

# APPENDIX C CITY OF RENTON AQUIFER PROTECTION REGULATIONS

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Following are selected Renton Municipal Code (RMC) sections that present the main requirements for development and construction in Aquifer Protection Areas. Universal sections such as permit procedures are not repeated here.

## 4-3-050 Critical Areas Regulations

### *H. AQUIFER PROTECTION:*

1. Applicability: The aquifer protection regulations apply to uses, activities, and facilities located within an aquifer protection area (APA) as classified below.

a. Aquifer Protection Area (APA): Aquifer protection areas are the portion of an aquifer within the zone of capture and recharge area for a well or well field owned or operated by the City, as depicted in Subsection Q.1 of this Section, Maps.

b. Aquifer Protection Zones: Zones of an APA are designated to provide graduated levels of aquifer protection. Zone boundaries are determined using best available science documented in the City of Renton Wellhead Protection Plan, an appendix of the City of Renton Water System Plan, as periodically updated. The following zones may be designated:

i. Zone 1: The land area situated between a well or well field owned by the City and the three hundred sixty five (365) day groundwater travel time contour.

ii. Zone 1 Modified: The same land area described for Zone 1 but for the purpose of protecting a high-priority well, well field, or spring withdrawing from an aquifer that is partially protected by overlying geologic strata. Uses, activities, and facilities located in this area are regulated as if located within Zone 1 except as provided by C.6(a)(iii) of this section.

iii. Zone 2: The land area situated between the three hundred sixty five (365) day groundwater travel time contour and the boundary of the zone of potential capture for a well or well field owned or operated by the City. If the aquifer supplying water to a well, well field, or spring is naturally protected by overlying geologic strata, the City may choose not to subdivide an APA into two (2) zones. In such a case, the entire APA will be designated as Zone 2.

c. Mapping:

i. Determination of Location within a Zone of an Aquifer Protection Area: In determining the location of facilities within the zones defined by Subsection Q.1 of this Section, the following rules shall apply.

(a) Facilities located wholly within an APA zone shall be governed by the restrictions applicable to that zone.

(b) Facilities having parts lying within more than one zone of an APA shall be governed as follows: Each part of the facility shall be reviewed and regulated by the requirements set forth in this Section for the zone in which that part of the facility is actually located.

(c) Facilities having parts lying both in and out of an APA shall be governed as follows:

That portion which is within an APA shall be governed by the applicable restrictions in this Section; and

That portion which is not in an APA shall not be governed by this Section.

ii. Zone Maps: The locations of aquifer protection areas (APA) in the City are depicted by the map in Subsection Q.1 of this Section, Maps.

d. Performance Standards: In addition to the general standards of Subsection E of this Section, the following performance standards, Subsections H2 to H10, apply to all non-exempt uses, activities, and facilities on sites located within an aquifer protection area per Subsection H1, Applicability.

e. Authority to Require Hydrogeologic Assessment: The City may require an applicant to prepare a hydrogeologic study if the proposal has the potential to significantly impact groundwater quantity or quality, and sufficient information is not readily available. Such a report shall be prepared by a qualified professional at the applicant's expense. Report content requirements may be specified by the City in accordance with state or federal guidelines or tailored to the particular development application. Peer review of the applicant's report may be required in accordance with Subsection F.7 of this Section.

## 2. Facilities:

### a. Removal of Existing Facilities – Zone 1:

i. The storage, handling, use, treatment or production of hazardous materials in aggregate quantities greater than five hundred (500) gallons shall not be allowed within Zone 1 of an APA after October 14, 2002. The storage, handling, use, treatment or production of tetrachloroethylene (e.g., dry-cleaning fluid) shall not be allowed within Zone 1 of an APA after March 31, 1999.

ii. Once a facility in Zone 1 is closed, relocated, or the use of hazardous materials is terminated, reinstatement of the use of hazardous materials on the site in quantities greater than that allowed for new facilities locating in Zone 1 as described in Subsection C.8.e(ii), Prohibited Activities, Zone 1, shall be prohibited.

iii. Closure of a facility or termination of any or all facility activities shall be conducted in accordance with the closure requirements in RMC 4-9-015.F, Closure Permit.

### b. Existing Facilities Change in Quantities – Zone 1: In Zone 1 of an APA, no change in operations at a facility shall be allowed that increases the aggregate quantity of

hazardous materials stored, handled, treated, used, or produced with the following exception: The aggregate quantity of hazardous materials may be increased not to exceed 500 gallons.

c. Existing Facilities – Allowances in Zone 2: The storage, handling, treatment, use or production of hazardous materials at existing facilities shall be allowed within Zone 2 of an APA upon compliance with the provisions of this Section.

d. Requirements for Facilities – Zones 1 and 2: The following conditions in Subsections H.2.d(i) to (vi) of this Section will be required as part of any operating permit issued for facilities in Zone 1 of an APA. Conditions in Subsections H.2.d(i) to (v) shall apply to facilities in Zone 2 of an APA.

i. Secondary Containment – Zones 1 and 2:

(a) Materials Stored in Tanks subject to DOE – Zones 1 and 2: Hazardous materials stored in tanks that are subject to regulation by the Washington Department of Ecology under chapter 173-360 WAC are exempt from containment requirements in Subsection H.2.d(i) of this Section, Secondary Containment – Zones 1 and 2, but are subject to applicable requirements in RMC 4-5-120, Underground Storage Tank Secondary Containment Regulations.

(b) Secondary Containment Devices and Requirements – Zones 1 and 2: Every owner of a facility shall provide secondary containment devices adequate in size to contain on-site any unauthorized release of hazardous materials from any area where these substances are either stored, handled, treated, used, or produced. Secondary containment devices shall prevent hazardous materials from contacting soil, surface water, and groundwater and shall prevent hazardous materials from entering storm drains and, except for authorized and permitted discharges, the sanitary sewer. Design requirements for secondary containment devices are as follows:

(1) The secondary containment device shall be large enough to contain the volume of the primary container in cases where a single container is used to store, handle, treat, use, or produce a hazardous material. In cases where multiple containers are used, the secondary containment device shall be large enough to contain the volume of the largest container. Volumes specified are in addition to the design flow rate of the automatic fire extinguishing system, if present, to which the secondary containment device is subjected. The secondary containment device shall be capable of containing the fire flow for a period of twenty (20) minutes or more.

(2) All secondary containment devices shall be constructed of materials of sufficient thickness, density, and composition to prevent structural weakening of the containment device as a result of contact with any hazardous material. If coatings are used to provide chemical resistance for secondary containment devices, they shall also be resistant to the expected

abrasion and impact conditions. Secondary containment devices shall be capable of containing any unauthorized release for at least the maximum anticipated period sufficient to allow detection and removal of the release.

(3) Hazardous materials stored outdoors and their attendant secondary containment devices shall be covered to preclude precipitation with the exception of hazardous materials stored in tanks that have been approved by and are under permit from the City of Renton Fire Prevention Bureau. Secondary containment for such tanks, if uncovered, shall be able to accommodate the volume of precipitation that could enter the containment device during a twenty four (24) hour, twenty five (25) year storm, in addition to the volume of the hazardous material stored in the tank. Storage of hazardous materials, both indoors and outdoors, shall, at all times, meet both the requirements of this Section and the Uniform Fire Code.

(4) Secondary containment devices shall include monitoring procedures or technology capable of detecting the presence of a hazardous material within twenty four (24) hours following a release. Hazardous materials shall be removed from the secondary containment device within twenty four (24) hours of detection and shall be legally stored or disposed.

(5) Areas in which there are floor drains, catchbasins, or other conveyance piping that does not discharge into a secondary containment device that meets the requirements of this Chapter shall not be used for secondary containment of hazardous materials. Closure of existing piping shall be according to procedures and designs approved by the Department.

(6) Primary containers shall be impervious to the contents stored therein, properly labeled, and fitted with a tight cover which is kept closed except when substances are being withdrawn or used.

(7) Hazardous materials stored outdoors when the facility is left unsupervised must be inaccessible to the public. Such techniques as locked storage sheds, locked fencing, or other techniques may be used if they will effectively preclude access.

(8) Stored hazardous materials shall be protected and secured, as needed, against impact and earthquake to prevent damage to the primary container that would result in release of hazardous materials that would escape the secondary containment area.

ii. Hazardous Material Monitoring Requirements for Existing Facilities – Zones 1 and 2:

(a) The owners of all existing facilities shall implement hazardous materials monitoring.

(b) All hazardous material monitoring activities shall include the following:

(1) A written routine monitoring procedure which includes, when applicable: the frequency of performing the monitoring method, the methods and equipment to be used for performing the monitoring, the location(s) from which the monitoring will be performed, the name(s) or title(s) of the person(s) responsible for performing the monitoring and/or maintaining the equipment, and the reporting format.

(2) Written records of all monitoring performed shall be maintained on-site by the operator for a period of three (3) years from the date the monitoring was performed. The Department may require the submittal of the monitoring records or a summary at a frequency that the Department may establish. The written records of all monitoring performed in the past three (3) years shall be shown to the Department upon demand during any site inspection. Monitoring records shall include but not be limited to:

- The date and time of all monitoring or sampling;
- Monitoring equipment calibration and maintenance records;
- The results of any visual observations;
- The results of all sample analysis performed in the laboratory or in the field, including laboratory data sheets;
- The logs of all readings of gauges or other monitoring equipment, groundwater elevations or other test results; and
- The results of inventory readings and reconciliations.

(3) Visual monitoring must be implemented unless it is determined by the Department to be infeasible to visually monitor.

(c) On every day of operation, a responsible person designated by the permittee shall check for breakage or leakage of any container holding hazardous materials. Electronic sensing devices approved by the Department may be employed as part of the inspection process, provided that the system is checked daily for malfunctions.

iii. Emergency Collection Devices – Zones 1 and 2: Vacuum suction devices, absorbent scavenger materials, or other devices approved by the Department shall be present on site (or available within an hour by contract with a cleanup company approved by the Department), in sufficient quantity to control and collect the total quantity of hazardous materials plus absorbent material. The presence of such emergency collection devices and/or cleanup contract are the responsibility and at the expense of the owner and shall be documented in the operating permit.

iv. Inspection of Containment and Emergency Equipment – Zones 1 and 2: Owners shall establish procedures for monthly in-house inspection and routine maintenance of containment and emergency equipment. Such procedures shall be in writing, a regular checklist and schedule of maintenance activity shall be established, and a log

shall be kept of inspections and maintenance activities. Such logs and records shall be made available at all reasonable times to the Department for examination.

v. Employee Training – Zones 1 and 2: Operators shall schedule training for all new employees upon hiring and once per year thereafter to explain the conditions of the operating permit such as emergency response procedures, proper hazardous waste disposal, monitoring and reporting requirements, record keeping requirements, and the types and quantities of hazardous materials on site. These training sessions will be documented and recorded and the names of those in attendance will be recorded. These records shall be made available at all reasonable times to the Department for inspection.

vi. Additional Facility Requirements for Zone 1: Owners shall complete the following:

(a) Site Monitoring: For facilities located in Zone 1 of an APA, an owner of a facility may, at their own expense, be required to institute a program to monitor groundwater, surface water runoff, and/or site soils. The Department may require that the owner of a facility install one or more groundwater monitoring wells in a manner approved by the Department in order to accommodate the required groundwater monitoring. Criteria used to determine the need for site monitoring shall include, but not be limited to, the proximity of the facility to the City's production or monitoring wells, the type and quantity of hazardous materials on site, and whether or not the hazardous materials are stored in underground vessels.

Every owner required to monitor groundwater, surface water runoff, and/or soils shall perform such monitoring semi-annually and obtain independent analytical results of the presence and concentration of those chemicals requiring monitoring (including breakdown and transformation products) as identified by the Department in the operating permit. The analytical results shall be obtained through the use of Department of Ecology-approved methods for water and/or soils. The results shall be filed within ten (10) days with the Department.

If a facility is required to perform site monitoring pursuant to Subsection H.2.d(vi) of this Section, Additional Facility Requirements for Zone 1, Site Monitoring, then a site monitoring plan will be required. This plan must indicate procedures to be followed to assess groundwater, surface water runoff, and/or soil for concentrations of those chemicals requiring monitoring as identified by the Department in the operating permit. If a groundwater monitoring program is in effect per the requirements of 40 CFR 264 or 265, and this program includes all of the chemicals identified in the operating permit, then it shall be incorporated into the site monitoring plan which shall also include provisions to address the groundwater monitoring requirements of Subsection H.2.d(vi) of this Section, Additional Facility Requirements for Zone 1, Site Monitoring, and RMC 4-9-015.G.3, Unauthorized Releases, Monitoring Results.

(b) Site Improvements:

(1) For facilities located in Zone 1 of an APA, the owner may be required to pave all currently unpaved areas of their facility that are subject to any vehicular use or storage, use, handling, or production of hazardous materials.

(2) For those facilities located in Zone 1 of an APA in which the nature of the business involves the use of hazardous materials outside of fully enclosed structures, the City shall evaluate the existing stormwater collection and conveyance system, and reserves the right to require the owner to upgrade the system to meet the provisions of RMC 4-6-030.E.3, Additional Requirements in Aquifer Protection Areas – Amendments to King County Surface Water Design Manual.

(3) For those facilities located in Zone 1 of an APA, the City may require the owner to test interior wastewater plumbing and the building side sewer for tightness according to Subsection H.6.a(ii), Pipeline Requirements – Zone 1, and reserves the right to require that such wastewater conveyance be repaired or replaced according to Subsection H.6.a(i), Pipeline Requirements – Zone 1.

(c) Capital Cost Reimbursement for Additional Operating Permit Requirements: The City shall pay fifty percent (50%) of documented capital costs up to twenty five thousand dollars (\$25,000.00) for required installation and construction of monitoring wells, site paving, wastewater conveyance, and stormwater improvements as required in Subsections H.2.d(vi)(a) and (b), Site Monitoring and Site Improvements. Payment by the City shall be made according to adopted administrative rules.

3. Use of Pesticides and Nitrates – APA Zones 1 and 2:

a. Use of Pesticides: The application of hazardous materials such as pesticides shall be allowed in an APA, except within one hundred feet (100') of a well or two hundred feet (200') of a spring, provided that:

i. The application is in strict conformity with the use requirements as set forth by the EPA and as indicated on the containers in which the substances are sold.

ii. Persons who are required to keep pesticide application records by RCW 17.21.100.1 and WAC 16-228-190 shall provide a copy of the required records to the Department within seventy two (72) hours of the application.

b. Nitrate-Containing Materials: The application of fertilizers containing nitrates shall be allowed in an APA except within one hundred feet (100') of a well or two hundred feet (200') of a spring; provided, that:

i. No application of nitrate-containing materials shall exceed one-half (0.5) pound of nitrogen per one thousand (1,000) square feet per single application and a total yearly application of five (5) pounds of nitrogen per one thousand (1,000) square

feet; except that an approved slow-release nitrogen may be applied in quantities of up to nine-tenths (0.9) pound of nitrogen per one thousand (1,000) square feet per single application and eight (8) pounds of nitrogen per one thousand (1,000) square feet per year; and

ii. Persons who apply fertilizer containing nitrates to more than one contiguous acre of land located in the APA either in one or multiple application(s) per year shall provide to the Department within seventy two (72) hours of any application the following information:

- (a) The name, address, and telephone number of the person applying the fertilizer;
- (b) The location and land area of the application;
- (c) The date and time of the application;
- (d) The product name and formulation;
- (e) The application rate.

4. Wastewater Disposal Requirements – Zones 1 and 2: Refer to RMC 4-6-040J, Sanitary Sewer Standards, Additional Requirements that Apply within Zones 1 and 2 of an Aquifer Protection Area.

5. Surface Water Requirements – Zones 1 and 2: Refer to RMC 4-6-030E, Drainage Plan Requirements and Methods of Analysis for additional surface water requirements applicable within Zones 1 and 2 of an Aquifer Protection Area.

6. Pipeline Requirements:

a. Pipeline Requirements – Zone 1:

i. All new and existing pipelines in Zone 1 shall be constructed or repaired in accordance with material specifications contained in Subsection S of this Section, Pipeline Material. All existing product pipelines in Zone 1 shall be repaired and maintained in accordance with BMPs and best available technology.

ii. All new pipelines constructed in Zone 1 shall be tested for leakage in conformance with the following provisions prior to being placed into service.

(a) Pipeline leakage testing shall be conducted in accordance with best available technology, to the satisfaction of the Department.

(b) Pipeline leakage testing methods shall be submitted to the Department for review prior to testing and shall include: a detailed description of the testing methods and technical assumptions; accuracy and precision of the test; proposed testing durations, pressures, and lengths of pipeline to be tested; and scale drawings of the pipeline(s) to be tested.

(c) Upon completion of testing, pipeline leakage testing results shall be submitted to the Department and shall include: record of testing durations, pressures, and lengths of pipeline tested; and weather conditions at the time of testing.

(d) Routine leakage testing of new pipelines constructed in Zone 1 may be required by the Department.

iii. If the Department has reason to believe that the operation or proposed operation of an existing pipeline in Zone 1 of an APA may degrade groundwater quality, the Department may require leakage testing of the existing pipeline in accordance with Subsection H.6.a(ii) of this Section; and installation, sampling, and sample analysis of monitoring wells. Routine leakage testing of existing pipelines in Zone 1 may be required by the Department. Criteria for this determination is specified under Subsection D.2.b(ii), Potential to Degrade Groundwater – Zone 2, Criteria.

iv. Should pipeline leakage testing reveal any leakage at any level then the Department shall require immediate repairs to the pipeline to the satisfaction of the Department such that no infiltration of water into the pipeline or exfiltration of substances conveyed in the pipeline shall occur. Any repairs which are made shall be tested for leakage pursuant to Subsection H.6.a(ii) of this Section.

b. Pipeline Requirements – Zone 2: If the Department has reason to believe that the operation or proposed operation of an existing pipeline in Zone 2 of an APA may degrade groundwater quality, the Department may require: leakage testing in accordance with Subsection H.6.a(ii) of this Section; installation, sampling, and sample analysis of groundwater monitoring wells; repair of the pipeline to the satisfaction of the Department such that degradation of groundwater quality is minimized or eliminated. Criteria for this determination is specified under Subsection D.2.b(ii), Potential to Degrade Groundwater – Zone 2, Criteria.

7. Construction Activity Standards – Zones 1 and 2: Refer to RMC 4-4-030.C.8, Construction Activity Standards – APA Zones 1 and 2.

8. Fill Material Requirements – Zones 1 and 2: Refer to RMC 4-4-060L4, Fill Material, regarding quality of fill and fill material source statement requirements within aquifer protection areas.

9. Regulations for Existing Solid Waste Landfills – Zones 1 and 2:

a. Materials: Earth materials used as fill or cover at a solid waste landfill shall meet the requirements of RMC 4-4-060L4, Fill Material.

b. Groundwater Monitoring: The Department shall have the authority to require an owner of a solid waste landfill to implement a groundwater monitoring program equal to that described by King County Board of Health Title 10 (King County Solid Waste Regulations) Section 10.72.020 and a corrective action program equal to that described by Section 10.72.030. The Department shall have the authority ascribed to the health officer in said regulations. Quarterly reports shall be provided to the Department detailing groundwater monitoring activity during the preceding three (3) months.

Reports detailing corrective action required by the Department shall be submitted according to a written schedule approved by the Department.

10. Hazardous Materials – Release Restrictions – Zones 1 and 2: Hazardous materials shall not be spilled, leaked, emitted, discharged, disposed, or allowed to escape or leach into the air, into groundwater, surface water, surface soils or subsurface soils. Exception: Intentional withdrawals of hazardous materials for the purpose of legitimate sale, use, or disposal and discharges permitted under federal, state, or local law. Any unauthorized releases shall be subject to the procedural requirements of RMC 4-9-015G, Unauthorized Releases.

*R. GENERIC HAZARDOUS MATERIALS LIST:*

GENERIC HAZARDOUS MATERIALS LIST FOR INFORMATIONAL USE ONLY

Acid and basic cleaning solutions

Antifreeze and coolants

Arsenic and arsenic compounds

Battery acid

Bleaches, peroxides

Brake and transmission fluids

Brine solution

Casting and foundry chemicals

Caulking agents and sealants

Cleaning solvents

Cooling water (not isolated from process chemicals)

Corrosion and rust prevention solutions

Cutting fluids

Degreasing solvents

Deicing materials

Disinfectants

Dyes

Electroplating solutions

Engraving solutions

Etching solutions

Explosives

Fertilizers

Food processing wastes  
Formaldehyde  
Fuels and additives  
Glues, adhesives, and resins  
Greases  
Hydraulic fluid  
Indicators  
Industrial and commercial janitorial supplies  
Industrial sludges and stillbottoms  
Inks, printing, and photocopying chemicals  
Laboratory chemicals  
Medical, pharmaceutical, dental, veterinary, and hospital solutions  
Metal dusts  
Mercury and mercury compounds  
Metals finishing solutions  
Oils  
Paints, pigments, primers, thinners, dyes, stains, wood preservatives, varnishing, and cleaning compounds  
Painting solvents  
PCBs  
Pesticides and herbicides  
Plastic resins, plasticizers, and catalysts  
Photo development chemicals  
Poisons  
Polishes  
Pool chemicals  
Processed dust and particulates  
Radioactive sources  
Reagents and standards  
Refrigerants  
Roofing chemicals and sealers

Sanitizers, disinfectants, bactericides, and algacides

Soaps, detergents and surfactants

Solders and fluxes

Stripping compounds

Tanning industry chemicals

Transformer and capacitor oils/fluids

Wastewater treatment sludges

(Ord. 4851, 8-7-2000)

**S. PIPELINE MATERIAL:**

1. PIPELINE MATERIAL REQUIREMENT								
Pipe Material	Pipe Diameter in Inches						Suggested Material Spec	Considerations (See Subsection S2)
	<4	4-8	10-12	14-20	24-30	36-54		
Ductile Iron, Rubber Gaskets Cement Mortar-Lined Polyethylene-Lined		1,2	1,2	1,2	1,2	1,2	AWWA C151, C104 AWWA C151	abcdnopr abcdnopr
Ductile Iron, Nitrile Gaskets Cement Mortar-Lined Polyethylene-Lined		1,2	1,2	1,2	1,2	1,2	AWWA C151, C104 AWWA C151	bcdinopr bcdeinopr
PVC, Rubber Gasket Joints CL 150 or 200 SDR 35	1,2 1	1,2 1	1,2				AWWA C900 ASTM D3034 AWWA C900	abjlnoprt bijlnoprt
PVC, Nitrile Gasket Joints CL 150 or 200			1,2,3	1,2,3				
PVC, Solvent Welded Joints Sch 80	2,3	1,2,3	1,2,3				ASTM D1784, D1785	hijklnoprt
Welded Steel, Rubber Gaskets Cement Mortar-Lined Dielectric-Lined					1,2 1,2	1,2 1,2	AWWA C200, C205 AWWA C200, C210	abfghnopr abfghnopr
Welded Steel, Welded Joints Cement Mortar-Lined Dielectric-Lined		1,2	1,2	1,2	1,2 1,2,3	1,2 1,2,3	AWWA C200, C205 AWWA C200, C210	fghnopr fghnopr
High Density Polyethylene Pipe Corrugated High Density Polyethylene Pipe - Smooth Interior		1,2 1	1,2 1	1,2 1	1,2 1	1 1	ASTM D1248 and D3350 ASTM D1248 and AASHTO	hkpqu kpqsu
Slip Form Liner		4,5	4,5	4,5	4,5	4,5	ASTM D638	mnoqr
<b>PIPELINE SERVICE</b> 1. Storm Sewer 2. Sanitary Sewer and Side Sewer 3. Leachate Pipeline								

1. PIPELINE MATERIAL REQUIREMENT							
Pipe Material	Pipe Diameter in Inches					Suggested Material Spec	Considerations (See Subsection S2)
	<4	4-8	10-12	14-20	24-30		
4. Rehab Existing Storm Sewer							
5. Rehab Existing Sanitary Sewer							

2. CONSIDERATIONS ON SELECTION OF PIPE MATERIALS
The Utility maintains a list of materials meeting performance standards. Other materials meeting similar performance standards or developed as the result of new technology may be approved by the Utility.
a. Rubber gaskets may be severely damaged by petroleum products, particularly in prolonged exposures to concentrated flows containing little or no stormwater or sanitary sewage. In cases where heavy concentrations of petroleum products may be experienced, nitrile (Nitrile-Butadiene; i.e., NBR) gaskets should be used.
b. Gasketed joints may not be leak-proof at zero or low pressures, if improperly installed.
c. Mechanical joints may be less likely to leak at low pressures than push-on joints.
d. May need protective coatings and/or cathodic protection against external corrosion.
e. Considered most reliable gasket and lining material for ductile iron leachate pipeline.
f. Very difficult to repair linings on inside of joints in pipe smaller than 24-inch diameter.
g. Almost always needs protective coatings and cathodic protection against external corrosion.
h. Properly made joints are considered leak-proof.
i. Nitrile gaskets may require long delivery time.
j. Requires special attention to bedding and backfill depth to avoid structural failure of pipe.
k. Large thermal expansion coefficient. May need to limit solvent welded joints to 4-inch and smaller pipe. May require careful evaluation of pipe installation temperature and temperature of piped liquids to ensure joint integrity.
l. Pipe not available over 12-inch diameter.
m. Slip form lining is available in 6-inch through 60-inch diameter for almost any pressure, if sufficient pipe cross sectional-area is available.
n. Pressure grouts and gels are not acceptable for rehabilitation or patching of storm and sanitary sewers.
o. Suitability of pipe lining and gasket material to resist chemical attack by conveyed fluids must be determined for each pipeline service considered.
p. All storm and sanitary sewer manholes, catch basins, and inlets should be equipped with precast concrete bottom and sidewalls with rubber gasketed joints between sections, water-tight epoxy grout or other approved pipe entrances through walls, and approved waterproof coating of all interior floor and wall surfaces. Manholes, catch basins, and inlets should have no leakage when hydrostatically tested at atmospheric pressure.
q. Has good resistance to a number of chemicals, petroleum products, and hydrogen sulfide corrosion.
r. "Zero leakage" test requirement may be impossible to achieve under the best conditions for any pipe materials because trapped air may distort test results, even in a drop-tight pipe. Pressure and leakage test requirements should consider whether the pipe has steep slope or will stand full of liquid. Pipelines should be tested with the intent to prevent or minimize leakage. Air testing should not be allowed; hydrostatic testing should be as stringent as any found in the industry. Pipe materials, without regard for chemical attack, corrosion, or puncture, are generally ranked as follows, in decreasing order of liquid-tight reliability: welded steel with welded joints PVC with solvent welded joints slip form liner

<b>2. CONSIDERATIONS ON SELECTION OF PIPE MATERIALS</b>
ductile iron with viton or rubber gaskets welded steel with rubber gasketed joints PVC with viton or rubber gasketed joints
s. Joints should consist of "heat-shrink" wrap, standard corrugated coupling, and full pipe band clamps.
t. The use of PVC may be restricted by other Utility policy in regards to depth of pipe cover.
u. HDPE may be adversely affected by solvents; its use is not recommended where contact with solvents may occur.

(Ord. 4851, 8-7-2000)

**4-4-030C8, Construction Activity Standards – APA Zones 1 and 2.**

**C. CONSTRUCTION STANDARDS:**

8. Construction Activity Standards – Aquifer Protection Area (APA) Zones 1 and 2: The following standards shall apply to construction activities occurring in the Aquifer Protection Area if construction vehicles will be refueled on site and/or the quantity of hazardous materials that will be stored, dispensed, used, and handled on the construction site, exclusive of the quantity of hazardous materials contained in fuel or fluid reservoirs of construction vehicles, will exceed twenty (20) gallons. Weight of solid hazardous materials will be converted to volumes for purposes of determining whether de minimus amount is exceeded. Ten (10) pounds shall be considered equal to one gallon.

- a. Designated Person: There shall be a designated person on site during operating hours who is responsible for supervising the use, storage, and handling of hazardous materials and who shall take appropriate mitigating actions necessary in the event of fire or spill.
- b. Secondary Containment: Hazardous material storage, dispensing, and refueling areas and, to the extent possible, use and handling areas shall be provided with secondary containment in accordance with RMC 4-3-050H2d(i), Secondary Containment – Zones 1 and 2.
- c. Securing Hazardous Materials: Hazardous materials left on site when the site is unsupervised must be inaccessible to the public. Locked storage sheds, locked fencing, locked fuel tanks on construction vehicles, or other techniques may be used if they will preclude access.
- d. Removal of Leaking Vehicles and Equipment: Construction vehicles and stationary equipment that are found to be leaking fuel, hydraulic fluid, and/or other hazardous materials shall be removed from the site and the aquifer protection area or repaired in place as soon as possible and may remain on the site in the interim only if leakage is completely contained.
- e. Flammable and Combustible Liquids – Storage and Dispensing: Storage and dispensing of flammable and combustible liquids from tanks, containers, and tank vehicles into the fuel and fluid reservoirs of construction vehicles or stationary equipment on the construction site

shall be in accordance with these standards and the Uniform Fire Code Section 7904.2, as adopted or amended by the City.

f. Clean-Up Equipment and Supplies: Equipment and supplies adequate for the immediate clean-up of the worst case release shall be stored on the construction site in close proximity to hazardous materials.

g. Unauthorized Releases: Unauthorized releases as defined in RMC 4-11-210, Definitions U, shall immediately be contained, reported, and cleaned up as required by RMC 4-9-015G, Unauthorized Releases. Contaminated soil, water, and other materials shall be disposed of according to state and local requirements.

h. Application of Pesticides and Fertilizer: Application of pesticide and fertilizer shall be in accordance with the requirements of RMC 4-3-050H3, Use of Pesticides and Nitrates – APA Zones 1 and 2.

i. Hazardous Materials Management Statement: A hazardous materials management statement as described in RMC 4-8-120D8, Definitions H, Hazardous Materials Management Statement, shall be submitted to and approved by the Department prior to issuance of a permit regulating construction activity in the APA.

#### **RMC 4-4-060L4, Fill Material**

##### ***L. FILLS:***

4. Fill Material: Fill materials shall have no more than minor amounts of organic substances and shall have no rock or similar irreducible material with a maximum dimension greater than eight inches (8"). Fill material shall meet the following requirements:

a. Construction, Demolition, and Land Clearing Waste Prohibited: Fill material shall be free of construction, demolition, and land clearing waste except that this requirement does not preclude the use of recycled concrete rubble per Washington State Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction.

b. Cleanliness of Fill Material: Fill material shall not contain concentrations of contaminants that exceed cleanup standards for soil specified in WAC 173-340-740, Model Toxics Control Act.

c. Special Requirement for Projects Located in Zone 1 of the Aquifer Protection Area and Which Will Involve Placement of More than Fifty (50) Cubic Yards of Imported Fill: A source statement certified by a professional engineer or geologist licensed in the State of Washington shall be provided to the Department and shall be reviewed and accepted by the Department prior to stockpiling or grading imported fill at the project site. The source statement, as defined in RMC 4-8-120D19, shall be required for each source location from which imported fill will be obtained.

d. Special Requirement for Projects Located in Zone 2 of the Aquifer Protection Area and Which Will Involve Placement of More than One Hundred (100) Cubic Yards of Imported

Fill: The source statement described in RMC 4-8-120D19 is required for each source location from which imported fill will be obtained.

e. Abbreviated Source Statement for Aquifer Protection Area: The Department may accept a source statement, as defined in RMC 4-8-120D19, that does not include results of sampling and analysis of imported fill if a professional geologist or engineer licensed in the State of Washington certifies that the source location from which fill will be obtained has never been filled, developed, or subjected to use that could have introduced chemical contamination to the site.

f. Department Authority to Request Additional Information or Reject Certified Source Statement: The Department has the authority to request additional information regarding imported fill material and the source thereof and to reject a source statement or abbreviated source statement if they do not demonstrate that the fill material to be imported to a project site meets fill material standards in Subsections L4a and L4b of this Section and/or the Department has reason to suspect that the fill material could be contaminated. Such requests or rejections shall be made in writing to the applicant.

g. Source Statement Not Required for Imported Fill Obtained from Washington State Department of Transportation Approved Source: The source statement defined in RMC 4-8-120D19 is not required for those projects located in the aquifer protection area if documentation is provided that imported fill will be obtained from a Washington State Department of Transportation approved source. (Amd. Ord. 4851, 8-7-2000)

h. Sampling and Analysis Procedures: The licensed professional engineer or geologist or person under their supervision who samples earth materials to be used as imported fill, oversees analysis, and prepares the source statement required by Subsections L4c and L4d of this Section shall follow procedures specified in WAC 173-340-820 and 173-340-830 of the Model Toxics Control Act Cleanup Regulation.

i. Permittee Subject to Required Actions after Illegal Placement of Imported Fill: A permittee who stockpiles or grades imported fill at the site without Department review and acceptance of the source statement required by Subsections L4c and L4d of this Section or who stockpiles or grades fill at the site that does not meet the fill quality standards of Subsections L4a and L4b of this Section is subject to measures specified by the Department to reduce risk of contamination of the site due to illegal placement of fill. Such measures may include, but are not limited to, any or all of the following and shall be implemented at the permittee's expense:

- i. Provide the Department with the source statement defined in RMC 4-8-120D19 within a time-period specified by the Department;
- ii. Immediately cover fill with a waterproof cover;
- iii. Immediately remove fill;
- iv. Installation of monitoring wells and monitoring of groundwater quality;

v. Remediation of contamination of the site caused by the illegal placement of fill according to a schedule specified by the Department and in accordance with cleanup standards for soil and groundwater described in the Model Toxics Control Act Cleanup Regulation, chapter 173-340 WAC.

j. Department Authority to Conduct Independent Sampling and Analysis: The Department shall have the authority to enter on to private property to conduct independent sampling and analysis of fill. If the Department determines that fill does not meet fill quality standards of Subsections L4a and L4b of this Section, then it may require the permittee to accomplish any or all of the measures listed in Subsection L4i of this Section at his or her own expense.

k. Department Authority to Implement Removal and Remediation Measures: The Department or its authorized agents shall have the authority to implement measures listed in Subsection L4i of this Section if the permittee fails to accomplish such measures in a timely manner. The permittee shall be responsible for any costs incurred by the Department or its authorized agents in the conduct of such activities. (Amd. Ord. 4740, 7-19-1999; Ord. 4992, 12-9-2002)

## **RMC 4-6-030E, Drainage Plan Requirements and Methods of Analysis**

### ***E. DRAINAGE PLAN REQUIREMENTS AND METHODS OF ANALYSIS:***

1. Content: All persons applying for any of the permits and/or approvals contained in Subsection C1 of this Section shall provide a drainage plan for surface water flows entering, flowing within and leaving the subject property. The drainage plan and supportive calculation report(s) shall be stamped by a professional civil engineer registered in the state of Washington. The drainage plan shall be prepared in conformance with the Core and Special Requirements contained in sections 1.2 and 1.3 of chapter 1, the hydrologic analysis methods contained in chapter 3, the hydraulic analysis and design criteria in chapter 4, and the erosion/sedimentation control plan and practices contained in chapter 5 of the 1990 King County Surface Water Design Manual, except where amended or appended by the Department. (Ord. 4367, 9-14-1992; Amd. Ord. 4851, 8-7-2000)

2. Special Requirement #13; Aquifer Recharge and Protection Areas:

a. Threshold: If a proposed project lies within an Aquifer Recharge and/or Protection Area as defined and designed by City ordinance and as indicated on the Aquifer Recharge and Protection Map at the City Permit Counter.

b. Requirement: Then the proposed project drainage review and engineering plans shall be prepared in accordance with the special requirements, methods of analysis and design standards that have been adopted for aquifer recharge and protection areas by City ordinance.

3. Additional Requirements in Aquifer Protection Areas – Amendments to King County Surface Water Design Manual, Chapter 1: The following sections of chapter 1 of the 1990 King County Surface Water Design Manual (which has been incorporated in the Renton Municipal Code by

reference) is hereby amended to read as follows by adding additional requirements following the end of each section: (Amd. Ord. 4851, 8-7-2000)

a. Section 1.2.1, CORE REQUIREMENT #1: DISCHARGE AT THE NATURAL LOCATION:

i. Requirements that Apply within Zones 1 and 2 of an Aquifer Protection Area: Surface water and stormwater runoff from a proposed project that proposes to construct new, or modify existing drainage facilities must be discharged at the natural location so as not to be diverted onto, or away from, the adjacent downstream property, except that surface and storm runoff from new or existing impervious surfaces subject to vehicular use or storage of chemicals should be discharged at the location and in the manner which will provide the most protection to the aquifer, as directed and approved by the Stormwater Utility and the Water Utility.

ii. Discharge from the project must produce no significant adverse impact to the downhill property. Where no conveyance system exists at the adjacent downstream property line or other acceptable location and the discharge was previously unconcentrated flow, the runoff must:

Be conveyed across the downstream properties to an acceptable discharge point (see CORE REQUIREMENT #2; OFF-SITE ANALYSIS in § 1.2.2), with drainage easement secured from the downstream owners and recorded at the King County Office of Records and Elections prior to drainage plan approval, OR

Be discharged onto a rock pad shaped in a manner so as to disperse flow (see Figure 4.3.5I) if the runoff is less than 0.2 cfs runoff rate for the one hundred (100) year, twenty four (24) hour duration design storm event existing site conditions.

b. Section 1.2.3, CORE REQUIREMENT #3; RUNOFF CONTROL, "Biofiltration":

i. Requirements for Zone 1 of an Aquifer Protection Area: Proposed project runoff resulting from more than five thousand (5,000) square feet of impervious surface, and subject to vehicular use or storage of chemicals, shall not be treated prior to discharge from the project site by on-site biofiltration measures but shall instead be treated by a wet vault meeting the design criteria contained in § 1.3.5 SPECIAL REQUIREMENT #5; SPECIAL WATER QUALITY CONTROLS. New or existing retrofitted wet vaults and appurtenances shall meet the pipeline requirements specified in RMC 4-3-050H6a, Pipeline Requirements – Zone 1. (Amd. Ord. 4851, 8-7-2000)

ii. Requirements for Zone 2 of an Aquifer Protection Area: Proposed project runoff resulting from more than five thousand (5,000) square feet of impervious surface, and subject to vehicular use or storage of chemicals, shall be treated prior to discharge from the project site by on-site biofiltration measures as described in § 4.6.3 in Chapter 4 of the King County Surface Water Design Manual. Biofiltration facilities may require a liner per the design criteria described in the section Liner to Prevent Groundwater Contamination in the introduction to § 4.6, Water Quality Facility Design.

iii. The biofiltration design flow rate shall be based on the peak rate of runoff for the two (2) year, twenty four (24) hour duration design storm event total precipitation. Note,

biofiltration facilities installed following peak rate runoff control facilities may be sized to treat the allowable release rate (predeveloped) for the two (2) year, twenty four (24) hour duration design storm event for the peak rate runoff control facility. Biofiltration facilities installed prior to peak rate runoff control facilities shall be sized based on the developed conditions. (Amd. Ord. 4740, 7-19-1999)

c. Section 1.2.3, CORE REQUIREMENT #3; RUNOFF CONTROL, “Detention Facilities”:

i. Requirements for Zone 1 of an Aquifer Protection Area: The City of Renton prohibits the construction of new detention ponds to control the peak rate of runoff from new or existing impervious surfaces subject to vehicular use or storage of chemicals.

d. Section 1.2.3, CORE REQUIREMENT #3; RUNOFF CONTROL, “Retention Facilities”:

i. Requirements for Zone 1 of an Aquifer Protection Area: The City of Renton prohibits the construction of new retention ponds to control the peak rate of runoff from new or existing impervious surfaces subject to vehicular use or storage of chemicals. (Amd. Ord. 4740, 7-19-1999; Ord. 4851, 8-7-2000)

e. Section 1.2.3, CORE REQUIREMENT #3; RUNOFF CONTROL, “Infiltration Facilities”:

i. Requirement for Zone 1 of an Aquifer Protection Area: The City of Renton prohibits the construction of new infiltration facilities to control the peak rate of runoff from new or existing impervious surfaces subject to vehicular use or storage of chemicals.

f. Section 1.2.4, CORE REQUIREMENT #4; CONVEYANCE SYSTEM “(4) For new drainage ditches or channels”:

i. Requirements for Zone 1 of an Aquifer Protection Area: New drainage ditches or channels shall not be employed to convey the runoff resulting from impervious surface that is subject to vehicular use or storage of chemicals.

ii. Requirements for Zone 2 of an Aquifer Protection Area: New drainage ditches or channels may be employed in lieu of a pipe system. A groundwater protection liner may be required for new drainage ditches or channels per the design criteria, and existing drainage ditches or channels reconstructed, to convey the peak runoff from the twenty five (25) year design storm using the design criteria described in the section Liner to Prevent Groundwater Contamination in the introduction to § 4.6, Water Quality Facility Design, and the methods of analysis described in § 4.3.7 in Chapter 4 of the King County Surface Water Design Manual with a freeboard to overflow of 0.5 feet. In addition, new drainage ditches or channels must be demonstrated to convey the peak runoff from the one hundred (100) year design storm without overtopping. (Amd. Ord. 4740, 7-19-1999)

g. Section 1.2.4, CORE REQUIREMENT #4; CONVEYANCE SYSTEM, “Composition”:

i. Requirements for Zone 1 of an Aquifer Protection Area: New conveyance systems shall be constructed in accordance with the pipeline requirements specified in RMC 4-3-050H6a, Pipeline Requirements – Zone 1, of the aquifer protection regulations. Proposed projects shall provide an impervious surface for all new or existing areas that will be subject to vehicular use or storage of chemicals. Said impervious surface shall be

provided with the proper catch basins and a pipeline storm drainage system in order to collect surface water runoff and direct it into the downstream drainage conveyance system.

ii. Requirements for Zone 2 of an Aquifer Protection Area: A groundwater protection liner may be required for new drainage ditches or channels per the design criteria described in the section Liner to Prevent Groundwater Contamination in the introduction to § 4.6, Water Quality Facility Design. Exception: New drainage ditches or channels do not require a groundwater protection liner following the last water quality facility. Proposed projects shall provide an impervious surface for all new or existing areas that will be subject to vehicular use or storage of chemicals. Said impervious surface shall be provided with the proper catch basins and an approved conveyance system in order to collect surface water runoff and direct it into the downstream drainage conveyance system. (Amd. Ord. 4740, 7-19-1999; Ord. 4851, 8-7-2000)

h. Section 1.3.5, SPECIAL REQUIREMENT #5; SPECIAL WATER QUALITY CONTROLS:

i. Requirements for Zone 1 of an Aquifer Protection Area:

Threshold: If a proposed project will discharge runoff from more than one acre of impervious surface that will be subject to vehicular use or storage of chemicals, and:

- (1) Proposes direct discharge of runoff to a regional facility, receiving water, lake, wetland, or closed depression without on-site peak rate runoff control; or
- (2) The runoff from the project will discharge into a Type 1 or 2 stream, or Type 1 wetland, within one mile from the project site.

Requirement: The wet vault size shall be increased by a factor of 1.5 times the size of the wet vault normally required per § 4.6.2 of the 1990 King County Surface Water Design Manual and shall satisfy the wet vault required by § 1.2.3. CORE REQUIREMENT #3: RUNOFF CONTROL in Zone 1 of the aquifer protection area. New or existing retrofitted wet vaults and appurtenances shall meet the pipeline requirements specified in RMC 4-3-050H6a, Pipeline Requirements – Zone 1. (Amd. Ord. 4851, 8-7-2000)

ii. Requirements for Zone 2 of an Aquifer Protection Area:

Threshold: If a proposed project will construct more than one acre of impervious surface that will be subject to vehicular use or storage of chemicals, and

- (1) Proposes direct discharge of runoff to a regional facility, receiving water, lake, wetland, or closed depression without on-site peak rate runoff control; or
- (2) The runoff from the project will discharge into a Type 1 or 2 stream, or Type 1 wetland, within one mile from the project site.

Requirement: Then a wetpond meeting the standards described above shall be employed to treat a project's runoff prior to discharge from the site. A wet vault or water quality swale, as described above, may be used when a wetpond is not

feasible. A groundwater protection liner may be required for wetponds and water quality swales per the design criteria described in the section Liner to Prevent Groundwater Contamination in the introduction to § 4.6, Water Quality Facility Design. (Ord. 4367, 9-14-1992; amd. Ord. 4740, 7-19-1999)

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