible for operating/using loading/unloading area.
- Presence of adequate signage.

7.0 Storage, Maintenance, and Repair of Vehicles and Equipment

7.1 Introduction

Relevant sections of the Reference Manual that articulate the requirements for owners or operators who are engaged in the storage, maintenance, and repair of vehicles and equipment include:

- 1.4.4)(b)(ii) and (iii) – Exempt Uses and Materials
- 3.6.1 – Transportation Routes – General Requirements
- 3.8 – Storage, Maintenance, and Repairs of Vehicles and Equipment
- 5.1 – Hazardous Material Inventory Report

As defined in Section 1.4.4)(a) of the Reference Manual, Hazardous Materials contained in fuel tanks and fluid reservoirs such as coolants, oils, hydraulic or braking fluids that are permanently attached to private or commercial vehicles, machinery, and aircraft, and are components of the operation of that equipment are EXEMPT from regulation. HOWEVER, Section 1.4.4)(b) defines several exceptions to this general exemption. Uses or materials that are NOT exempt include:

- Hazardous Materials or Fuels that are considered freight or cargo,
- Hazardous Materials or Fuels that are contained in vehicles, trucks, or other equipment at facilities engaged in the sale, resale, leasing, or rental of automobiles, trucks, or other equipment, and
- Hazardous Materials or Fuels that are contained in un-drained fuel tanks or other un-drained fluid reservoirs on vehicles or equipment that are received at facilities engaged in the dismantling, salvaging, or scrapping of those vehicles or equipment.

Therefore, this Section addresses establishments such as new/used auto, truck, and equipment sales, rental, service, and leasing firms, and firms such as auto salvage yards, wrecking yards, vehicle and equipment parts yards, and other types of operations that dismantle, salvage, or scrap vehicles or equipment.

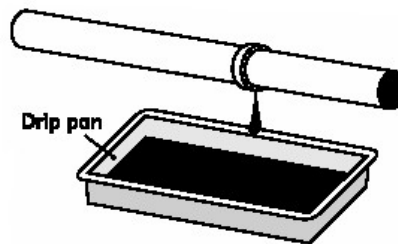
7.2 Requirements

The primary Hazardous Materials control approach for activities covered by this Section is to minimize the potential for leaks and spills of fluids by using good housekeeping practices, and by following BMPs that include cover and containment provisions.

Operational BMPs

Required Operational BMPs are defined in Section 3.8.1.2 and 3.1.4 of the Reference Manual and include:

- Inspect all incoming vehicles, parts, and equipment for leaks that will be stored outside, even if only temporarily.
- Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid containing parts or removal or transfer of liquids.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination (e.g., in a building or under an awning). Store cracked batteries in a covered non-leaking secondary containment system.
- Properly drain oil and fuel filters before disposal or recovery as scrap metal. Provide for proper disposal of waste oil and fuel. See 40 CFR Part 279 for the federal and state requirements regarding the proper collection and management of used oil, and used oil filters.
- Do not pour washwater, liquid waste, or other Hazardous Materials into storm drains or to surface water. Check with your local sanitary sewer authority for approval prior to discharging washwater into a sanitary sewer.
- Do not connect maintenance and repair shop floor drains to storm drains or to surface water. If they are connected now, properly disconnect them.
- If washing of a parking lot is conducted, discharge the washwater to a sanitary sewer, if allowed by the City, or other approved wastewater treatment system, or collect it for off-site disposal. Do not allow the discharge to the storm drains or to runoff into unsurfaced areas.
- Do not hose down the area to a storm drain or to surface water. Sweep parking lots, storage areas, and driveways, regularly to collect dirt, waste, and debris.



Structural BMPs

See Section 3.8.1.3 of the Reference Manual for the structural requirements for performing non-exempt onsite maintenance and repair of vehicles and equipment. The requirements include:

- Conducting all maintenance and repair of vehicles and equipment in a building, or other covered impervious containment area that is sloped to prevent run-on of uncontaminated stormwater into the maintenance area and runoff of contaminated stormwater.
- The maintenance of refrigeration engines in refrigerated trailers may be conducted in the parking area with due caution to avoid the release of engine or refrigeration fluids to storm drains or surface water.
- Park large mobile equipment such as cranes, excavators, log stackers, etc., that are prone to fluid leaks, in a designated contained area.

7.3 What to Expect During an Inspection

During periodic compliance inspections by the City, the Gresham or Portland Inspector will specifically inquire how the regulated facility complies with the requirements, if applicable. For example:

- Vehicle/equipment receiving, processing, and storage areas will be visually inspected for evidence of cracked or deteriorated asphalt or concrete paving, and evidence of ongoing or past leaks onto the ground. Unpaved areas where vehicles or equipment are stored will be carefully checked for visual evidence of ongoing or past leaks to the ground (e.g., are oil stains present on the ground beneath or near stored vehicles).
- All spill kits and other emergency response supplies or equipment will be visually inspected to determine if an adequate supply is present, and the supplies are located in close proximity to areas most vulnerable to spills, and that they can be accessed easily.

[Note: It is the facility's responsibility to determine and justify what constitutes an *adequate* supply of spill response supplies and equipment. Criteria that should be considered are the volumes and types of hazardous materials handled, and proximity of storage and handling areas to vulnerable facility areas such as storm drain inlets, unpaved areas, drainage swales, etc.]

- Presence or absence of written inspection logs or maintenance records that documents vehicles or equipment are checked for fluid leaks before being placed in storage prior to repair or salvaging.
- Maintenance areas will be inspected to determine if they are under cover or are isolated from stormwater collection systems.
- Used oil and filters, antifreeze, and other waste fluid collection areas will be inspected for proper secondary containment, as necessary, and will be visually examined for proper housekeeping procedures (i.e., are drips and spills promptly collected, is the area tidy, etc.)
- Presence of adequate signage.

Appendix A

Glossary of Terms

Appendix A - Glossary of Terms

Best Management Practice (BMP) - Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from point and non-point sources.

DEQ – Oregon Department of Environmental Quality.

Dry Well - Dry wells are reinforced concrete cylinders similar in construction to a manhole with openings in the walls that allow water to percolate out into the surrounding soils. They are similar to infiltration trenches but smaller with inflow from pipes; commonly covered with soil and used for drainage areas of less than 1 acre.

EPA – U.S. Environmental Protection Agency.

Existing Development - Means planned construction, alteration, or reconstruction at a commercial or industrial facility, whether currently in operation or where operations have been suspended or halted but existing buildings or others structures are suitable for industrial or commercial use, with or without alteration, reconstruction and new construction.

Groundwater - The supply of fresh water found beneath the Earth's surface, usually in aquifers, which supply wells and springs.

GWPP - Columbia South Shore Groundwater Protection Program.

GWPA – Groundwater Protection Area.

Hazardous Material - For the purposes of the Columbia South Shore GWPP, mobile *Hazardous Substances*, *Halogenated Solvents*, and *Hazardous Wastes* are referred to as *Hazardous Materials*. This definition may differ from that used in other regulatory contexts.

Halogenated Solvent - Any liquid with a specific gravity greater than 1.0 at ambient temperature, and contains at least ten (10) percent of a chemical or chemicals (by weight) classified as a halogenated organic compound. A list of halogenated solvents is provided in Appendix A of the Reference Manual.

Hazardous Substance – Any mobile chemical or mobile chemical mixture that contains one or more constituents listed in the current version of the U.S. EPA publication Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA) and Section 112(r) of the Clean Air Act (EPA 550-B-01-003, or as updated), at a concentration of at least ten (10) percent (by weight). The 'Chemical List of Lists' is included as Appendix C of the Reference Manual. Materials included on the 'Chemical List of Lists' that would normally be considered under the Petroleum definition, below, including but not limited to, propane (CAS 74-96-6) and methane (CAS 74-82-8) shall be excluded from the definition of Hazardous Substance and addressed as Petroleum products.

Hazardous Waste – A Hazardous Waste defined pursuant to OAR Chapter 340, Division 101, shall be considered a *Hazardous Material* at the regulatory threshold concentrations or definitions at which they are deemed to be a hazardous waste by the Oregon Department of Environmental Quality. For the purposes of the WHPP, hazardous wastes shall be considered mobile.

Infiltration - The penetration or percolation of water through the ground surface into sub-surface soil.

Mobile Chemical - A mobile chemical is (a) any liquid at ambient temperature, or (b) a solid that has an aqueous solubility of at least ten (10) percent by weight as determined from its Material Safety Data Sheet (MSDS) or other published chemical reference.

Non-Point Sources - Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by storm water. Common non-point sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Non-Conforming Use - Means that a regulated hazardous material activity or a functional area where hazardous materials are handled (and exceeds the applicable thresholds defined in Section 1.3 of the Reference Manual) does not comply with the applicable requirements of Section 3 of the Reference Manual.

New Development - Means the intended construction of one or more buildings on land that is not currently occupied by buildings or other structures suitable for any industrial or commercial purpose, including the situation where all prior buildings or structures on the land have been demolished in preparation for a wholly new use of the land.

Permeability - The rate at which liquids pass through soil or other materials in a specified direction, usually expressed in terms of centimeters per second (cm/sec).

Petroleum Fuel or Fuel – Means petroleum-based liquid products that are refined from crude oil specifically for fuel purposes. Fuel includes, but is not limited to, all grades of automotive gasoline, aviation gasoline, diesel, heating oils, and kerosene.

Petroleum or Petroleum Products - Means petroleum-based products in any form, including but not limited to crude oil, fuel oils including gasoline and diesel, mineral oil, sludge, oil refuse, and refined products. Typical uses of refined products includes, but is not limited to lubricants, non-PCB electrical insulating fluids, heat transfer fluids, brake fluid, hydraulic fluids, refrigeration fluids, cutting/machining fluids and coolants, and grease. The term *Petroleum or Petroleum Products* includes *Petroleum Fuel*. Excluded from this definition are petroleum- and fossil-fuel derived gases such as propane, natural gas, liquefied natural gas, and methane that will be present in a gaseous state at ambient temperature and pressure.

Point Source - A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution; e.g., a pipe, ditch, ship, ore pit, factory smokestack.

Runoff - That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface-water.

Run-on - Storm water run-on is runoff that flows from another property or another area onsite onto an area where hazardous materials are stored or handled. Uncontrolled run-on increases the volume of potentially contaminated storm water to be managed.

Sanitary Sewer - Underground pipes that carry off only domestic or industrial waste, not storm water.

Storm Sewer - A system of pipes (separate from sanitary sewers) that carries water runoff from buildings and land surfaces.

Surface Runoff - Precipitation, snow melt, or irrigation water in excess of what can infiltrate the soil surface and be stored in small surface depressions.

Appendix B

Technical Interpretation Memorandums

Appendix B – Technical Interpretation Memorandums

From time to time, the City may issue technical interpretations on particular issues regarding implementation of the Groundwater Protection Program. Generally, these will be clarifying statements about how the City interprets the meaning of the Reference Manual requirements based on how the particular issue was intended to be regulated during program development.