Columbia South Shore Well Field
Wellhead Protection Area

Reference Manual

June 25, 2003
Amended March, 2017

GROUNDWATER
PROTECTION PROGRAM
COLUMBIA SOUTH SHORE

City of Portland
Portland Water Bureau

City of Gresham

City of Fairview

Columbia South Shore
Well Field Wellhead Protection Program Reference Manual

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Introduction

The Columbia South Shore Well Field Wellhead Protection Area Reference Manual is a technical document outlining groundwater protection requirements within the Columbia South Shore Well Field Wellhead Protection Area. The Protection Area encompasses portions of the cities of Fairview, Gresham and Portland. Each jurisdiction adopted ordinances to establish a wellhead protection program and has the authority to implement and enforce the requirements contained in the Reference Manual. Therefore, the terms "City" and "Cities" used herein apply to all three partner cities. Requirements or references that only apply within an individual City are clearly identified as such.

Summary of Changes to the Columbia South Shore Well Field Wellhead Protection Area Reference Manual.

The Reference Manual was adopted in Fairview and Gresham in December 2002 and in Portland in June 2003. The Manual was first updated in March 2010. The MONTH 2016 version reflects the second update. Changes include:

- Replacement of the term "applicable" with the term "required", to ensure consistency and clarity.
- Replacement of the term "governing jurisdiction" with the term "City" to ensure consistency and clarity.
- References to the Oregon Fire Code have been updated to align with the 2014 version of the code, which is the most recent version adopted by the City.
- References to the City of Portland Stormwater Manual have been updated to align with the most recent version (2016) and to reference the new Source Control Manual where appropriate.
- Spill reporting resources, including local City contact information, has been incorporated into the General Requirements for all regulated facilities in Section 3.1.
- Section 3.6 has been amended to apply a uniform definition of Transportation Routes across cities and align with updated street classifications. The language has been streamlined for ease of use. No substantive changes to Section 3.6 have been made.
- Section 5 has been amended to remove the option of submitting a Hazardous Substance Information Survey Report (HSIS) to satisfy a facility's annual reporting requirement. The Office of the State Fire Marshall increased the reporting thresholds for the HSIS in 2013, making it no longer equivalent to the regulated thresholds contained within the Reference Manual. An alternative local reporting format has been developed to mimic the HSIS process and minimize the impacts of this change to regulated businesses.
- Appendix B – US EPA Chemical "List of Lists" has been updated to reflect the most recent updates, which EPA promulgated in March, 2015. The EPA updates notably include nonylphenols as a new category. In addition to industrial applications, nonylphenols can be found in lubricating oils and detergents.

Section 1 Regulated Area and Identification of Chemical Thresholds for Regulation

1.1 Objectives and Regulatory Program Outline

The objectives of the Columbia South Shore Well Field Wellhead Protection Program (CSSW WHPP) are:

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

At the same time, the Cities of Gresham, Fairview and Portland (referred to herein as City or Cities) are committed:

- To sustain existing commerce in the area; and
- To provide for continued economic development and growth within the wellhead protection program area.

The wellhead 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 when applicable;
- To be consistent with other requirements;
- To be balanced and implementable, and
- To 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.

1.2 Regulated Area Boundary

1.2.1 CSSW Groundwater Resource Wellhead Protection Area

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 Resource Wellhead Protection Area (WHPA). The area (see Figure 1[1]) includes portions of the Cities of Portland, Gresham, and Fairview. The groundwater resource protection areas include the:

City of Portland
Columbia South Shore (COSS) Plan District
Cascade Station/Portland International Center (CS/PIC) Plan Districts

City of Gresham
Columbia South Shore Overlay

City of Fairview
Wellhead Protection Overlay District

Multnomah County
Blue Lake Park (City of Fairview)
Area between Blue Lake and Fairview Lake (Interlachen Community)

[1] Figure 1 has been reproduced from Chapter 21.35 – Wellhead Protection of the City of Portland Water Code.

1.2.2 Definition of Zones

The area denoted in Figure 2 shall be referred to as Zone 1. The City of Portland has determined that this area of the WHPA is geologically and hydrogeologically dissimilar from the majority of the area included in the WHPA. As provided in Section 2.1 – New and Modified Facilities, certain provisions of this manual apply specifically to new and modified developments located in Zone 1.

All areas of the WHPA not located within Zone 1 shall be referred to as Zone 2 for convenience.

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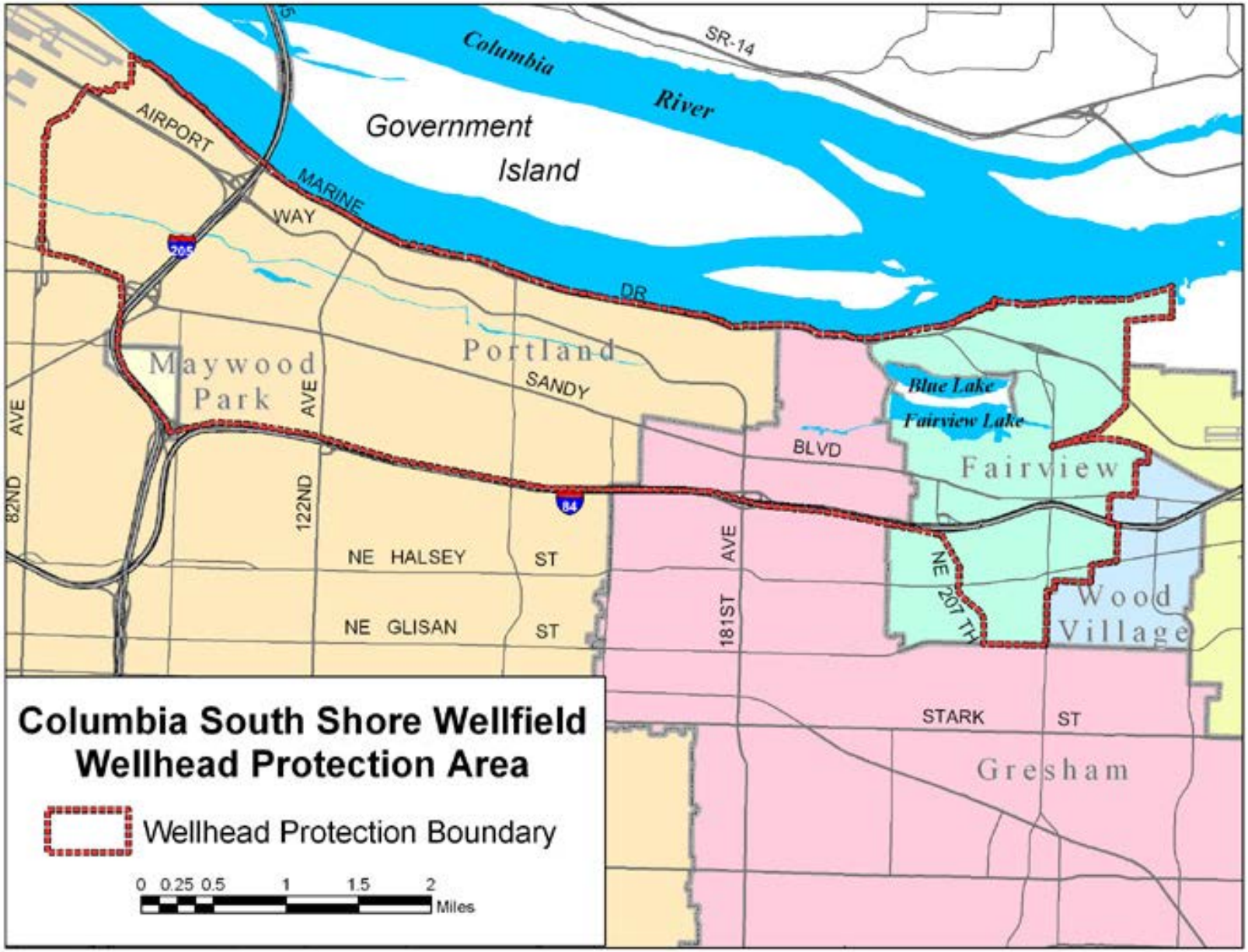

Figure 1 - Well Field Wellhead Protection Area Map

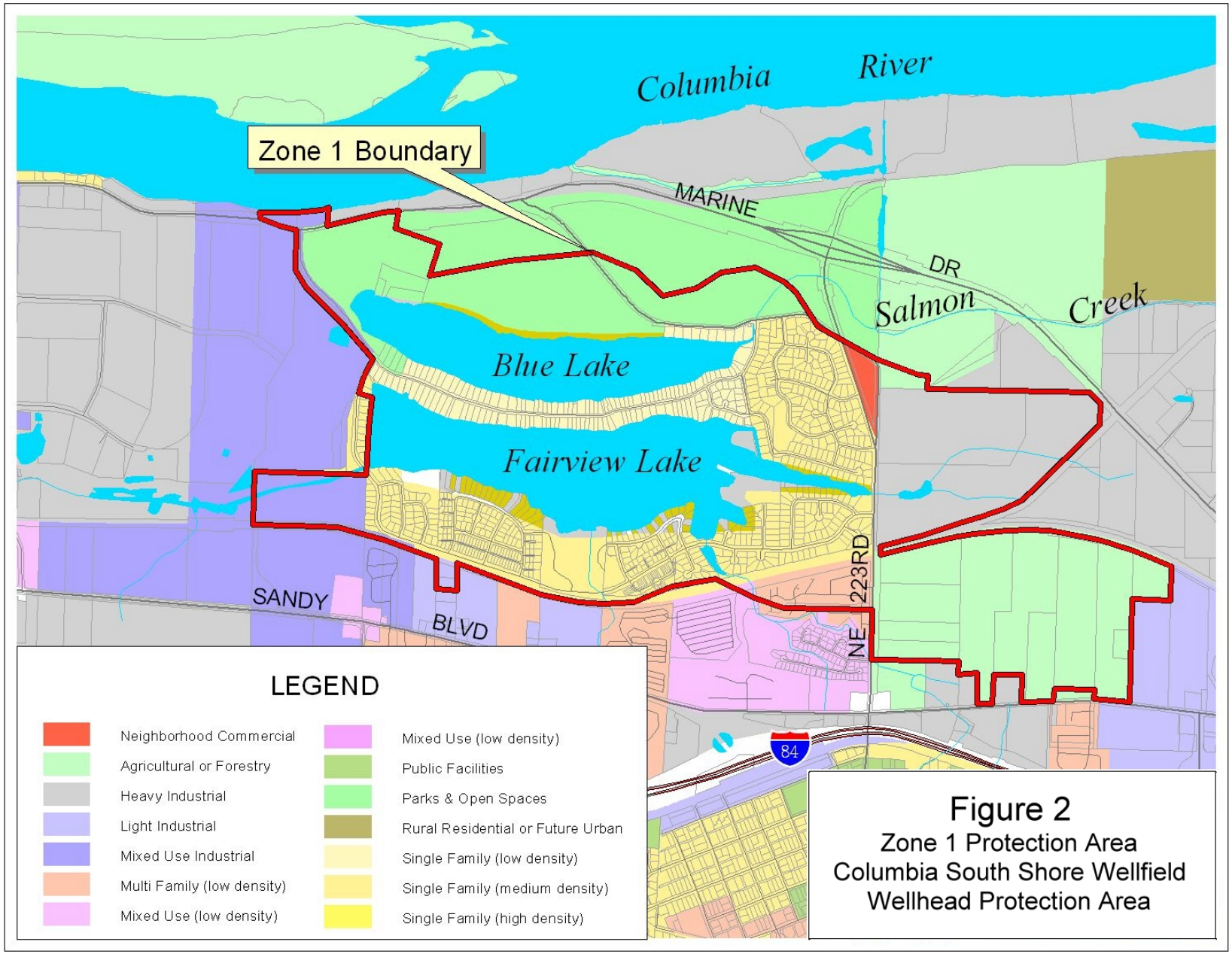

Figure 2 – Zone 1 of Wellhead Protection Area

1.3 Regulated Materials and Thresholds

For sites located in the designated WHPA, the transport, storage and use of mobile chemicals that are Halogenated Solvents, are a Hazardous Substance, are a Hazardous Waste, or are Petroleum Products (which includes Fuel) as defined below may be subject to requirements that are described in this document. For the purposes of this regulatory program, 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. As described in Section 2, sites may become regulated either through the building permit process, or as part of a routine reporting and inspection program.

1.3.1 Regulated Hazardous Material Definition

As used herein, the following chemical categories are subject to regulation under the WHPP regulations and referred to as Hazardous Materials:

1) *Halogenated Solvent* - Any liquid with a specific gravity greater than 1.0 at ambient temperature, and containing at least ten (10) percent of a halogenated chemical or chemicals (by weight) is classified as a Halogenated Solvent. A list of Halogenated Solvents is provided in Appendix A.

2) *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 B. 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.

3) 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.

As used in the definitions above, and in Section 1.3.2, below, 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.

1.3.2 Petroleum Definition

As used herein, *Petroleum, Petroleum Products, and Petroleum Fuels* are defined as follows:

1) *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 include, but are 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*, below. 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.

2) *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.

1.3.3 Regulated Material Thresholds

A site that stores or uses in the aggregate any chemical, chemical mixture, or waste material defined in Section 1.3.1 or 1.3.2 that exceeds the threshold quantity defined in Table 1 is subject to the provisions of the Well Field Wellhead Protection Program. For the purposes of this Reference Manual, "use," "uses," or "used" means the material that is present at a facility at any one time, in addition to materials in storage. In determining the threshold quantity for a particular site, those chemicals defined in Section 1.4 are exempt and need not be considered when determining the threshold quantity.

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Table 1 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 5.1 Reporting Only)

[a]As defined in 1.3.1, 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 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.

1.4 Exempt Uses and Materials

This section does not exempt any material or use from Fire Code regulations adopted by the City. Except as otherwise provided herein, the following materials are exempt from regulation and are not counted towards the threshold quantity determination of Section 1.3.3:

1) A Hazardous Material/ Fuel Exemption Request may be submitted to the City for uses of Hazardous Materials, or Fuels, that can be demonstrated to pose no threat to the ground waters of the WHPA. These materials or uses may be exempted from regulation and added to the list of exempted materials or uses contained in this Section. The demonstration of no threat is the responsibility of the applicant seeking the exemption and will be subject to review as specified by the City, including a process for appeal of the initial decision.
2) Petroleum Products EXCEPT Fuels that are not considered to be a Hazardous Material pursuant to Section 1.3.1, are subject only to the Hazardous Material Inventory Report

required in Section 5.1. (Note: Fuels are subject to the applicable sections of this Manual, including Section 5.1.)

3) Hazardous Materials or Fuels offered for sale in their original sealed containers of five (5) gallons or less, including aerosol-based products. Sealed containers that are opened indoors at the retailer's premises for the sole purpose of adding pigments or other components and immediately resealed are also exempt under this provision.
4) (a) Hazardous Materials or Fuels in fuel tanks and fluid reservoirs permanently attached or connected to (i) a private or commercial motor vehicle (including bulk delivery vehicles) and used directly in the motoring operation of that vehicle, (ii) machinery, including but not limited to fuel, engine oil and coolants, and (iii) fuel, engine oil, coolants, and hydraulic fluids contained on-board and associated with the operation of aircraft or other aviation equipment.
   (b) This exemption does not apply to Hazardous Materials or Fuels (i) considered to be freight or cargo, (ii) 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, or (iii) at facilities engaged in the dismantling, salvaging, or scrapping of vehicles or equipment that have undrained fuel tanks or other undrained fluid reservoirs that contain Hazardous Materials or Fuels at the time they are received at the facility.
   (c) For the non-exempt uses defined in paragraph (b), above, the threshold volumes identified in Table 1 are considered to be site-wide aggregate volumes, not the volume contained in a tank or fluid reservoir of an individual vehicle, truck, or piece of equipment.
   (d) For the non-exempt uses identified in (b)(ii) and (b)(iii), above, the areas of the facility used for the storage of vehicles or equipment shall meet the requirements of Section 3.8 – Storage, Maintenance, and Repair of Vehicles and Equipment and the Hazardous Material Inventory Report required in Section 5.1.
5) Hazardous Materials or Fuels contained in properly operating closed-loop units (e.g., transformers, refrigeration units, hydraulic cylinders and reservoirs, etc.) that are not opened as part of routine use. This exemption does not apply to units located outdoors unless the unit is located on a roof, is located on a paved surface, or is located on an equipment pad that has secondary containment.
6) Fuel oil used in space heating systems.
7) All commonly used office supplies such as correcting fluid for typewriters, toner for computer printers, etc., where the supplies are purchased off-site for use on-site. The total quantity of exempt office supplies shall not exceed 55 gallons per functional area. Office supplies packaged in containers of five (5) gallons or less are exempt from the 55-gallon functional area limit.
8) Hazardous Materials or Fuels, including aerosol-based products, purchased for use onsite and packaged in comparable form and concentration as a product available for sale or use by the general public. Products containing halogenated solvents at concentrations greater than 10 percent (%) by weight are not exempt under this provision.
9) The storage, handling, and use of Hazardous Materials or Fuels for non-routine maintenance, repair of property, or equipment. The storage, handling, and use shall not exceed an aggregate of fifty-five (55) gallons or four hundred sixty (460) pounds at any time. Products containing halogenated solvents at concentrations greater than 10 percent (%) by weight are not exempt under this provision.
10) The temporary storage, handling, and use of Hazardous Materials or Fuels associated with onsite construction activities by third-party contractors.
11) The handling and application of fertilizer, plant growth retardants, and pesticides in accordance with accepted agronomic practices and manufacturer's label instructions.

12) The handling and application of aircraft deicing and pavement anti-icing products provided they are used in accordance with the manufacturer's label instructions.
13) The storage, handling, and use of Hazardous Materials or Fuel for medical and research laboratory uses, provided however, that the Hazardous Material or Fuel shall be stored, handled or used in containers not to exceed five (5) gallons or forty-five (45) pounds of each substance and the aggregate inventory of hazardous substances shall not exceed two hundred and fifty (250) gallons or twenty-one hundred (2,100) pounds.
14) A pipeline facility (including gathering lines) regulated under: (1) the Natural Gas Pipeline Safety Act of 1968, or (2) the Hazardous Liquid Pipeline Safety Act of 1979; or (3) which is an intrastate pipeline facility regulated under State laws comparable to the provisions of law referred to in (1) and (2) above.
15) Hazardous Materials or Fuel stored, handled, or used for emergency purposes. The duration of this exemption is limited to 90 days, unless otherwise approved by the City.
16) Fuel for emergency generators located at facilities that provide essential community services (hospitals, fire/life safety, police, public shelters, telephone systems, etc.), and emergency generators at public or private facilities that are used to provide back-up power supplies necessary to assure critical operations and life safety systems during failure of the primary power supply. This exemption applies to emergency generator installations that are equipped with double-walled fuel tanks, are equipped with the tanks that meet the secondary containment requirements of Section 3.3 – Indoor Storage Areas, or 3.5 – Outdoor Storage Areas, or installations equipped with underground fuel storage tanks.
17) Hazardous Materials or Fuels used and stored specifically for water treatment processes of public water systems and private systems for the same purposes when approved by the City.

Section 2 Applicability of Wellhead Protection Area Regulations

In order to establish the applicability of requirements, the applicant (in the case of a development permit) or the facility (in the case of routine reporting) must provide information on the Hazardous Materials Inventory form described in Section 5.1. Based on the results of the inventory, the applicant/facility may have no further requirements if:

- The Hazardous Materials or Fuels transported, stored, or used at the site are not mobile;
- The Hazardous Materials or Fuels transported, stored, or used at the site are exempt under Section 1.4, or
- The quantity of Hazardous Materials or Fuels transported, stored, or used onsite does not exceed specified threshold quantities in Table 1.

Figure 3 provides a simplified diagram for determining the applicability of the Wellhead Protection Program to an individual site or facility.

2.1 New and Modified Facilities

2.1.1 All Zones

An application for development permit for commercial or industrial development involving site design review or a building permit for a new development[2] or modification of an existing facility shall be reviewed for storage, use and transportation of Hazardous Materials, Petroleum Products, and Fuels as follows:

1) The application for development permit shall be reviewed to determine if there is/will be the presence of Hazardous Materials, Petroleum Products, and Fuels as defined in Section 1.3.1 – Regulated Hazardous Material Definitions and Section 1.3.2 – Petroleum Definition.

2) If the application for development permit includes a Hazardous Material, Petroleum Product, or Fuel as determined in subsection (1) above, then the applicant shall complete a Hazardous Material Inventory Report pursuant to methods described in Section 5.1 – Annual Hazardous Material Inventory Report.

3) A determination of the quantity of Hazardous Materials or Fuels inventoried as provided in subsection (2) above shall be completed pursuant to Section 1.3.1, 1.3.2, and Section 1.4 – Exempt Uses and Materials.

4) If the determination made in subsection (3) above indicates that the quantity of any Hazardous Materials or Fuels exceeds the thresholds defined in Table 1, the functional area(s) (defined in Section 3.2) of the facility included in the development proposal that will include the storage, handling, use, or transportation of Hazardous Materials or Fuels shall meet the applicable requirements of Section 3- Requirements and Recommendations, unless the provisions of sections 2.1.2 and 2.2, below, apply.

   Guidance to Facility Owners/Tenants/Operators Located within the City of Portland portion of the WHPA: Within the City of Portland, new or modified development may also be subject to certain requirements of the Portland *Stormwater Management Manual* and *Source Control Ma nual* as published by the Bureau of Environmental Services. In the event of conflicting requirements between this manual and the *Stormwater Management Manual or Source Control Manual*, the more stringent requirement(s) shall apply.

[2] For the purposes of this Manual, 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 others structures are suitable for industrial or commercial use, with or without alteration, reconstruction and new construction, shall be considered an "existing development" or “existing facility”.

2.1.2 Special Requirements for New or Modified Development in Zone 1

This section applies to development located in Zone 1 of the WHPA (see Figure 2).

If the determination made in subsection 2.1.1(3) above indicates that the quantity of any Hazardous Materials or Fuels exceeds ten (10) times the thresholds defined in Table 1, the functional areas (defined in Section 3.2) of the facility included in the development proposal that will be used for the storage, handling, use, or transportation of Hazardous Materials or Fuels shall meet the applicable requirements of Section 3 - Requirements and Recommendations, and the following additional requirements, as applicable:

1. Annual Inspection. The City reserves the right to perform annual inspections of the facility.
2. Loading and Unloading Areas. The requirements of Section 3.4.1 are superceded with the requirement that all designated Hazardous Material or Fuel loading and unloading areas must employ the use of one or more of the following structural controls defined below:
    (a) Indoor transfer facilities,
    (b) Covered loading docks, or
    (c) Loading docks equipped with door skirts.

3. Consistent with Oregon Fire Code requirements and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building, under a roof, or lean-to, or other appropriate cover.
4. Install/maintain overhangs, or door skirts that enclose the trailer end (see Diagrams 2.1 and 2.2) to prevent contact with rainwater.
5. Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
6. Retain on-site the necessary materials for rapid cleanup of spills.

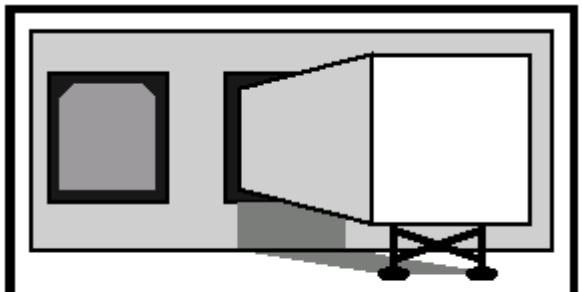

Diagram 2.1 – **Loading Dock with Door Skirt**

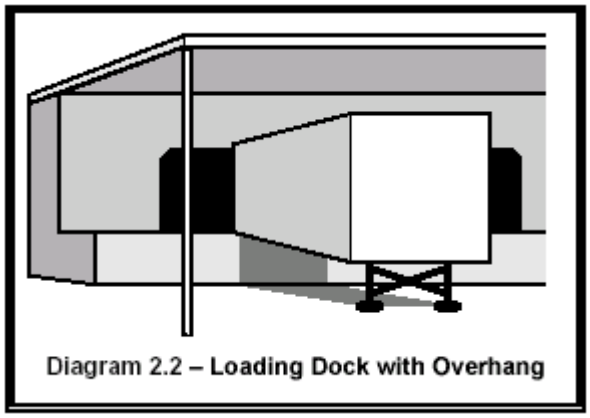

Diagram 2.2 – Loading Dock with Overhang

2.2 Existing Facilities

Annually, facility owners, operators, or tenants[3] at existing facilities shall review whether it handles Hazardous Materials, Petroleum Products, or Fuels, and determine whether the requirements of WHPA apply:

1) Review Hazardous Material Inventory completed pursuant to methods described in Section 5.1 – Annual Hazardous Material Inventory Report.

2) A Determination of the quantity of Hazardous Materials or Fuels inventoried as provided in subsection (1) above shall be completed pursuant to Section 1.3.1, 1.3.2, and Section 1.4.

3) If the determination made in subsection (2), above indicates that the quantity of any Hazardous Materials or Fuels exceed the thresholds defined in Table 1, the facility is subject to the applicable requirements of Section 3- Requirements and Recommendations.

4) The onsite functional area(s) defined in Section 3.2 used for the storage, handling, use, or transportation of Hazardous Materials or Fuels that exceed the thresholds defined in Table 1, but do not conform with the applicable requirements of Section 3 are considered to be *non-conforming use(s)* at the time they become subject to the requirements of Section 3.

5) Within 60 days of determining that an existing facility has non-conforming use(s) as defined in (4), above, the owner, operator, or tenant must (a) remedy all non-conforming use(s) or (b) submit a Compliance Plan to the City that details how the facility will correct its non-conforming uses. The Compliance Plan must establish a reasonable timeframe for correcting all non-conforming uses or the implementation of alternative storage, handling, use, transportation, or containment practices that are capable of satisfying the requirements of Section 3. If a development permit is necessary to remedy non-conforming use(s), the facility must also follow the applicable requirements of

[3] For non-owner operated facilities, the reporting obligation is the responsibility of the facility operator or tenant.

Section 2.1. A Compliance Plan shall be subject to review and approval by the City. Provide to the City three (3) copies and an electronic version of the proposed compliance plan, tables, figures and any other supporting information.

At a minimum, a Compliance Plan shall include the following information:

- Name and address of person (petitioner) seeking Compliance Plan approval,
- Provide written descriptions, including tables and figures to completely satisfy the information requirements in subsections (1), (2), and (4) above and Section 5.2 (Facility Information Report),
- Provide a written description, including tables and figures that demonstrates how compliance with subsection (3), above will be achieved,
- Provide a written schedule for implementation of all necessary actions to comply with subsection (3) above, and
- Other information requested by the City.

Guidance to Facility Owners/Tenants/Operators of Existing Non-Conforming Uses Located within the City of Portland portion of the WHPA: Within the City of Portland, facility modifications to remedy non-conforming use(s) may also be subject to certain requirements of the Portland *Stormwater Management Manual* and *Source Control Manual* as published by the Bureau of Environmental Services. In the event of conflicting requirements between this manual and the *Stormwater Management Manual or Source Control Manual*, the more stringent requirement(s) shall apply.

6) Requests for Extension. A facility may seek no more than two consecutive 6-month extensions to an approved Compliance Plan to remedy all non-conforming use(s) upon reasonable demonstration to the City that it will be unable to meet a deadline defined in the Compliance Plan. The facility seeking the extension must prepare a written request to the City no later than 30-days prior to the approved compliance deadline explaining the need for the extension.

   A demonstration may be based on financial condition, engineering considerations, or other extenuating factors that make necessary facility operational or physical improvements infeasible to complete before the compliance deadline. If financial considerations are cited as a reason for the extension request, the facility may be asked to produce auditable financial statements demonstrating its financial inability to meet the compliance deadline.

   To be granted an extension, the facility must document that it has been taking all practicable steps to plan for and meet the deadline(s) defined in the approved Compliance Plan. The extension request must also include a schedule that defines when the facility will be in final compliance.

   The City reserves the right to deny an extension request if, in its opinion, the facility should be capable of meeting the compliance deadline defined in an approved Compliance Plan.

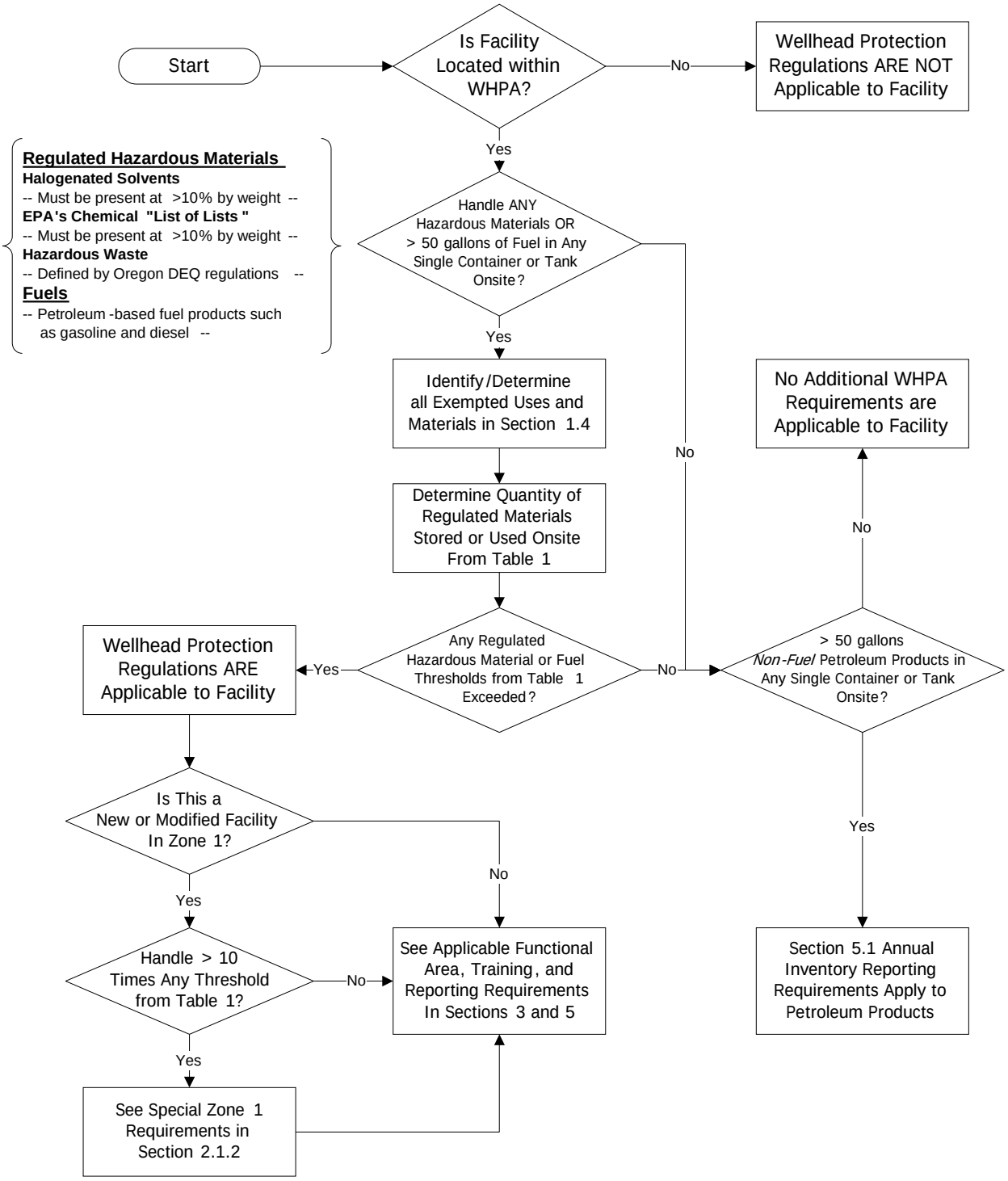

Figure 3
Wellhead Protection Program
Applicability Screening Diagram

Section 3 Requirements and Recommendations

3.1 General Requirements

3.1.1 Coordination with State and Federal Requirements

Where state or federal regulations (including the Oregon Fire Code, as adopted or amended by the City) requires the use of best management practices (BMPs), or other defined controls for the use, storage, or management of Hazardous Materials or Fuels, the City shall accept a facility's conformance with the state or federal requirements as satisfying the City's requirements for the protection of ground waters of the WHPA, provided that the facility can demonstrate that the minimum standards of Section 3 of this manual are being satisfied with the equivalent controls or procedures.

Where state or federal regulations (including the Oregon Fire Code, as adopted or amended by the City) requires the preparation of spill or emergency response plans, training programs, recordkeeping, or reporting, the City shall accept a facility's conformance with the state or federal requirements as satisfying the City's requirements for the protection of ground waters of the WHPA, provided that the training requirements of Section 3.9 (if applicable to the facility) and the reporting information required in Section 5.2 (applicable to all facilities) is satisfied.

3.1.2 Best Management Practices

Best Management Practices (BMPs) are schedules of activities, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of Hazardous Materials or Fuel to ground waters of the Wellhead Protection Area.

Source Control BMPs are structures or operations that are intended to prevent Hazardous Materials or Fuels from coming into contact with stormwater or groundwater through physical separation of areas or careful management of activities that are potential sources of Hazardous Materials or Fuels:

- *Operational Source Control BMPs* are non-structural practices that prevent or reduce Hazardous Materials or Fuels 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, inspections of Hazardous Material or Fuel sources, and record keeping. They can also include process changes, raw material/product changes, and recycling wastes.

- *Structural Source Control BMPs* are physical, structural, or mechanical devices or facilities that are intended to prevent Hazardous Materials or Fuel from entering stormwater or groundwater. Examples of Structural Source Control BMPs typically include:

    - Enclosing and/or covering the potential 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.
    - Devices that direct only contaminated stormwater to appropriate treatment BMPs (e.g., discharge to a sanitary sewer if allowed by the local sewer authority).

3.1.3 Distinction between Requirements and Recommendations

This document describes requirements (i.e., those measures which must be implemented) and recommendations (those which are not mandatory). Use of the word 'Shall' means that the requirement is mandatory. Use of the words 'May' and 'Should' are permissive.

3.1.4 Required Operational Source Control BMPs

The following *operational source control BMPs* shall be implemented at establishments that exceed the regulated material quantity thresholds defined in Section 1.3.3.

Pollution Prevention Team

- Assign one or more individuals to be responsible for onsite Hazardous Material or Fuel management. If appropriate, hold periodic meetings to review the overall operation of the BMPs. Establish responsibilities for inspections, operation and maintenance, and availability for emergency situations. Train all team members in the operation, maintenance and inspections of BMPs, and reporting procedures.

Good Housekeeping

- Promptly contain and clean up Hazardous Material or Fuel leaks and spills.
- Promptly repair or replace all substantially cracked or otherwise damaged paved secondary containment and any other drainage areas, which are subjected to Hazardous Material or Fuel leaks or spills.
- Promptly repair or replace all leaking connections, pipes, hoses, valves, etc. which can contaminate groundwater.

Preventive Maintenance

- Prevent the discharge of Hazardous Materials or Fuels to ground or surface water, or to storm drains which discharge to surface water, or to the ground.
- 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 material may be considered.

Spill Prevention and Cleanup

- Immediately upon discovery, stop, contain, and clean up all spills.
- Have spill containment and cleanup kits readily accessible.
- If a spill has reached or may reach a sanitary or a storm sewer, groundwater, or surface water notify the appropriate authority immediately.
- 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
- Do not flush absorbent materials or other spill cleanup materials to a storm drain. Collect the contaminated absorbent material as a solid and place in appropriate disposal containers.

Employee Training

- At least annually, the owner/operator of the facility shall provide training to all facility personnel that handle Hazardous Materials or Fuels. This training may be performed in-house or externally as may

be offered by sponsoring organizations or businesses located in the WHPA. At the minimum, the training must include the basic elements and recordkeeping defined in Section 3.9.

3.1.5 Recommended Operational Source Control BMPs

The following *operational source control BMPs* are recommended, but not required, at the establishments that exceed the regulated material quantity thresholds defined in Section 1.3.3.

Good Housekeeping

- Clean up Hazardous Material or Fuel liquid leaks and spills in impervious uncovered containment areas at the end of each working day.
- Use solid absorbents, e.g., clay and peat absorbents and rags for cleanup of liquid spills/leaks, where practicable.
- Recycle materials, such as oils, solvents, and wood waste, to the maximum extent practicable.

Preventive Maintenance

- Conduct all oily parts cleaning, steam cleaning, or pressure washing of equipment or containers inside a building, or on an impervious contained area, such as a concrete pad. Direct contaminated stormwater from such an area to a sanitary sewer where allowed by local sewer authority, or to other approved treatment.
- Do not pave over contaminated soil unless it has been determined that ground water has not been and will not be contaminated by the soil.
- Sweep paved material handling and storage areas regularly as needed, for the collection and disposal of contaminated dust and hazardous material debris that could contaminate stormwater. Do not hose down Hazardous Materials or Fuel from any area to the ground, storm drain, conveyance ditch, or receiving water unless necessary for dust control purposes to meet air quality regulations and unless the Hazardous Materials or Fuels are conveyed to a treatment system approved by the City.
- Clean oils, debris, sludge, etc., from all BMP systems regularly, including catch basins, settling/detention basins, oil/water separators, boomed areas, and conveyance systems, to prevent the contamination of stormwater.
- Use drip pans to collect leaks and spills from industrial/ commercial equipment such as cranes at ship/boat building and repair facilities, log stackers, industrial parts, trucks and other vehicles, which are stored outside.
- At regulated facilities, drain oil and fuel filters before disposal. Discard empty oil and fuel filters, oily rags and other oily solid waste into appropriately closed and properly labeled containers, and in compliance with the Oregon Fire Code.
- For the storage of liquids, use containers, such as steel and plastic drums that will be compatible with the liquid stored, that are rigid and durable, corrosion resistant to the weather and fluid content, non-absorbent, water tight, rodent-proof, and equipped with a close fitting cover.
- For the temporary storage of solid wastes contaminated with Hazardous Materials or Fuels, use dumpsters, garbage cans, drums and comparable containers, which are durable, corrosion resistant, non-absorbent, non-leaking, and equipped with either a solid cover or screen cover to prevent littering. If covered with a screen, the container should be stored under a lean-to or equivalent structure.
- Where exposed to stormwater, use containers, piping, tubing, pumps, fittings, and valves that are appropriate for their intended use and for the contained liquid.
- Where feasible, store Hazardous Materials or Fuels inside a building or under a cover and/or containment.
- Minimize use of toxic cleaning solvents, such as chlorinated solvents, and other toxic chemicals.

- Use environmentally safer raw materials, products, additives, etc. such as substitutes for zinc used in rubber production.
- Recycle waste materials such as solvents, coolants, oils, degreasers, and batteries to the maximum extent feasible.
- Empty drip pans immediately after a spill or leak is collected in an uncovered area.
- Stencil warning signs at stormwater catch basins and drains, e.g., "Dump no waste."

Spill Prevention and Cleanup

- Place and maintain emergency spill containment and cleanup kit(s) at outside areas where there is a potential for liquid Hazardous Material or Fuel spills. These kits should be appropriate for the materials being handled and the size of the potential spill.
- Spill kits should include appropriately lined drums, absorbent pads, and granular or powdered materials for neutralizing acids or alkaline liquids where applicable. In fueling areas: absorbent should be packaged in small bags for easy use and small drums should be available for storage of absorbent and/or used absorbent. Spill kits should be deployed in a manner that allows rapid access and use by employees.

3.2 Identification of Functional Areas

The facility shall identify all functional areas that will be present on the proposed development or existing site. These "functional areas" are associated with certain kinds of Hazardous Material or Fuel management activity. Functional areas may include (but are not limited to):

- ***Storage areas*** include work and process areas where Hazardous Materials or Fuels are stored. These include both indoor and outdoor areas.

- ***Loading/unloading areas*** are any areas that: 1) are designed (size, width, etc.) to accommodate a truck/trailer being backed up to or into them, and 2) 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.

- ***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.

- ***Transportation routes*** are any paths used to transport Hazardous Materials onto, off of, or within a site. Transportation routes also include public transportation routes such as streets and alleys, and publicly or privately owned rail lines.

- ***Fuel dispensing facilities*** are defined as the area where Fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers (including fuel islands, above-ground fuel tanks, fuel pumps, and the surrounding pad). This applies to bulk terminals, gas stations and single-pump fueling operations. Fuel dispensing facilities do not include mobile fueling/service rigs used for fueling vehicles or emergency generator installations equipped with integrated fuel tanks.

If the total quantity of an individual category of Hazardous Material stored or handled in a specific functional area (such as a maintenance area) does not exceed 25 percent of the facility quantity threshold for the material defined in Table 1, or 50 gallons of Fuel in any single tank or container, the functional requirements of Section 3 are not required for that specific functional area.

3.3 Indoor Storage Areas

The requirements of this section apply to Hazardous Material storage activities conducted inside a building. See Section 3.3.1.2 for the applicability of this section to the indoor storage of Fuel.

3.3.1 General Requirements

The requirements in this section do not modify or exempt any material or substance otherwise regulated by the Oregon Fire Code[4] as adopted by the City.

3.3.1.1 Hazardous Materials

Hazardous Materials (as defined in Section 1.3.1) that are stored indoors in excess of the applicable threshold amounts defined in Table 1 of Section 1.3.3 shall be stored in areas equipped with spill control and secondary containment as defined by the Oregon Fire Code (OFC), Section 5004.2. (Note: The capacities for liquids and solids requiring secondary containment pursuant to OFC Section 5004.2.2 are modified by this document to be consistent with the threshold amounts defined in Table 1 of Section 1.3.3).

Unless otherwise required by the Oregon Fire Code as adopted by the City, if the total quantity of any individual category of Hazardous Material stored or handled in a specific functional area (such as a maintenance area) does not exceed 25 percent of the quantity threshold for the material defined in Table 1, spill control and secondary containment is not required in that specific functional area.

Consistent with the Oregon Fire Code as adopted by the City, facilities may alternatively use equivalent means of providing spill control and secondary containment in lieu of OFC Section 5004.2.2 for indoor storage, including:

- OFC Section 5003.8.7 – Hazardous materials storage cabinets,
- OFC Section 5004.2.3 – Containment pallets (unless expressly prohibited by the Oregon Fire Code), or
- Other equivalent means defined in Chapters 50 and 57 of the Oregon Fire Code.

Unless otherwise required by the Oregon Fire Code as adopted by the City, facilities may use the following equivalent means of providing spill control and secondary containment in lieu of conforming to OFC Section 5004.2.2 for indoor storage:

- Double-walled tanks or containers, or
- Other devices that provide tank or container-specific secondary containment (such as portable spill containment devices or shelters, overpack containers, etc.) that provide containment for 110 percent of the volume of the largest single container, or 10 percent of the volume of the combined volume of containers, whichever is greater.

[4] Oregon Fire Code; 2014 Edition; © 2014 by International Code Council, Inc, unless the City has adopted an updated code version.

3.3.1.2 Fuels

The requirements of Section 3.3 do not apply to the indoor storage of Fuel.

[Advisory Note: Facilities should note that the Oregon Fire Code, as adopted by the City, might impose compliance requirements for the indoor storage of Fuels. Facilities are directed to the Oregon Fire Code to determine applicable requirements. The 2014 OFC is available online at the following web address: http://ecodes.biz/ecodes_support/free_resources/Oregon/14_Fire/14_ORFire_main.html]

3.3.2 Additional Requirements

Floor Drains
Do not connect floor drains in or near indoor Hazardous Material storage or use areas to storm drains or to surface water. Floor drains are to be sealed or removed to prevent liquid entry, piped to the sanitary sewer (with appropriate shut-off valves), be blind sumps, or be directed to additional containment or treatment systems.

Liquid Tight Surfaces
All secondary containment devices shall be constructed of impervious materials or be coated with a chemical resistant coating (CRC) system that is compatible with the Hazardous Material being stored and is compatible with and will adhere to the structural aspect of the containment system (e.g., concrete, asphalt, etc.).

Impervious surfaces may consist of various fabricated metal, plastic, or synthetic materials, or be coated concrete, coated asphalt pavement, synthetic liners, or other materials. Synthetic lining systems such as a flexible membrane liner (FML) shall use materials capable of achieving an installed permeability of less than or equal to 1×10^{-6} cm/sec. Installation of CRC systems shall follow the coating manufacturer's recommendations for surface preparation, application methods, curing, and coating thickness for the type of intended service.

3.3.3 Recommended Operational or Structural Source Control BMPs

Not Applicable.

3.4 Loading and Unloading Areas

The requirements in this section apply to facilities with a Hazardous Material transfer area. Loading/unloading may occur at loading/unloading docks, bay doors, and any other building access point(s) with the size, width, etc., to accommodate a truck/trailer being backed up to, or into it. This section also applies to *Intra-site transfer areas* defined in Section 3.2.

See Section 3.4.1.2 for the applicability of this section to the loading and unloading of Fuels.

3.4.1 General Requirements

Hazardous Materials Control Approach: Cover or contain the loading/ unloading area where necessary to prevent run-on of stormwater and runoff of contaminated stormwater.

3.4.1.1 Hazardous Materials

Facilities with Hazardous Material loading and unloading areas shall follow the guidelines below:

3.4.1.1.1 Required Operational BMPs

At All Loading/ Unloading Areas:

1. 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 shall always be used when making and breaking connections (see Diagram 3.1). Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.

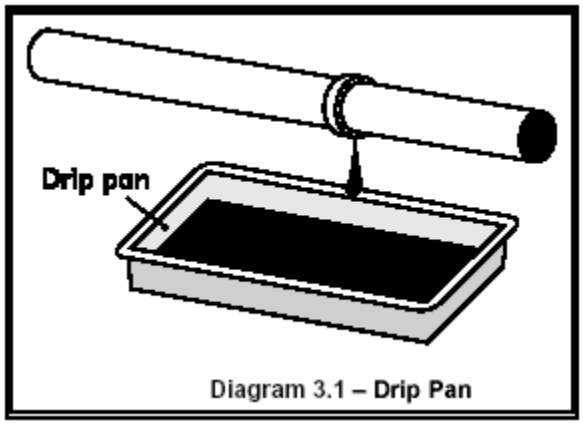

Diagram 3.1 – Drip Pan

At Tanker Truck and Rail Transfer Areas to Above/Below-ground Storage Tanks:

1. To minimize the risk of accidental spillage, prepare an "Operations Plan" that describes procedures for loading/unloading. Train the employees, especially fork lift operators, in its execution and post it or otherwise have it readily available to employees.
2. Report spills of reportable quantities to the Oregon Emergency Response System at 800-452-0311 and Bureau of Environmental Services at 503-823-7180.

At Rail Transfer Areas to Above/Below-ground Storage Tanks:

1. Install a drip pan system as illustrated (see Diagram 3.2) within the rails to collect spills/leaks from tank cars and hose connections, hose reels, and filler nozzles.

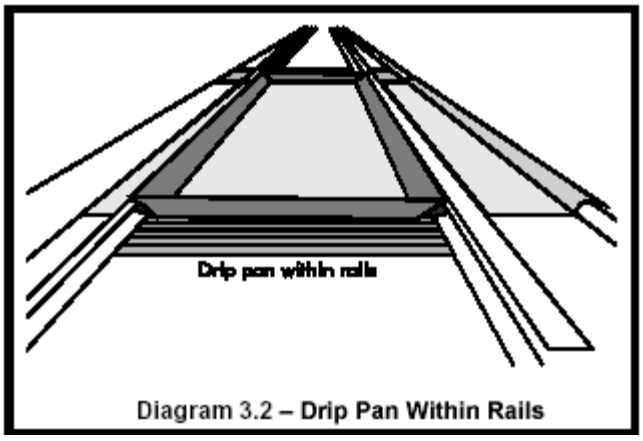

Diagram 3.2 – Drip Pan Within Rails

Transfer of Small Quantities from Tanks and Containers: Refer to Section 3.5.1

3.4.1.1.2 Required Structural Source Control BMPs

At All Loading/ Unloading Areas:

1. Consistent with Oregon Fire Code requirements and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building, under a roof, or lean-to, or other appropriate cover.
2. Berm, dike, and/or slope the loading/unloading area to prevent run-on of stormwater and to prevent the runoff or loss of any spilled material from the area.
3. Large loading areas frequently are not curbed along its perimeter. As a result, stormwater passes directly off the paved surface into surface water. To the extent practicable, place curbs along the edge, or slope the edge such that the stormwater can flow to an internal storm drain system.
4. Pave and slope loading/unloading areas to prevent the pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they should be placed in designated "alleyways" that are not covered by material, containers or equipment.

At Loading and Unloading Docks:

1. Install/maintain overhangs, or door skirts that enclose the trailer end (see Diagrams 3.3 and 3.4) to prevent contact with rainwater.
2. Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
3. Retain on-site the necessary materials for rapid cleanup of spills.

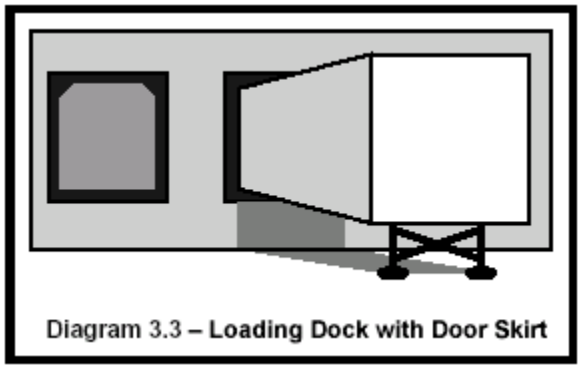

Diagram 3.3 – **Loading Dock with Door Skirt**

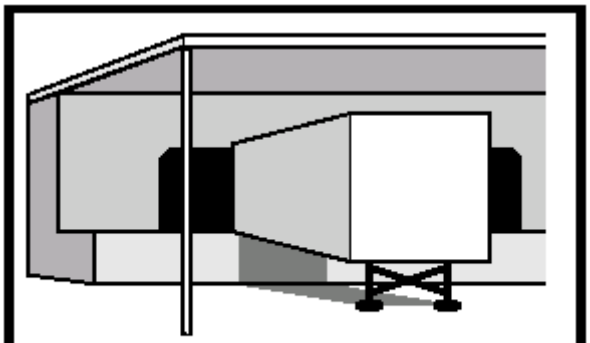

Diagram 3.4 – **Loading Dock with Overhang**

At Tanker Truck Transfer Areas to Above/Below-Ground Storage Tanks:

1. Pave the area on which the transfer takes place. If any transferred liquid, such as gasoline, is reactive with asphalt pave the area with Portland cement concrete.
2. 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. The minimum spill retention time should be 15 minutes at the greater flow rate of the highest fuel dispenser nozzle through-put rate, or the peak flow rate of the 6-month, 24-hour storm event over the surface of the containment pad, whichever is greater. The volume of the spill containment sump should be a minimum of 50 gallons with an adequate grit sedimentation volume.

3.4.1.2 Fuels

The requirements of Section 3.4.1.1, 3.4.2, and 3.4.3 do not apply to loading and unloading areas used for Fuels. See Section 3.7 for applicable requirements for Fuel Dispensing Facilities.

[Advisory Note: Areas used for the loading and unloading of Fuel might be subject to requirements imposed by the Oregon Fire Code, as adopted by the City. Facilities are directed to that reference to determine applicable requirements. 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.]

3.4.2 Additional 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 thaose documents to determine potential applicability requirements.]

Paved Surfaces and Spill Containment
A paved area shall be placed underneath and around the area where Hazardous Material loading and unloading activities will be conducted. If drainage from a loading or unloading area can enter a stormwater conveyance system, drain covers, absorbent booms, diking material sufficient to isolate spilled material, or a quick-closing valve and proper signage shall be provided.

Spill Containment Inspection Required
This requirement does not apply at facilities that use Hazardous Material loading and unloading areas that are equipped (a) with a cover, or (b) have loading docks equipped with skirts.

If drainage from a Hazardous Material loading or unloading area can enter a stormwater system in the immediate proximity where Hazardous Material loading and unloading operations are performed, the facility operator shall 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.

Signage
The following requirements apply to all Hazardous Material transfer areas/loading docks. Signage shall be provided and shall be plainly visible from all material transfer activity areas. More than one sign may be needed to accommodate large transfer areas. Signage shall be provided at the material transfer area that is plainly visible and water resistant, and shall include the following information:

Transfer procedures (i.e., instructions for operation)
Safety precautions
Immediate spill response procedures
Emergency contacts and telephone numbers

3.4.3 Recommended Operational or Structural Source Control BMPs

This section contains *recommended* operational or structural source control BMPs for Hazardous Material loading/unloading facilities.

Sections 3.4.1.1, 3.4.2, and this section are *recommended* operational or structural source control BMPs for fuel loading/unloading facilities.

Drainage
It is recommended that the first three (3) feet of the paved area measured from the building or dock face, be hydraulically isolated through grading, berms, or drains to prevent uncontaminated stormwater running onto the area and potentially conveying Hazardous Materials away from the paved area. Drainage from the hydraulically isolated area should be directed to an approved City conveyance system, sump, catch basin or other containment device, sanitary sewer, or authorized pretreatment facility.

For the transfer of liquid Hazardous Materials in areas that cannot contain a catastrophic spill, install an automatic shutoff system in case of unanticipated off-loading interruption (e.g. coupling break, hose rupture, overfill, etc.).

Pavement Coatings
Some materials can react with asphalt pavement and deteriorate its integrity. It is therefore preferable to pave the area with Portland cement concrete. If the area is already paved with asphalt, an asphalt sealant should be applied to the pavement surface. Whichever paving material is used, the paved surface should be properly maintained to prevent gaps and cracks.

3.5 Outdoor Storage Areas

The requirements in this section apply at regulated facilities that have exterior storage of containerized (including tanks) liquid and mobile solid Hazardous Materials and Fuels.

If the total quantity of an individual category of Hazardous Material stored or handled in a specific outdoor storage area does not exceed 25 percent of the quantity threshold for the material defined in Table 1, or 50 gallons of Fuel in any single tank or container, the requirements of this section do not apply to that functional area.

These requirements do not apply to underground storage tanks.

3.5.1 General Requirements

3.5.1.1 Hazardous Materials

3.5.1.1.1 Exterior Storage of Liquid Hazardous Materials in Containers

Hazardous Materials Control Approach
Store containers of Hazardous Materials in impervious containment, under a roof or other appropriate cover, or in a building. If a storage area is to be used on-site for less than 30 days, a portable temporary secondary system like that shown in Diagram 3.5 can be used in lieu of a permanent system as described above.

Facilities that have exterior storage of liquid Hazardous Materials in containers in excess of the material quantity thresholds in Table 1 shall follow the requirements below.

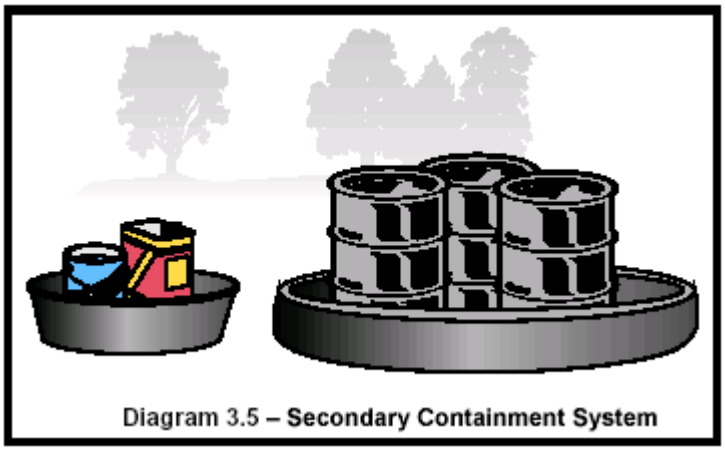

Diagram 3.5 – Secondary Containment System

Required Operational BMPs

1. Place tight-fitting lids on all containers.
2. Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
3. 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.
4. Businesses storing containers of Hazardous Materials that do not contain free liquids need only to store them in a sloped designated area with the containers elevated or otherwise protected from stormwater run-on.
5. 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 (see Diagram 3.6).
6. Storage of reactive, ignitable, or flammable liquids must comply with the Oregon Fire Code.

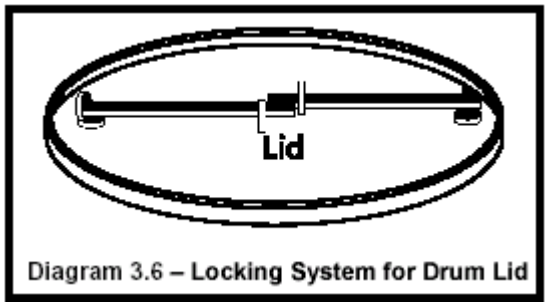

Diagram 3.6 – Locking System for Drum Lid

Required Structural Source Control BMPs

1. Keep containers of Hazardous Materials liquids inside a building unless this is impracticable due to site constraints or Oregon Fire Code requirements.
2. Store containers in a designated area, which is covered, bermed or diked, paved and impervious in order to contain leaks and spills (see Diagram 3.7). 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 as an "applicable structural source control BMP," provided that all the additional requirements of Section 3.5.2 that are applicable to the storage area are satisfied.]
3. For liquid Hazardous Materials, surround the containers with a dike as illustrated in Diagram 3.7. 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.

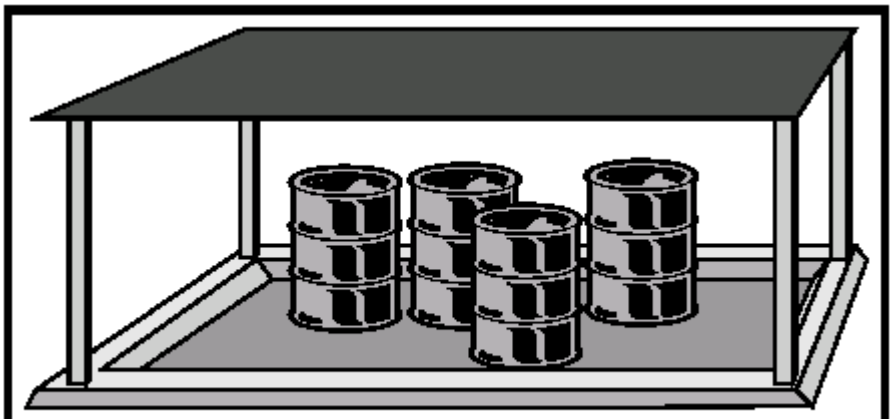

Diagram 3.7 – **Covered and Bermed Containment Area**

4. Where material is temporarily stored in drums, a containment system can be used as illustrated, in lieu of the above system (see Diagram 3.5).
5. 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 Diagram 3.8).

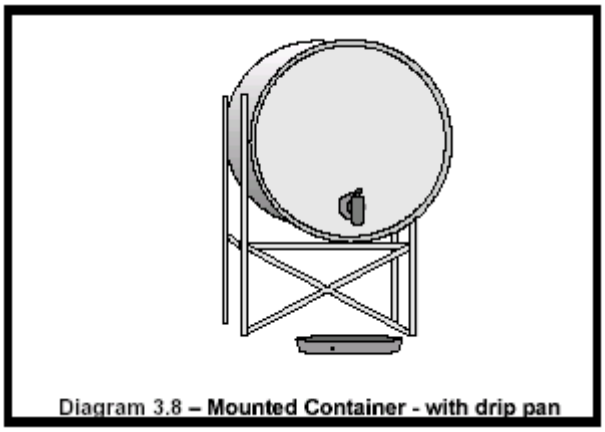

Diagram 3.8 – **Mounted Container - with drip pan**

3.5.1.1.2 Exterior Storage of Liquid Hazardous Materials in Tanks

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.*

Facilities that have exterior storage of liquid Hazardous Materials in tanks in excess of the material quantity thresholds in Table 1 shall follow the requirements below.

Required Operational BMPs
1. Inspect the tank containment areas regularly to identify problem components such as fittings, pipe connections, and valves, for leaks/spills, cracks, corrosion, etc.
2. 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.
3. Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
4. All installations shall comply with the Oregon Fire Code and the National Electric Code.

Required Structural Source Control BMPs
1. Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes as illustrated in Diagram 3.9, 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.
2. Slope the secondary containment to drain to a dead-end sump (optional), or equivalent, for the collection of small spills.
3. Include a tank overfill protection system to minimize the risk of spillage during loading.

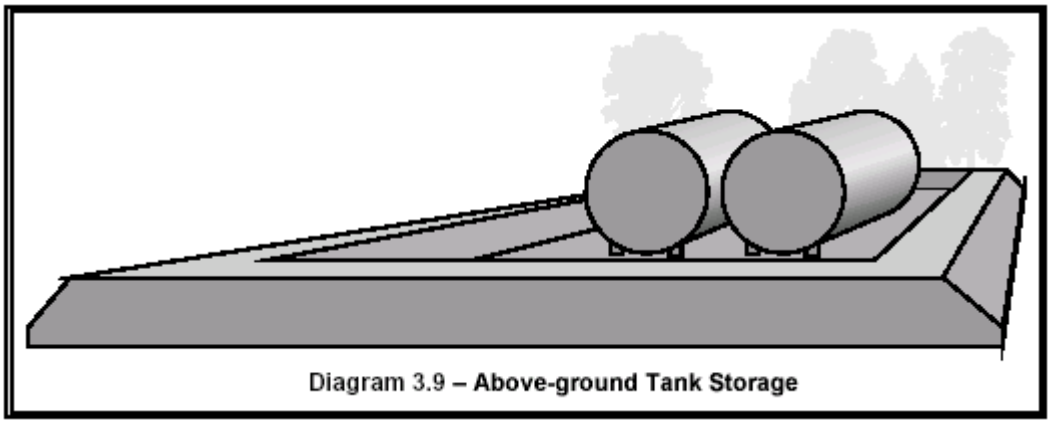

Diagram 3.9 – **Above-ground Tank Storage**

3.5.1.1.3 Exterior Storage of Mobile Solid Hazardous Materials

Hazardous Materials Control Approach
Provide impervious containment with berms, dikes, etc. and/or cover to prevent run-on and discharge of leachate Hazardous Material(s).

Facilities that have exterior storage of mobile solid Hazardous Materials in excess of the material quantity thresholds in Table 1 shall follow the requirements below.

Required Operational BMPs

1. Do not hose down the contained stockpile area to the ground, a storm drain or a conveyance to a storm drain, or to a receiving water.

Required Structural Source Control BMPs

Choose one or more of the source control BMP options listed below for stockpiles greater than 5 cubic yards of mobile solid Hazardous Materials:

1. Store in a building or paved and bermed covered area as shown in Diagram 3.10, or;

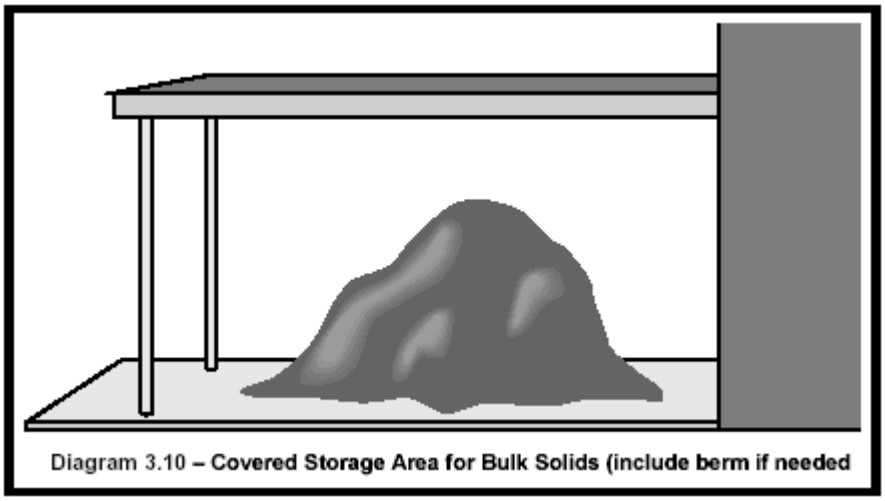

Diagram 3.10 – **Covered Storage Area for Bulk Solids (include berm if needed**

2. Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material as illustrated (see Diagram 3.11), or;

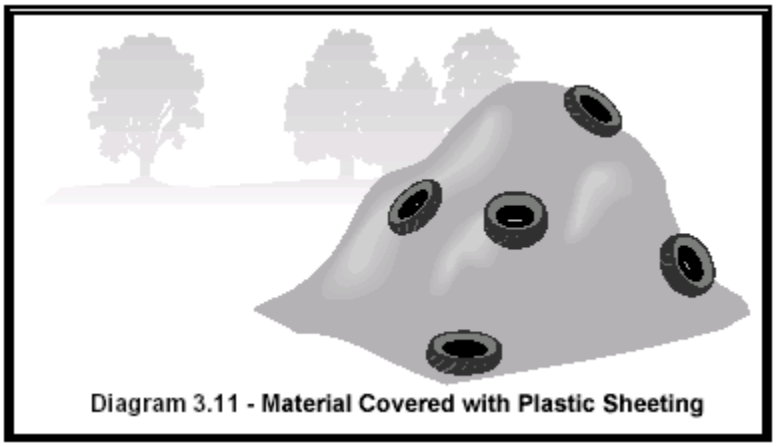

Diagram 3.11 - **Material Covered with Plastic Sheeting**

3. Pave the area and install a stormwater drainage system. Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater

(e.g., pooling) and leachable materials. Any new paving and/or stormwater drainage system will be subject to the requirements of the *Stormwater Management Manual* and the *Source Control Manual*.

4. For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material offsite or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without conveying through a treatment BMP.

3.5.1.2 Fuels

Except as noted below, facilities that store Fuels outdoors in containers or tanks with individual capacities greater than 50 gallons shall follow Section 3.5.1.1 and Section 3.5.2, as applicable, to the individual functional area.

Facilities that store Fuels in accordance with plans or programs implemented pursuant to other prevailing local, state, or federal regulations such as a Spill Prevention Control and Countermeasures (SPCC) plan, a Stormwater Pollution Control Plan (SWPCP), a Hazardous Materials Management Plan (HMMP), or a Hazardous Waste Contingency Plan, shall be deemed to be in conformance with the requirements of this section, provided the facility's plan or program addresses Fuels stored in any single container or tank with individual capacities greater than 50 gallons.

[Advisory Note: Outdoor Fuel storage areas might be subject to requirements imposed by the Oregon Fire Code, as adopted by the City. Facilities are directed to that reference to determine applicable requirements. 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 that document to determine potential applicability requirements.]

3.5.2 Additional Requirements

[Advisory Note: New, reconstructed, and significantly modified facilities located within the City of Portland might also be subject to 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 that document to determine potential applicability requirements.]

Containment
Areas with exposed dispensing hoses or fixtures associated with double-walled container or tank systems require 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. Proper signage and maintenance of the isolation equipment shall be an integral part of the system. (Note: downstream of the containment or isolation device, the conveyance system does not have to be impervious, e.g., it can be a vegetated swale).

Cover
Liquid storage tanks are not required to be covered with a canopy or roof. 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 of.

Pavement and Coatings
A paved storage area is required unless otherwise approved by the City. The paved area shall be sized to adequately cover the area intended for storage.

Some materials can react with asphalt pavement and deteriorate its integrity. It is therefore preferable to pave the area with Portland cement concrete. If the area is already paved with asphalt, an asphalt sealant should be applied to the pavement surface. The floor materials and sealant must be compatible with the material being stored. Whichever paving material is used, the paved surface should be properly maintained to prevent gaps and cracks.

When an exception to the requirement is allowed, the stored material shall still be raised off the ground by pallets or similar methods, with provisions for spill control.

Drainage
All paved storage areas shall be hydraulically isolated through grading, berms, or drains to prevent uncontaminated stormwater run-on to a storage area.

Covered storage areas with containment
Significant amounts of precipitation are not expected to accumulate in covered storage areas, and drainage facilities are not required for the contained area beneath the cover. If drainage facilities are installed, the drainage from the hydraulically isolated area shall be directed to an approved sanitary sewer, sump, catch basin, or other containment device, stored for proper disposition, or transferred to an authorized pretreatment facility.

Uncovered storage areas with containment
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

3.5.3 Recommended Operational or Structural Source Control BMPs

Covered storage areas should generally not be equipped with a drain system, but rather a blind sump or other means of collecting and transferring any accumulated liquids. If a covered storage area is equipped with drain lines, they should be equipped with a shut-off valve or other means of isolation such as drain cover. Valves should be kept in the closed position at all times.

The cover for an exterior materials storage area should have a minimum overhang of 3 feet on each side for covers 10 feet high or less. The cover should have a minimum overhang of 5 feet on each side for covers more than 10 feet high. The overhang should be measured relative to the containment, berm or other hydraulic barrier beneath the cover.

Maintain drainage areas in and around storage of mobile solid Hazardous Materials with a minimum slope of 1.5 percent to prevent pooling and minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter where it can be collected, or to internal drainage "alleyways" where material is not stockpiled. If and when feasible, collect and recycle water-soluble materials (leachates) to the stockpile. Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers near the storage area.

3.6 Transportation Routes (Or Access Roads)

"Transportation Routes" shall be defined as:

- All private property areas used or planned to be used to transport hazardous materials onto, within and off of a site including but not limited to driveways, drive aisles, parking lots, maneuvering areas, and rail lines.
- All public streets located in commercial or industrial land use zones, and freight rail lines.
- All public streets located in residential land use zones that serve as collectors or arterials. Local traffic streets in residential zones are exempt from the requirements of this section.

Sections 3.6.1, 3.6.2, and 3.6.3 are *Recommended* operational or structural source control BMPs for the transportation of Fuel but are not *Required* BMPs.

This section also applies to the public transportation system, including rail lines that may be used by motor carrier or other common means of transporting Hazardous Materials to and from a facility located within the regulated groundwater protection area shown in Figure 1.

Reconstruction of existing transportation routes as a result of a development permit application shall be subject to the requirements of this section, where practicable.

3.6.1 General Requirements

Pavement
All Hazardous Material transportation routes, except rail lines, shall be paved with impervious material.

Drainage collection system
Transportation corridors shall be completed with curbs and gutters, berm systems, or the drainage area shall be sloped and graded in a manner to convey spilled materials to a containment area, or be designed to hold such materials in that area until they can be removed

Drainage conveyance system.
A drainage conveyance system consists of the conduits which collect runoff from the Hazardous Material transportation route (and, also, possibly the storage, unloading/loading and process areas). If the transportation route contains a drainage conveyance system, it shall be constructed of impervious materials, including any open channels.

3.6.2 Additional Requirements

Spill containment
Containment of a spill shall be provided through a quick-closing valve, other shut-off device, or other methods (such as drain covers, diking material, sorbent booms, spill kits, etc.) to isolate spilled materials within the conveyance system that handles runoff, or by containing the spilled material prior to reaching the conveyance system. Proper signage and maintenance of the isolation equipment shall be an integral part of the system. (Note: downstream of the containment, the conveyance system does not have to be impervious, e.g., it can be a vegetated swale).

All transportation corridor drainage shall be routed through imperviously lined systems, lined open channels, or through unlined channels preceded by appropriate spill control structures with a minimum volume of 150 gallons and associated valve structures as close as practicable to the point of collection. Containment volume may be provided by treatment facilities, oversized piping, or paved areas. In instances where geomembrane liners are required, liners must be composed of textured High Density Polyethylene (HDPE) with a minimum thickness of 40 mils, installed in a manner designed to minimize leakage and punctures or other damage to the liner. See Appendix C for detailed specifications.

Facilities may also satisfy this requirement by providing secondary containment of Hazardous Materials within or on the transport vehicle itself (e.g., transporting materials to the facility in double-walled tanks, totes, or containers, transporting materials inside containment pallets, or transporting materials inside DOT-approved overpack containers, etc.).

3.6.3 Recommended Operational or Structural Source Control BMPs

This section contains *Recommended* operational or structural source control BMPs for the transportation of Hazardous Materials.

- A spill control separator or multi-chambered oil/water treatment device may be used to satisfy the requirements for both the transportation corridors and paved surfaces/parking areas. Oil/water treatment devices used for spill containment purposes should be equipped with a shut-off mechanism immediately downstream. The valve should be well marked and in good working order, and employees should be trained in spill response procedures.

- Spill containment that will be integrated into the site stormwater quality/quantity systems should be constructed with a quick-closing valve and lined forebay that precede the stormwater facility. The forebay and piping system should be designed to capture 150 gallons. In addition, a valve or other shut-off device should be placed between the forebay and the treatment facility to isolate any spilled materials. The valve should be well marked and placed in a location that can be accessed easily and safely in an emergency situation and should be in good working order. Employees should be trained in spill response procedures.

- Seal joints and cracks with a bonded epoxy or similar material.

3.6.4 Residential Zone Exemption

A property owner subject to regulation under Section 3.6 and that would be required to make street improvements under this section, may petition for an exemption from such requirement if the street in question is within a residential zone as designated by local zoning code. The exemption may be granted upon a showing by the petitioner that the street segment that would otherwise require improvements to the standard set by Section 3.6 of the Wellhead Protection Manual is wholly within a residential zone as defined by the local zoning code currently in effect and that the street is neither a transportation route for hazardous materials nor at high risk of hazardous material spills.

The petition shall take the form of a letter and be submitted to the governing City.

In Portland:
Portland Water Bureau
Program Manager, Groundwater Protection Program
1120 SW Fifth Ave, 6th Floor, Portland, OR, 97204.

In Gresham:
City of Gresham
Department of Environmental Services
1333 NW Eastman Parkway
Gresham, OR 97030

In Fairview:
City of Fairview
Public Works Department
P.O. Box 337
Fairview, OR 97024

The petition shall include the following:

a) A statement that an exemption is being requested.
b) A statement that the petitioner is the owner of the property(ies) that is (are) the subject of the petition, or that the petitioner is acting on behalf of the owner. If there are joint owners, they must all be signatories to the petition or other evidence must be provided that an owner or agent is acting on behalf of all owners of the property(ies).
c) The address(es) of the property(ies) adjacent to the street that are the subject of the petition.
d) A current zoning map showing that the property(ies) and street are within a residential zone.
e) A description of the action taken by the owner or other person that has triggered or will trigger the application of Section 3.6 of the Wellhead Protection Manual requirement for street improvements.
f) Any other information the petitioner believes may assist in the review of the petition, such as information on adjacent street conditions, presence or absence of commercial trucks on the street segment in question, and related information.

The City may request additional information from the petitioner to be submitted in writing to the City and made part of the petition.

The City will bring the petition before the Wellhead Protection Coordination Group, consisting of staff from the Cities of Gresham, Fairview and Portland and the Columbia Corridor Association. The Wellhead Protection Coordination Group will review the petition and make a recommendation to the City either 1)

granting, 2) granting with conditions, or 3) denying the petition. The recommendation will be provided to the City within 30 days of the submission of a complete petition, or within 30 days of the receipt of additional requested information, whichever is later. The City may require up to 45 additional days to review the petition. The City will have the final decision on the petition and will provide the decision in writing explaining the basis for the decision, including any conditions. The appeal process for any decision is based on the policies and procedures of the City reviewing the petition.

3.7 Fuel Dispensing Facilities

The requirements in this section apply to facilities where vehicles, equipment, or tanks are refueled on the premises from stationary fueling equipment—whether a large-sized gas station, a single-pump maintenance yard, or a small-sized fuel tank.

A Fuel dispensing facility is defined as the area where Fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers (including fuel islands, above or below-ground fuel tanks, fuel pumps, and the surrounding pad). Propane, liquefied natural gas, and natural gas fueling facilities and tanks are exempt from the requirements of Section 3.7.

3.7.1 General Requirements

Hazardous Materials Control Approach
Fueling facilities must be constructed on an impervious concrete pad under a roof to keep out rainfall and stormwater run-on. A treatment BMP must be used for contaminated stormwater and wastewaters in the fueling containment area.

New or substantially remodeled[5] Fueling Stations within the ***City of Portland*** must be constructed in accordance with Section 1.8 of the *Source Control Manual*, published by the Bureau of Environmental Services.

Facilities with Fuel dispensing operations or areas shall follow the guidelines below.

3.7.1.1 Required Operational BMPs

1. Prepare an emergency spill response and cleanup plan and have designated trained person(s) available either on site or on call at all times to promptly and properly implement that plan and immediately cleanup all spills. Keep suitable cleanup materials, such as dry adsorbent materials, on site to allow prompt cleanup of a spill.
2. Train employees on the proper use of fuel dispensers. Post signs in accordance with the Oregon Fire Code. Post "No Topping Off" signs (topping off gas tanks causes spillage and vents gas fumes to the air). Make sure that the automatic shutoff on the fuel nozzle is functioning properly.
3. The person conducting the fuel transfer must be present at the fueling pump during fuel transfer, particularly at unattended or self-serve stations.
4. Keep drained oil filters in a suitable container or drum.

[5] Substantial remodeling includes replacing the canopy, or relocating or adding one or more fuel dispensers in such a way that the Portland cement concrete (or equivalent) paving in the fueling area is modified.

3.7.1.2 Required Structural Source Control BMPs

1. Design the fueling island to control spills (dead-end sump or spill control separator in compliance with the Oregon Fire Code, OFC), and to treat collected stormwater and/or wastewater to required levels. Slope the concrete containment pad around the fueling island toward drains; either trench drains, catch basins and/or a dead-end sump. The slope of the drains shall not be less than 1 percent (Sections 5703.4 and 5004.2 of the OFC). Drains to treatment shall have a shutoff valve, which must be closed in the event of a spill. The spill control sump must be sized in compliance with Sections 5703.4 and 5004.2 of the OFC; or
2. Design the fueling island as a spill containment pad with a sill or berm raised to a minimum of four inches (Sections 5703.4 and 5004.2 of the OFC) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. Raised sills are not required at the open-grate trenches that connect to an approved drainage-control system.
3. The fueling pad must be paved with Portland cement concrete, or equivalent. Asphalt is not considered an equivalent material.
4. The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad (see Diagram 3.12). The roof or canopy should, at a minimum, cover the spill containment pad (within the grade break or fuel dispensing area) and preferably extend several additional feet to reduce the introduction of windblown rain. Convey all roof drains to storm drains outside the fueling containment area.

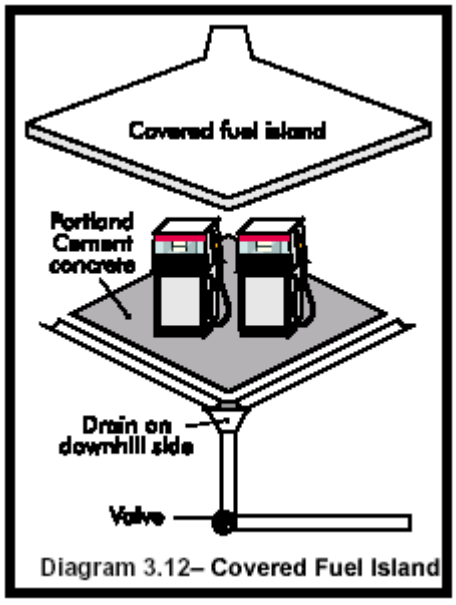

Diagram 3.12– Covered Fuel Island

5. Stormwater collected on the fuel island containment pad must be conveyed to a sanitary sewer system, if approved by the City; or to an approved treatment system such as an oil/water separator and a basic treatment BMP. (Basic treatment BMPs include, but are not limited to, media filters and biofilters) Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain greater than 10 milligrams per liter (mg/L) of oil and grease.
6. Alternatively, stormwater collected on the fuel island containment pad may be collected and held for proper offsite disposal.
7. Conveyance of any fuel-contaminated stormwater to a sanitary sewer must be approved by the City and must comply with pretreatment regulations.

8. Transfer the fuel from the delivery tank trucks to the fuel storage tank in impervious contained areas and ensure that appropriate overflow protection is used. Alternatively, cover nearby storm drains during the filling process and use drip pans under all hose connections.

3.7.1.3 Requirements for Vehicles 10 feet in Height or Greater

A roof or canopy may not be practicable at fueling stations that regularly fuel vehicles that are 10 feet in height or greater, particularly at industrial sites. At those types of fueling facilities, the following BMPs apply, as well as the applicable BMPs and fire prevention (OFC requirements) of this BMP for fueling stations:

1. If a roof or canopy is impractical the concrete fueling pad must be equipped with emergency spill control, which includes a shutoff valve for the drainage from the fueling area. The valve must be closed in the event of a spill. An electronically actuated valve is preferred to minimize the time lapse between spill and containment. Spills must be immediately cleaned up and properly disposed off-site.
2. The valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the City, or to oil removal treatment such as an API or CP oil/water separator, catch basin insert, or equivalent treatment, and then to a basic treatment BMP. Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain greater than 10 mg/L of oil and grease.
3. An explosive or flammable mixture is defined under state and federal pretreatment regulations, based on a flash point determination of the mixture. If contaminated stormwater is determined not to be explosive or) then it could be conveyed to a sanitary sewer system.

3.7.2 Additional Requirements

The following additional requirements apply to facilities with Fuel dispensing operations or areas:

Signage
Signage shall be provided at the Fuel dispensing area and shall be plainly visible from all fueling activity areas. In addition to the signage required pursuant to Section 3.7.1 or the Oregon Fire Code as adopted by the City, the following additional signage shall be provided at the Fuel dispensing area that is plainly visible and water resistant, and includes the following information:

Safety precautions
Immediate spill response procedures
Emergency contacts and telephone numbers

Shut-Off Valve
A shut-off valve, other shut-off device, or other methods of isolating the fueling pad (such as drain covers, diking material, sorbent booms, etc.) shall be installed downstream of the fueling pad, before the domestic waste line tie-in.

3.7.3 Recommended Operational or Structural BMPs

Not Applicable.

3.8 Storage, Maintenance, and Repair of Vehicles and Equipment

This section applies to facilities that engage in the onsite maintenance and repair of vehicles and equipment and facilities engaged in non-exempt uses (b)(ii) or (b)(iii) defined in Section 1.4.4.

3.8.1 General Requirements

Hazardous Materials Control Approach
Control of leaks and spills of fluids using good housekeeping, and cover and containment BMPs.

3.8.1.1 Onsite Maintenance and Repair of Vehicles and Equipment, and Other Non-exempt Uses

Facilities that engage in the onsite maintenance and repair of vehicles and equipment and facilities engaged in non-exempt uses (b)(ii) or (b)(iii) defined in Section 1.4.4, shall follow the requirements below. Facilities engaged in non-exempt uses (b)(ii) or (b)(iii) defined in Section 1.4.4 may alternatively comply with Section 3.6.1 (Transportation Routes - General Requirements) in lieu of the BMPs referenced in this Section.

3.8.1.2 Required Operational BMPs

1. Inspect for leaks all incoming vehicles, parts, and equipment stored temporarily outside.
2. 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.
3. Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
4. Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.
5. Do not pour/convey washwater, liquid waste, or other Hazardous Materials into storm drains or to surface water. Check with the local sanitary sewer authority for approval to convey to a sanitary sewer.
6. Do not connect maintenance and repair shop floor drains to storm drains or to surface water. To allow for snowmelt during the winter a drainage trench with a sump for particulate collection can be installed and used only for draining the snowmelt and not for discharging any vehicular or shop Hazardous Materials.
7. 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.
8. Do not hose down the area to a storm drain or to a receiving water. Sweep parking lots, storage areas, and driveways, regularly to collect dirt, waste, and debris.

3.8.1.3 Required Structural Source Control BMPs

1. Conduct 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 and runoff of contaminated stormwater.
2. 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.
3. Park large mobile equipment, such as log stackers, in a designated contained area.

3.8.2 Additional Requirements

Not Applicable.

3.8.3 Recommended Operational or Structural BMPs

For facilities engaged in non-exempt uses (b)(ii) or (b)(iii) defined in Section 1.4.4 that choose to comply with Section 3.8.1 in lieu of Section 3.6.1, Section 3.6.3 contains *recommended* operational or structural source control BMPs for these activities.

The following operational practices are *recommended* for all facilities covered by Section 3.8:

1. Consider storing damaged vehicles inside a building or other covered containment, until all liquids are removed. Remove liquids from vehicles retired for scrap.
2. Clean parts with aqueous detergent based solutions or non-chlorinated solvents such as kerosene or high flash mineral spirits, and/or use wire brushing or sand blasting whenever practicable. Avoid using toxic liquid cleaners such as methylene chloride, 1,1,1-trichloroethane, trichloroethylene or similar chlorinated solvents. Choose cleaning agents that can be recycled.
3. Inspect all BMPs regularly, particularly after a significant storm. Identify and correct deficiencies to ensure that the BMPs are functioning as intended.
4. Avoid hosing down work areas. Use dry methods for cleaning leaked fluids.
5. Recycle greases, used oil, oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic fluids, transmission fluids, and engine oils.
6. Do not mix dissimilar or incompatible waste liquids stored for recycling.

3.9 Training Requirements

Facility owners, operators, or tenants[6] who exceed the regulated material threshold amounts defined in Section 1.3 (Table 1) are required to annually provide awareness training to personnel who handle Hazardous Materials or Fuels.

Facility owners, operators, or tenants shall develop a training program or amend an existing program (see Section 3.1.1) that informs personnel of the possible risks to the WHPA associated with the handling/managing Hazardous Materials or Fuels at their facility. The training provided must address or cover the following:

a. The location of the facility within the WHPA,
b. Where to find material safety data sheets (MSDS) at the facility,
c. Overview of how to read the information contained on a MSDS,
d. The name and contact information of facility personnel who are to be notified in the event of a release of Hazardous Materials or Fuels,
e. Personnel with direct responsibility for responding to a release of Hazardous Materials or Fuels at the facility shall also receive training in the following areas or topics:
    (1) Review of the most recent Hazardous Materials Inventory Report submitted in accordance with Section 5.1,
    (2) Review of the most recent Facility Information Report submitted in accordance with Section 5.2,
    (3) Overview of the potential risks that spilled Hazardous Materials or Fuels may pose to the well field, and
    (4) Review of response procedures that will be followed in the event of a release of Hazardous Materials or Fuels.

Facility owners, operators, or tenants shall maintain a copy of the training materials and a written log of personnel who have completed the annual training for 3 years following completion of the training.

[6] For non-owner operated facilities, the training and recordkeeping obligations of this section are the responsibility of the facility operator or tenant.

3.10 Public Underground Injection Controls for the City of Portland (UIC)

Note: This Section is only applicable within the portion of the Wellhead Protection Area located within the City of Portland.

Public UIC: A public UIC is any underground injection control system regulated under Oregon Administrative Rules Chapter 340, Division 44 (OAR 340-044), and is designed to collect stormwater drainage from publicly owned rights of way or adjacent properties draining into publicly owned rights of way.

Retrofitting for Public UICs
Standard design for City of Portland public UICs currently includes a sedimentation manhole and sump. Within the WHPA, public UICs installed without a sedimentation manhole shall be retrofitted to include a sedimentation manhole or other appropriate stormwater treatment facility if the UIC receives drainage from the following areas:

- Industrial or commercially zoned areas
- Arterials or residential collector streets as defined by the Portland Office of Transportation's Transportation System Plan (2002).

The schedule for the completion of these upgrades required retrofit completion by June 30, 2008.

Maintenance Plan
Maintenance of sedimentation manholes and other spill containment devices will be conducted such that all are maintained to prevent sediment accumulation that adversely impacts the functioning of the device, making it unable to meet the requirements of the manual. Sediment accumulation within the sedimentation manholes will be monitored and cleaning schedules will be adapted to maintain the functionality of the manholes.

New and Existing UICs: New and existing UICs not elsewhere addressed in this Section shall comply with Oregon Administrative Rules Chapter 340, Division 44 (OAR 340-044).

3.11 Alternative Measures in Specific Cases

Facilities that store hazardous materials that are not deemed halogenated solvents listed in Appendix A, for 30 days or less during transport in IMO or ISO tank containers that meet United States Department of Transportation (USDOT) hazardous materials standards and do not remove, transfer, load, unload, or use the materials from the containers may propose to the Water Bureau the use of structural or operational source control measures different than, and alternative to, those specified in Sections 3.2 through 3.8 of this Manual.

The Water Bureau Administrator may approve the request to use alternative measures if the Administrator determines that, by using USDOT-approved containers in conjunction with the proposed alternative facility measures, the facility will achieve a level of well field protection equivalent to or greater than the level of well field protection that would be provided by use of the measures specified in the Manual alone. In all instances, however, the facility shall employ the required operational source controls specified in Section 3.1.4 of this Manual. In all instances the USDOT approved containers must be in good functional condition.

The request to use alternative measures for situations described above shall be submitted in writing to the City.

In Portland:
Portland Water Bureau
Program Manager, Groundwater Protection Program
1120 SW Fifth Ave, 6th Floor, Portland, OR, 97204.

In Gresham:
City of Gresham
Department of Environmental Services
1333 NW Eastman Parkway
Gresham, OR 97030

In Fairview:
City of Fairview
Public Works Department
P.O. Box 337
Fairview, OR 97024

The submittal shall detail what alternative measures are proposed and demonstrate how the alternative measures will achieve a level of well field protection equivalent to or greater than the level of protection that would be provided by use of the measures specified in the Manual.

The City may request additional information from the petitioner to be submitted in writing to the City and made part of the petition.

The City will bring the submittal request before the Wellhead Protection Coordination Group, consisting of staff from the Cities of Gresham, Fairview and Portland and the Columbia Corridor Association. The Wellhead Protection Coordination Group will review the submittal and make a recommendation to the City either 1) granting, 2) granting with conditions, or 3) denying the petition. The recommendation will be provided to the City within 30 days of the submission of a complete submittal, or within 30 days of the receipt of additional requested information, whichever is later. The City may require up to 45 additional days to review the submittal. The City will have the final decision on the submittal request and will provide the decision in writing explaining the basis for the decision, including any conditions. The appeal process for any decision is based on the policies and procedures of the City reviewing the submittal request.

Section 4 Operation and Maintenance Activities

4.1 General Recommendation

Preparation of an Operations and Maintenance (O&M) Plan is recommended. An O&M Plan helps assure optimum performance of the containment devices and minimizes the potential for spills, leaks and other sources of Hazardous Materials or Fuels. An O&M Plan should include at least the following elements:

- Scope of activities;
- Schedule for inspection and maintenance; and
- Parties responsible for inspecting.

Though an O&M Plan is not required by the WHPP, facilities are cautioned that a number of existing regulatory programs require the development of plans that define operation, maintenance, prevention, preparedness, and emergency instructions that may be applicable to a facility, including:

- Spill Prevention Control and Countermeasures Plan (SPCC) prepared in accordance with 40 CFR 112;
- Contingency Plan prepared in accordance with 40 CFR 264 or 265;
- Storm Water Pollution Control Plan (SWPCP) prepared in accordance with 40 CFR 122;
- Hazardous Materials Management Plan (HMMP) prepared in accordance with Section 5001.5.1 of the Oregon Fire Code; or
- Other O&M, Hazardous Material or Fuel response plan(s) prepared in accordance with local, state, or federal regulations

4.2 Additional Recommendations

- **Impervious surfaces**. Monitor conditions yearly to ensure that the surface is in good condition. Any cracks should be repaired and reapplication of sealants should be considered.
- **Gates and valves**. Test yearly to ensure that moving parts are functional and that there is a complete range of functional movement.
- **Signage**. Ensure that the sign can be read and that the information provided is accurate and up to date.

Section 5 Reporting Requirements

Facility owners, operators, or tenants[7] who exceed the regulated material threshold amounts defined in Section 1.3 (Table 1) are required to annually provide the following reports to the City.

5.1 Annual Hazardous Material Inventory Report[8]

If a facility stores or uses Hazardous Materials, Petroleum Products, or Fuels that exceed the threshold amounts defined in Table 1, the facility shall annually submit to the City the following regulated material inventory information:

- Product name
- Hazardous component(s)
- Chemical Abstract Service (CAS) number for hazardous component(s)
- Location where stored or used
- Amount on site, in storage and in use
- Hazardous Material category under Section 1.3 (Table 1)

All reported information must be certified to be true and accurate by a facility representative. Facilities may satisfy this requirement by updating, as necessary, and/or certifying the information submitted to the City in the previous reporting year. Facilities shall submit this information to the City by January 31 of each year.

5.2 Facility Information Report

In addition to the annual Hazardous Material Inventory Report, facilities shall also submit a site plan, map, or drawing with the following information with its submittal to the City:

- Location of functional area(s) used for Hazardous Materials or Fuels,
- On-site Hazardous Material transportation route(s),
- Locations of storm drains and drainage area boundary lines,
- Locations of dry wells or sumps used for subsurface disposal of stormwater or wastewater,
- Location and description of any device(s) to stop or contain spills from leaving the site (e.g., control valves), and
- Location of emergency spill containment and cleanup kit(s)

Facilities may satisfy this submittal requirement by furnishing appropriately referenced information from a completed Hazardous Materials Management Plan (as required by some facilities to comply with Section 5001.5.1 of the Oregon Fire Code), a Storm Water Pollution Control Plan (to satisfy the 1200-COLS NPDES permit), an SPCC plan prepared in accordance with 40 CFR 112, or a Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 or 265.

Facilities shall provide this information with the annual Hazardous Material Inventory Report required in Section 5.1. If the information required in this section has not changed in the previous 12 months, the facility may submit a declaration to the City that the previous submittal remains current.

[7] For non-owner operated facilities, the reporting obligation is the responsibility of the facility operator or tenant.
[8] For the purposes of this section only, the Hazardous Material Inventory Report shall include Hazardous Materials, Petroleum Products, and Fuels defined in Section 1.3.1 and 1.3.2 that exceed the threshold quantities given in Table 1.

Appendix A
Halogenated Solvents List

Appendix A Halogenated Solvent List (Alpha Sort)			
Solvent	**Synonym**	**CAS No.**	**Specific Density (g/cc)**
Benzyl chloride	Chloromethylbenzene	100-44-7	1.100
Bis(2-chloroethyl)ether	Bis(-chloroehtyl)ether	111-44-4	1.220
Bis(2-chloroisopropyl)ether	Bis(-chloroisopropyl)ether	108-60-1	1.103
Bromobenzene	Phenyl bromide	108-86-1	1.495
Bromochloromehtane	Chlorobromomethane	74-97-5	1.934
Bromodichloromethane	Dichlorobromomethane	75-27-4	1.980
Bromoethane	Ethyl bromide	74-96-4	1.460
Bromoform	Tribromomethane	75-25-2	2.890
Carbon tetrachloride	Tetrachloromethane	56-23-5	1.594
Chlorobenzene	Benzene chloride	108-90-7	1.106
2-Chloroethyl vinyl ether	(2-Chlorethoxy)ethene	110-75-8	1.048
Chloroform	Trichloromethane	67-66-3	1.483
1-Chloro-1-nitropropane	Chloronitropropane	600-25-9	1.209
2-Chlorophenol	o-Chlorophenol	95-57-8	1.263
4-Chlorophenyl phenyl ether	p-Chlorodiphenyl ether	7005-72-3	1.203
Chloropicrin	Trichloronitromethane	76-06-2	1.656
m-Chlorotoluene		108-41-8	1.072
o-Chlorotoluene	2-Chloro-1-methylbenzene	95-45-8	1.082
p-Chlorotoluene		106-43-4	1.066
Dibromochloromethane	Chlorodibromomethane	124-48-1	2.451
1,2-Dibromo-3-chlorpropane	DPCP	96-12-8	2.050
Dibromodifluoromethane	Freon 12-B2	75-61-6	2.297
1,2-Dichlorobenzene	o-Dichlorobenzene	95-50-1	1.305
1,3-Dichlorobenzene	m-Dichlorobenzene	541-73-1	1.288
1,1-Dichloroethane	1,1-DCA	75-34-3	1.176
1,2-Dichloroethane	Ethylene dichloride; 1,2-DCA	107-06-2	1.235
1,1-Dichloroethene	Vinylidene chloride; 1,1-DCE	75-35-4	1.218
trans-1,2-Dichloroethene	trans-1.2-DCE:	156-60-5	1.257
1,2-Dichloropropane	Propylene dichloride	78-87-5	1.560
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	10061-01-5	1.224
trans-1.3-Dichloropropene	trans-1,3-Dichlonopropylene	10061-02-0	1.182
Ethylene dibromide	1,2-Dibromoethane; EDB	106-93-4	2.179
Hexachlorobutadiene	HCBD	87-68-3	1.554
Hexachlorocyclopentadiene	HCCPD	77-47-4	1.702
Methylene chloride	Dichloromethane	75-09-2	1.327
Pentachloroethane	Ethane pentachloride	76-01-7	1.680
1,1,2,2-Tetrabromoethane	Acetylene tetrabromide	79-27-6	2.875
1.1,2,2-Tetrachloroethane	Acetylene tetrachloride	79-34-5	1.595
Tetrachloroethene	Perchlororethylene; PCE	127-18-4	1.623
1,2,4-Tetrachlorobenzene	1,2,4-TCB	120-82-1	1.454
1,1,1-Trichloroethane	Methyl chloroform; 1,1,1-TCA	71-55-6	1.339
1,1,2-Trichloroethane	1,1,2-TCA	79-00-5	1.440
Trichloroethene	TCE	79-01-6	1.464
1,1,2-Trichlorofluoromethane	Freon 11	75-69-4	1.487
1,2,3-Trichloropropane	Allyl trichloride	96-18-4	1.389
1,1,2-Trichlorotrifluoroethane	Freon 113	76-13-1	1.564

Appendix A Halogenated Solvent List (Chemical Abstracts Registry Service, CAS Sort)			
Solvent	**Synonym**	**CAS No.**	**Specific Density (g/cc)**
Carbon tetrachloride	Tetrachloromethane	56-23-5	1.594
Chloroform	Trichloromethane	67-66-3	1.483
1,1,1-Trichloroethane	Methyl chloroform; 1,1,1-TCA	71-55-6	1.339
Bromoethane	Ethyl bromide	74-96-4	1.460
Bromochloromehtane	Chlorobromomethane	74-97-5	1.934
Methylene chloride	Dichloromethane	75-09-2	1.327
Bromodichloromethane	Dichlorobromomethane	75-27-4	1.980
Bromoform	Tribromomethane	75-25-2	2.890
1,1-Dichloroethane	1,1-DCA	75-34-3	1.176
1,1-Dichloroethene	Vinylidene chloride; 1,1-DCE	75-35-4	1.218
Dibromodifluoromethane	Freon 12-B2	75-61-6	2.297
1,1,2-Trichlorofluoromethane	Freon 11	75-69-4	1.487
Pentachloroethane	Ethane pentachloride	76-01-7	1.680
Chloropicrin	Trichloronitromethane	76-06-2	1.656
1,1,2-Trichlorotrifluoroethane	Freon 113	76-13-1	1.564
Hexachlorocyclopentadiene	HCCPD	77-47-4	1.702
1,2-Dichloropropane	Propylene dichloride	78-87-5	1.560
1,1,2-Trichloroethane	1,1,2-TCA	79-00-5	1.440
Trichloroethene	TCE	79-01-6	1.464
1,1,2,2-Tetrabromoethane	Acetylene tetrabromide	79-27-6	2.875
1.1,2,2-Tetrachloroethane	Acetylene tetrachloride	79-34-5	1.595
Hexachlorobutadiene	HCBD	87-68-3	1.554
o-Chlorotoluene	2-Chloro-1-methylbenzene	95-45-8	1.082
1,2-Dichlorobenzene	o-Dichlorobenzene	95-50-1	1.305
2-Chlorophenol	o-Chlorophenol	95-57-8	1.263
1,2-Dibromo-3-chlorpropane	DPCP	96-12-8	2.050
1,2,3-Trichloropropane	Allyl trichloride	96-18-4	1.389
Benzyl chloride	Chloromethylbenzene	100-44-7	1.100
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Ethylene dibromide	1,2-Dibromoethane; EDB	106-93-4	2.179
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Bis(2-chloroethyl)ether	Bis(-chloroehtyl)ether	111-44-4	1.220
1,2,4-Tetrachlorobenzene	1,2,4-TCB	120-82-1	1.454
Dibromochloromethane	Chlorodibromomethane	124-48-1	2.451
Tetrachloroethene	Perchlororethylene; PCE	127-18-4	1.623
trans-1,2-Dichloroethene	trans-1.2-DCE:	156-60-5	1.257
1,3-Dichlorobenzene	m-Dichlorobenzene	541-73-1	1.288
1-Chloro-1-nitropropane	Chloronitropropane	600-25-9	1.209
4-Chlorophenyl phenyl ether	p-Chlorodiphenyl ether	7005-72-3	1.203
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	10061-01-5	1.224
trans-1.3-Dichloropropene	trans-1,3-Dichlonopropylene	10061-02-0	1.182

Appendix B
US EPA Chemical "List of Lists"
http://www2.epa.gov/epcra/epcracerclacaa-ss112r-consolidated-list-lists-march-2015-version

All appendices can be found on the City of Portland's website:
www.portlandonline.com/water/index.cfm?c=29880

Appendix C
Polyethylene Geomembrane Swale Liner Specifications

POLYETHYLENE GEOMEMBRANE SWALE LINER SPECIFICATIONS

PART 1 GENERAL

1.01 GEOMEMBRANE PROPERTIES

A. Material shall be 40-mil High Density Polyethylene (HDPE) geomembrane, textured on both sides or approved equal. An experienced firm regularly engaged in manufacturing textured HDPE shall manufacture the geomembrane.

B. HDPE Resin

Resin shall be new, first quality, compounded and manufactured specifically for producing geomembrane.

C. HDPE Sheet

1. Shall meet the following standards for textured 40-mil HDPE:

TESTED PROPERTY	**TEST METHOD**	**MIN. VALUE**
Thickness, (minimum average) mil (mm)	ASTM D 5994	38 (0.96)
Lowest individual for 8 out of 10 values		36 (0.91)
Lowest individual for any of the 10 values		34 (0.86)
Density, lb/ft^3 (g/cm^3)	ASTM D 1505	58.68 (0.94)
Tensile Properties (each direction)	ASTM D 6693, Type IV	
Strength at Break, lb/in-width (N/mm)	Dumbell, 2 ipm	60 (11)
Strength at Yield, lb/in-width (N/mm)		84 (15)
Elongation at Break, %	G.L. = 2.0 in (51 mm)	100
Elongation at Yield, %	G.L. = 1.3 in (33 mm)	12
Tear Resistance, lb (N)	ASTM D 1004	28 (125)
Puncture Resistance, lb (N)	ASTM D 4833	60 (267)
Carbon Black Content, %	ASTM D 1603	2.0

Shall not exceed a combined maximum total 1 percent by weight additives other than carbon black.

Shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

Shall be supplied in roll form. Each roll is to be identified with labels indicating roll number, thickness, length, width and MANUFACTURER.

1.02 GEOMEMBRANE DEPLOYMENT

A. Prior to installing the geomembrane, the CONTRACTOR shall inspect the sub-grade, remove all foreign matter and sharp, protruding or loose material that could penetrate or otherwise damage the geomembrane, and compact the sub-grade to specifications.

B. During installation, the CONTRACTOR shall visually inspect the geomembrane for imperfections, defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The CONTRACTOR shall mark and repair faulty or suspect areas.

C. All cuts, welds and penetrations shall be performed per MANUFACTURER'S specifications. Shingled overlaps shall be a minimum of three feet in the downslope direction.

D. Cover fill material shall be free of foreign objects or sharp material that could penetrate or otherwise damage the geomembrane, and shall be placed and spread over the geomembrane by the CONTRACTOR in a manner that prevents punctures or other damage to the geomembrane.

END OF SECTION